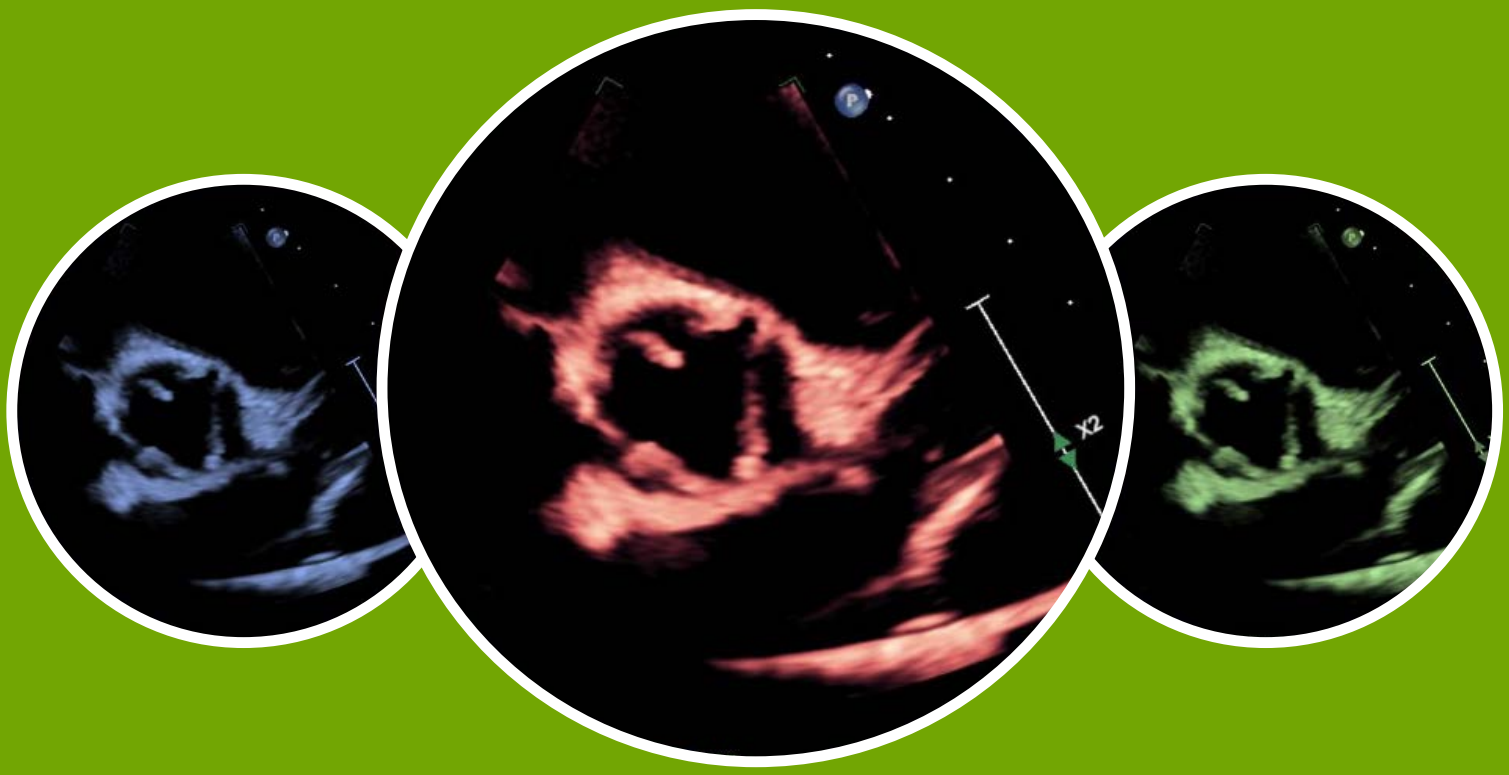
ECHO



MARCH/APRIL 2025

2025 EDUCATION CALENDAR

APRIL 2025

12th Annual Echo Florida

April 5-7, 2025
Disney's Yacht & Beach Club Resort
Orlando, FL

Jointly provided by ASE and the ASE Foundation

APRIL 2025

15th Annual Houston Echo Review and Boot Camp for 2025 Echo Board

April 11-12, 2025
Texas Heart InstituteL

Provided The Texas Heart Institute and in cooperation with ASE.

MAY 2025

5th Annual Advanced Imaging Techniques for Sonographers

May 31-June 1, 2025
Virtual Experience

Jointly provided by ASE and the ASE Foundation

JUNE 2025

4th Annual Echo in Pediatric & Congenital Heart Disease

June 28-29, 2025
Virtual Experience

Jointly provided by ASE and the ASE Foundation

SEPTEMBER 2025

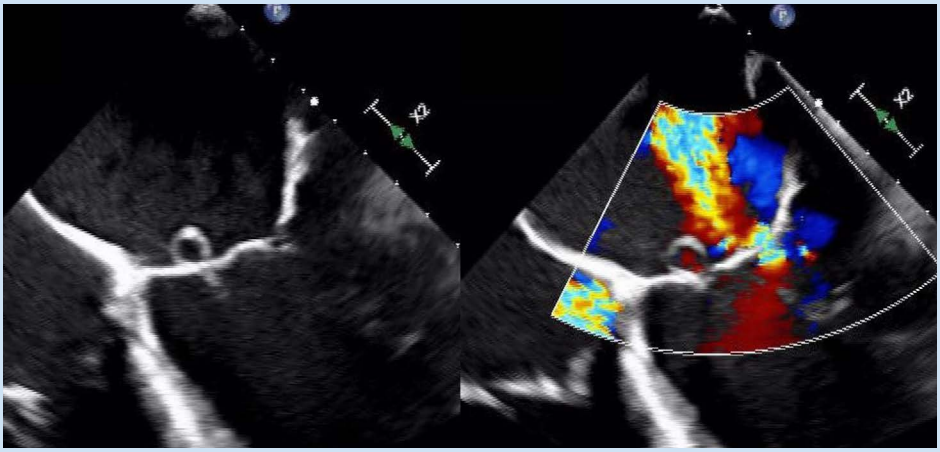
36th Annual Scientific Sessions

September 5-7, 2025
Music City Center (Downtown)
Nashville, TN

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 March and April issues of JASE. ***OnlineJASE.com***



Engaged To The Mitral Valve
Isadora Mathias, MD; Clara I. Angulo, MBA, RDCS; and Bindu Chebrolu, MD, Houston Methodist DeBakey Heart and Vascular Center, Houston, Texas

Contents

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Cover art: "Aortic Love" Steven Kiyokawa, RCS, Starship Children's Hospital, Auckland, New Zealand

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.

President's Message for ***April***

MUSCLING OUT OF MUSCULOSKELETAL INJURY IN CARDIOVASCULAR ULTRASOUND

Contributed by ***Allyson Boyle MHA, ACS, RDCS, FASE****, Chair of the Sonographer Council Steering Committee Atrium Health in Charlotte, NC and* ***Ashlee Davis, BS, ACS, RDCS, RCCS, FASE****, Duke University Hospital Cardiac Diagnostic Unit, Durham, NC*

> "According to the U.S. Bureau of Labor Statistics, musculoskeletal injuries are the leading cause of lost workday injury and illness in the healthcare industry."

According to the U.S. Bureau of Labor Statistics, musculoskeletal injuries are the leading cause of lost workday injury and illness in the healthcare industry. These data are "echoed" in the EU, Asia, and elsewhere. Given that sonographers are the lifeblood of cardiovascular ultrasound, and the exponentially increasing presence of echocardiographers and sonographers in the interventional suite, I asked Allyson Boyle and Ashlee Davis, co-leads for the ASE writing group on musculoskeletal injury, to highlight the topic in this month's President's Page. - **Ted Abraham**

INTRODUCTION

While patient health is the primary focus in cardiovascular ultrasound, the well-being of the healthcare professionals performing these complex procedures—sonographers and physicians—often goes unnoticed. The physical demands of cardiovascular ultrasound, including long hours, awkward body positions, and repetitive motions, can lead to musculoskeletal (MSK) injuries. If not addressed, these injuries can affect the long-term effectiveness of these professionals and the quality of care they provide. Prioritizing their health is critical to ensuring both provider and patient well-being.

PREVALENCE OF MSK INJURIES IN CARDIOVASCULAR ULTRASOUND

Musculoskeletal injuries are a significant concern among sonographers and physicians working in cardiovascular ultrasound. Studies indicate that up to 80% of sonographers experience some form of MSK injury, with the most commonly affected areas being the back, shoulders, neck, and wrists.[1] Research conducted by the American Registry for Diagnostic Medical Sonography (ARDMS) found that 90% of sonographers reported chronic pain related to their work.[2] The physical demands of cardiovascular ultrasound, such as maintaining awkward positions to capture optimal images and the repetitive motions involved in scanning, contribute to strain.[3] Additionally, physicians working in interventional settings, such as the cath lab, are required to wear heavy lead aprons, further increasing the risk of MSK injuries due to prolonged load bearing on the spine and lower extremities.[4]

TYPES OF MSK INJURIES

Sonographers and physicians working in cardiovascular ultrasound are at risk for a range of MSK injuries due to the physical demands of their work.

Shoulder Impingement Syndrome
A common condition caused by **repetitive overhead arm movements and holding the ultrasound transducer at fixed angles for prolonged periods.**[1] This can lead to **inflammation and pain in the shoulder tendons**, significantly impacting work performance.[3]

Carpal Tunnel Syndrome
Frequently observed in sonographers due to **repetitive wrist movements during scanning. The compression of the median nerve in the wrist** can result in **numbness, tingling, and pain**, affecting dexterity and efficiency.[2]

Chronic Neck & Back Pain
Widespread among cardiovascular professionals due to **sustained, unnatural postures during procedures**, such as **leaning over patients or reaching across exam tables** for extended periods.[4] These postures place **significant strain on the spine and neck muscles**, leading to long-term discomfort.

Tendonitis & Repetitive Strain Injuries
Commonly affecting the **wrists, elbows, and forearms** due to the repetitive motions involved in scanning. The **continuous muscle strain** increases the likelihood of chronic inflammation and reduced mobility.[5]

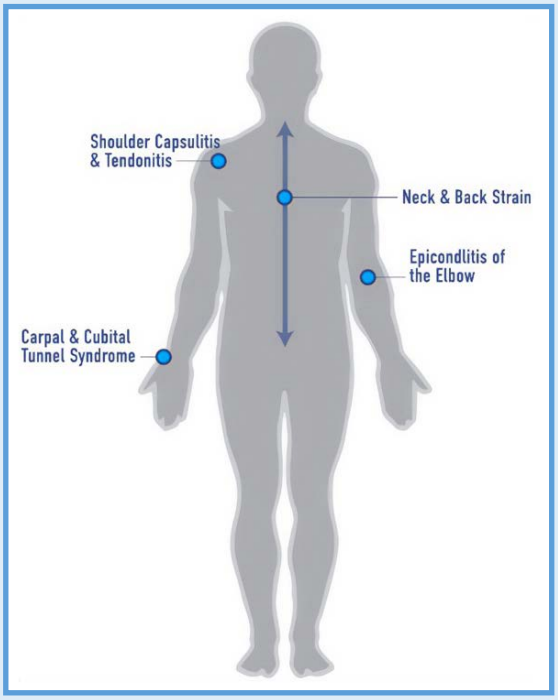
These injuries are exacerbated by the long duration of cardiovascular procedures, particularly in complex cases where professionals spend hours in physically demanding positions. This continuous strain can lead to chronic pain and long-term MSK damage if not properly managed.[6]

FAST FACTS

UP TO 90% of sonographers, physicians, and other medical professionals performing ultrasound examinations work in pain caused by Work Related Musculoskeletal Disorders (WRMSD).

WRMSDs cost employers **$120 BILLION EACH YEAR** in direct and indirect costs.

Source WRMSD Grand Challenge



LONG LEAD WEARING TIMES AND RADIATION EXPOSURE

In the cath lab, sonographers and physicians face additional MSK challenges due to the prolonged use of lead aprons, which are essential for protecting against ionizing radiation. While these aprons effectively minimize radiation exposure, they also add significant weight, particularly straining the back, shoulders, and knees.[4] The extended duration of wearing heavy aprons during complex procedures exacerbates MSK strain, contributes to fatigue, and makes it more difficult to maintain proper posture throughout the procedure.[7]

Though radiation exposure is well-controlled with protective gear, the physical toll of wearing heavy lead for prolonged periods is often overlooked. Maintaining a forward-leaning position for extended hours increases lower back strain, leading to additional discomfort and fatigue.8 Without proper ergonomic considerations or periodic relief strategies, chronic pain and long-term MSK injuries become significant risks for cath lab professionals.

PREVENTATIVE MEASURES AND SOLUTIONS

Preventing MSK injuries in sonographers and physicians requires a multifaceted approach, focusing on ergonomics, training, and self-care.

1. **Ergonomic Adjustments:** Key to reducing strain are adjustments to the ultrasound room and cath lab. Professionals should use adjustable examination tables and ultrasound equipment with angles that minimize awkward body positions. Chairs should provide proper lumbar support to reduce strain on the back and neck.
2. **Proper Body Mechanics Training:** Professionals should receive training on body positioning, movement efficiency, and posture to reduce the risk of injury from repetitive motions and awkward positions.
3. **Frequent Breaks and Stretching:** Incorporating regular breaks and stretching routines helps alleviate muscle fatigue and prevent stiffness. Stretching areas prone to strain, such as the shoulders, back, and wrists, can improve comfort and flexibility.
4. **Physical Therapy and Strengthening Exercises:** Regular physical therapy or strengthening exercises can help improve posture and muscle endurance, which further reduces the risk of MSK injuries.
5. **Wearable Technology:** Innovative solutions, such as posture sensors or exoskeletons, can monitor and provide feedback on body alignment during procedures. This real-time feedback can help ensure that professionals maintain safer postures and reduce the risk of strain.

COLLABORATING FOR CHANGE

To effectively mitigate the risks of MSK injuries in cardiovascular ultrasound, systemic change is essential. Healthcare institutions must acknowledge the physical demands of the profession and the high risk of injury among sonographers and physicians. Administrators should prioritize workforce well-being by implementing comprehensive ergonomics training, proper posture and body mechanics education, and regular health assessments to detect early signs of strain.[1]

Collaboration between ultrasound professionals, ergonomics experts, and healthcare organizations can lead to safer work environments. Key interventions include:

- Optimized equipment with adjustable settings to reduce strain.
- Scheduled breaks to minimize repetitive stress and fatigue.
- Access to physical therapy and rehabilitation resources to address MSK concerns proactively.[3]

ERGONOMIC ADJUSTMENTS	PROPER BODY MECHANICS	FREQUENT BREAKS AND STRETCHING	PHYSICAL THERAPY	WEARABLE TECHNOLOGY
• Use adjustable exam tables and ultrasound equipment to minimize awkward postures. • Ensure chairs provide proper lumbar support to reduce back and neck strain.	• Educate professionals on posture, movement efficiency, and injury prevention.	• Implement regular breaks and targeted stretching to prevent stiffness and fatigue.	• Engage in exercises to improve posture, muscle endurance, and reduce MSK injury risk.	• Utilize posture sensors or exoskeletons for real-time feedback on body alignment.

By proactively addressing these issues, healthcare organizations can support the long-term health of professionals while maintaining high-quality patient care.[2]

CONCLUSION

Addressing MSK injury risks in cardiovascular ultrasound is essential to safeguarding the health of sonographers and physicians. The physical demands of long hours, awkward postures, and heavy lead aprons can lead to chronic strain and long-term injuries. Raising awareness and implementing proactive measures—including ergonomic equipment, specialized training, and regular health assessments—can significantly reduce injury risk and enhance workplace safety. By prioritizing the well-being of ultrasound professionals, healthcare organizations can ensure sustained high-quality patient care while fostering a healthier, more resilient workforce.

This text also appears in the April issue of JASE OnlineJASE.com

Theodore P. Abraham,
MD, FASE
ASE President

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Why I Chose to Become a Mentor in

ASE's Mentor Match Program

*Contributed by **Lindsey Thomas, BS, RDCS, RVT, FASE, SSM,** Health Dean Medical Group, Madison, WI*

A **CO-WORKER** and I were recently reminiscing on our first year as new graduates together. Back in 2013, we were freshly graduated working in a high volume, faced paced cardiovascular department at a large level one hospital in the Midwest. We were the youngest in the department with the least amount of experience. That first year was spent questioning our abilities and knowledge. Thankfully, there were staff sonographers and lead sonographers who walked the fine line of understanding our lack of confidence, while simultaneously (and metaphorically) kicking us out of the nest to watch us fly off on our own.

Twelve years later, we realized we are now the sonographers the students and new graduates looked to for guidance. We are now the people who instruct, give advice, and help grow the confidence of the next generation. There's a debt of gratitude from those first years that still persists in me to today, which is why it was a very easy decision to be a part of the ASE Mentor Match program. It has provided me with opportunities to grow my leadership and mentorship skills, while developing new relationships within the sonography community.

What I think has surprised me the most is that although I am a Mentor, a mutual relationship can lead to growth and learning from both parties.

Signing up and selecting a Mentee

The application to become a mentor was an easy process. It resembled a job application, where I submitted my resume and listed my areas of expertise. There were a few mentees who expressed interest, but the first one who reached out was my current mentee, Angie. When looking at her profile, I could tell we were similarly matched as far as experience and overall skills. Angie was looking for someone to help guide her with Pediatric Echocardiography and public speaking skills. With my previous experience as a Clinical Education Coordinator at a sonography school, I felt I could help grow her skills with the mentorship program. I accepted her as my mentee, and so began our new found relationship!

Although I was supporting Angie as a mentor, ASE reciprocated support of me through the Mentor Match website. I worked through several online courses offered for free on the website to enhance my mentorship

skills. Although I was used to mentoring students through sonography school, these courses helped to fine tune my verbiage. The courses also helped me to adjust and hone my meetings and objectives with Angie, in relation to goals and expectations. Although we would spend time chatting about our lives, we still worked through Angie's goals in a timely manner. We discussed some challenges her goals may bring and how she can work through them. I also learned that Angie had the opportunity to take similar mentoring courses for free as well! Another perk of joining the Mentor Match program.

Our first meeting

The first meeting was over the phone. I was unexpectedly home alone with my two young kids, so there were a lot of curious questions like "who is your friend you're talking to mommy?" and "can you be done yet?" (they are 3 and 5 and very impatient!). Through the interruptions, Angie and I talked about ourselves, our lives, our interests and finally our careers. We both are very naturally bubbly people, so our conversation flowed easily. After about 45 minutes of chatting, we said our goodbyes and set off to explore more on the ASE Mentor Match website to prepare for our next meeting.

Communication and Time Commitment

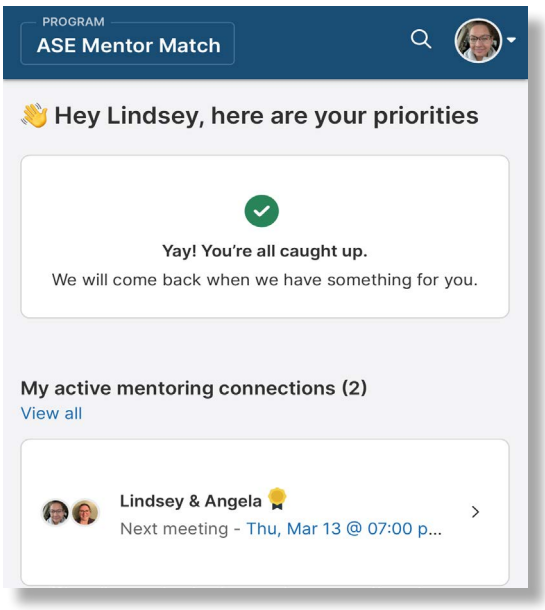
If there was a theme to describe our communications, it would be perseverance. After our first meeting, Angie and I decided that every other Thursday night we would call and check-in. Although our first call went without a hitch, the subsequent meetings required a lot more flexibility and other methods of communication. One week Angie had family obligations, so we adjusted to text/email. The following meeting, I had family obligations and we moved the meeting to the following week. Unfortunately, my house is in the middle of nowhere Wisconsin with terrible cellular service, and I was constantly dropping Angie's call. We joked over text that everything would be alright, and that we could continue our conversation via email. We both understood that sometimes life gets in the way of our best intentions, but with perseverance we can make it worthwhile in the end.

Angie did a wonderful job of laying out her goals and expectations on the Mentor Match website. It is easy for me to find, review, and refresh my memory on what she has planned for her future. As a mentor, the website is extremely easy to navigate and reference very quickly to meet Angie's expectations for our meetings. I can also edit her goals and assign tasks to her to challenge and excite her. I would check the website every day or every other day for 5-10 minutes and plan for the next meeting. Our meetings would last 30-45 minutes, so in all the time commitment is very low in comparison to being a clinical instructor or preceptor.

Looking to the future

Although the mentorship program "ends" on June 3, 2025, I have a strong feeling that Angie and I will continue to stay in touch. At our meeting at the end of February, we got on the topic of reading. We are both avid readers, and Angie recommended a few non-fiction books on leadership. I'm hoping they will be available from my local library so I can begin reading them as well. I have already seen such determination and progress in the few short months of our communication. It has been an honor to play a small part in her life!

In closing, what I think has surprised me the most is that although I am a Mentor, a mutual relationship can lead to growth and learning from both parties. If you are looking for more information about the Mentor Match program, you can contact ASE by email at MentorMatch@ASEcho.org.



Sonographer

VOLUNTEER OF THE MONTH

Congratulations

Clara I. Angulo, ACS, MBA, FASE

Houston Methodist DeBakey Heart and Vascular Center
Houston, TX

Q&A

When and how did you get involved with cardiovascular ultrasound?

While working as a medical assistant in an OB/Gyn practice, I often watched the physician perform ultrasounds. Eager to deepen my knowledge, I researched and toured various ultrasound schools, including the cardiovascular program at Alvin Community College in Alvin, TX. At that time, Ms. Jessica Murphy, the program director, demonstrated both professionalism and kindness, providing insights into the various programs available. I quickly became captivated by the cardiac ultrasound program. As a result, I applied, was accepted, and graduated successfully in 2006.

What is the name and type of facility/ institution at which you work, and what is your current position?

After completing the ultrasound program, I joined the Houston Methodist DeBakey Heart and Vascular Center, where I had the privilege of working under Marti McCulloch's mentorship. My role has evolved significantly over time. Achieving Fellowship status with the ASE and earning my Advanced Cardiac Sonographer credential has been essential for my professional growth. A key component of my position involves participating in cardiovascular imaging research projects and drafting initial echo reports. Presently, I am assisting in research initiatives led by Dr. Sherif Nagueh and Dr. William Zoghbi.

Additionally, I earned my MBA from Rice University, focusing on healthcare. The knowledge and skills I gained during my studies have been crucial for another important aspect of my role. I also lead process improvement initiatives aimed at enhancing our department's operational efficiency. I have overseen projects aimed at reducing unnecessary repeat echocardiographic tests. Recently, I collaborated with our

> **“Through my volunteer work, I can share my expertise, learn new skills, build relationships, and assist others. I truly believe that volunteering enhances our profession and strengthens our community.”**

medical directors, Dr. Sherif Nagueh and Dr. Karla Kurrelmeyer, on a project aimed at decreasing the average turnaround time for echo reports categorized as "as soon as possible." We successfully reduced the average turnaround time by nearly three hours, which has positively impacted our department's operational success, something I take great pride in.

When and how did you get involved with the ASE?

I joined ASE in 2005 as part of my school's initiative. It was recommended to improve our learning experience and connect with the community. I have continued my membership over the years because ASE offers valuable educational resources to our community and creates opportunities for members to develop friendships, share knowledge, and actively participate in community projects.

Why do you volunteer for ASE?

I chose to volunteer with ASE because I connect with its mission. It encompasses all professionals engaged in echocardiography, including physicians and sonographers, while advocating for innovation and excellence in patient care. Through my volunteer work, I can share my expertise, learn new skills, build relationships, and assist others. I truly believe that volunteering enhances our profession and strengthens our community.

What is your current role within ASE? In the past, on what other committees, councils or task forces have you served and what have you done with the local echo society?

I have been involved as a volunteer with ASE, contributing to several committees, including the Research committee, Ethics Bylaws committee, and the Nominations committee. For three years, I served as an abstract grader. Additionally, I have presented at ASE conferences multiple times and have had my work published in CASE and JDMS. At present, I feel privileged to be a member of the ASE Leadership Academy Cohort 4, and I aspire to apply the skills I acquire for the betterment of our community.

What is your advice for members who want to become more involved in their profession or with the ASE?

I highly encourage sonographers and fellows to become members of ASE. This organization establishes the practice standards and guidelines for the ultrasound profession. ASE presents numerous opportunities for all members to connect with the community, offering valuable networking, avenues for professional growth, and chances for mentorship. Engage and begin enhancing your credibility in the field.

> "As sonographers, we must recognize that AI serves as a supportive tool, not a substitute for our clinical judgement."

What is your vision for the future of cardiovascular sonography?

Technology is advancing rapidly, and it's exciting to consider how AI will influence our field further. Automation of measurements, enhancement of image quality, increased diagnostic precision, and accelerated interpretation will streamline workflows, enabling providers to recognize disease patterns more effectively and enhance patient care. It is essential that these algorithms undergo thorough and robust clinical validation to guarantee their safety.

As sonographers, we must recognize that AI serves as a supportive tool, not a substitute for our clinical judgement. We should apply our critical thinking skills to understand how to interpret AI-generated results along with their potential limitations, as there are still areas where human insight is indispensable.

Cardio-Oncology

SIG Case Competition Winner Featured in CASE

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

All submissions showcased remarkable dedication to the field of cardio-oncology screenings with focus on the benefits of echocardiography.

THE ASE Cardio-Oncology Special Interest Group is thrilled to announce Alexander Hurtado, MD, Samuel Luebbe, MD, and Nausheen Akhter, MD, as the winning team of our Unlock the CASE competition! The winning submission was featured on the CASE homepage for several months, and is now archived.

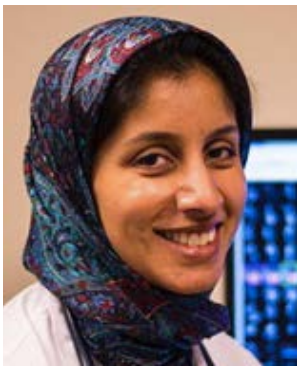
All submissions showcased remarkable dedication to the field of cardio-oncology screenings with focus on the benefits of echocardiography. The winning case demonstrated a 32-year-old patient with rare extraskeletal primary osteosarcoma, which presented as a large mediastinal mass infiltrating the right atrium.

Thank you to all participants for sharing your fascinating cases and contributing to the sharing of and progress of science and screening for the cardio-oncology field.

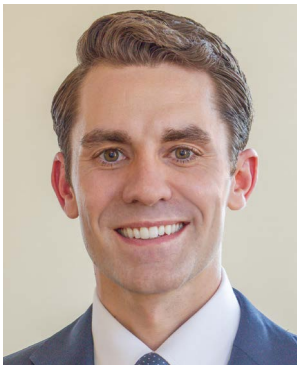
Please join the ASE Cardio-Oncology SIG by logging in to your ASE Portal and updating your profile. Stay tuned for more exciting opportunities to share your findings and help us improve patient care!

The winning team of our Unlock the CASE competition!

Alexander Hurtado, MD



Nausheen Akhter, MD



Samuel Luebbe, MD

The ASE and Vascular Ultrasound:

Perspective from the CAVUS Chair

Contributed by ***Matthew Vorsanger, MD, RPVI, FASE****,*
NYU Grossman School of Medicine, New York, NY

As the professional home for cardiovascular ultrasound, ASE is the thought leader and innovator in this space.

AS THE CHAIR of ASE's steering committee on Circulation and Vascular Ultrasound (CAVUS), it is a true pleasure to be able to highlight some of the important work being conducted in this area by ASE. As the professional home for cardiovascular ultrasound, ASE is the thought leader and innovator in this space.

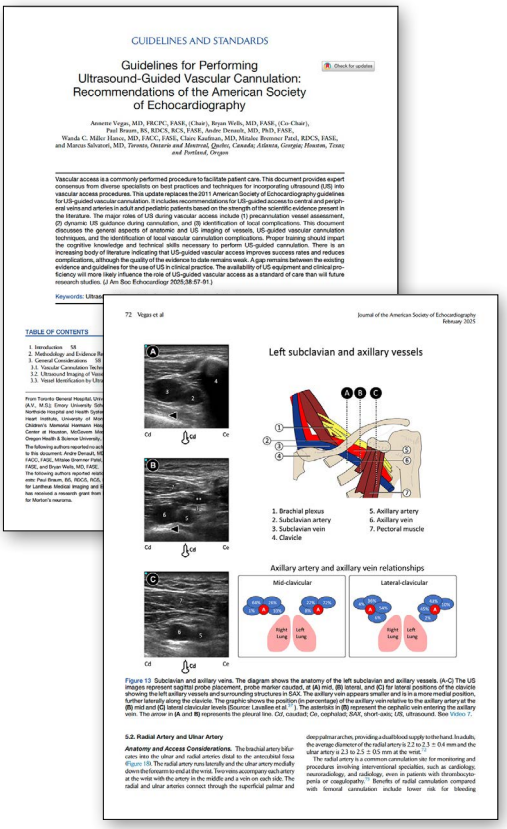
Recognizing the integral aspect of vascular ultrasound in the safety and efficacy of vascular cannulation, ASE has published a formal guideline on this topic in February 2025, the "Guidelines for Performing Ultrasound-Guided Vascular Cannulation", chaired by Dr. Annette Vegas and co-chaired by previous CAVUS chair, Dr. Bryan Wells.[1] This document provides much needed guidance for practitioners on techniques to improve success rates and decrease complications of vascular cannulation, while highlighting evidence gaps and areas for future investigation.

It is also anticipated that a forthcoming update to ASE's Chamber Quantification Guidelines, chaired by Dr. Roberto Lang and co-chaired by Dr. Luigi Badano will provide much needed clarity on normative values for aortic dimensions on echocardiography, a topic of great importance to imagers, clinicians, and patients.

The needs of clinical stakeholders in the field of vascular ultrasound for practical guidance can also not be underestimated. Two members of the CAVUS steering committee have recently published pieces in *Echo* magazine addressing these very needs. Melissa Warren's article on the importance

of standardization in the technical aspects of the carotid duplex ultrasound examination addresses a pervasive need in the field of vascular ultrasound, which will hopefully receive attention in future ASE publications. Stavros Agorastos' article on the importance of the dual-modality echocardiography-vascular ultrasound laboratory can serve as a blueprint and a justification for physicians and sonographers looking to blend these two modalities in their practice. Interested readers are directed to these two excellent articles for further information.

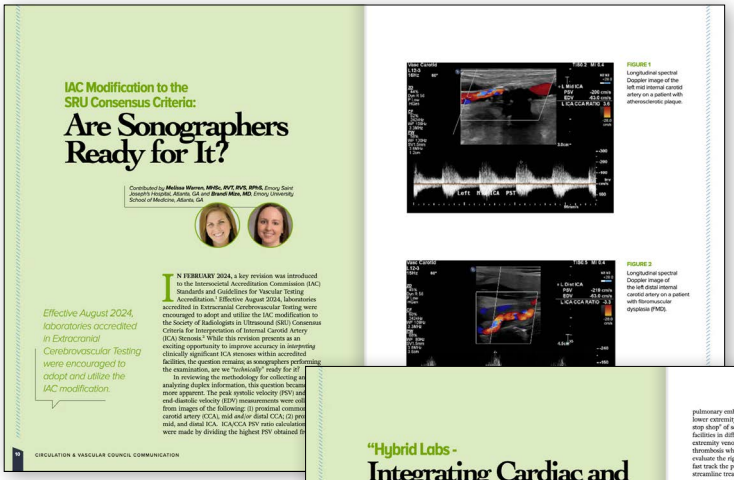
And as ASE celebrates its 50th anniversary with its upcoming Scientific Sessions in Nashville, CAVUS is thrilled to be part of the engaging, innovative, and interactive educational offerings being planned, led by the CAVUS Scientific Sessions representative, Dr. Aaron Aday. Stay tuned for more!


GUIDELINES AND STANDARDS

Guidelines for Performing Ultrasound-Guided Vascular Cannulation: Recommendations of the American Society of Echocardiography

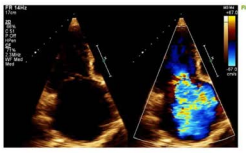
Left subclavian and axillary vessels

Axillary artery and axillary vein relationships


IAC Modification to the SRU Consensus Criteria:

Are Sonographers Ready for It?

"Hybrid Labs - Integrating Cardiac and Vascular Ultrasound"

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Decreasing the Amount of

Cardiac Intensive Care TTEs

*Contributed by **Matthew Pierce, MD, MBA**,*
North Shore University Hospital, Manhasset, NY

Is it really essential to order daily TTEs on someone with a pericardial drain when there's been no clinical change?

I'LL ADMIT IT: as a cardiac intensive care unit (CICU) attending, I order too many transthoracic echocardiograms (TTEs). I know this because I often am told as much by the echo attendings with whom I work. When they are unable or perhaps too frustrated to tell me in person, they are considerate enough sometimes to include in their echo reports how many echos the patient has had over the last several days or weeks. (As if any of that would convince any cardiologist that they should order less!).

However, they're not wrong. Is it really essential to order daily TTEs on someone with a pericardial drain when there's been no clinical change? Does anyone really have a high suspicion that an RV that was down a week ago and needed inotropic support is any better or worse now that the inotropes can't be weaned off? There are many other instances that come to mind where another test or imaging study in the absence of a clinical change may not be the answer, especially when one takes into account the burden it places on other technicians, providers and overall healthcare resource utilization.

But the reality is that no matter how persuasive an argument I or anyone makes about ordering less TTEs, there will be no change anytime soon. The reasons for this are multifactorial, ranging from defensive medicine to ingrained practices to over-reliance on testing compared to clinical acumen to make diagnoses, amongst others. So how then can we temper and even transform this culture of having the echo lab come and perform multiple TTEs on the same

patient and decrease the burden that we as cardiac critical care providers place on them?

This is where, perhaps, cardiologists and CICU attendings can learn from their MICU and even ED colleagues and place more emphasis on using point of care ultrasound (POCUS). These studies are becoming more ubiquitous, and in the hands of a properly trained provider can be invaluable. I think this certainly holds true for more simple assessments such as evaluation of a pericardial effusion or ventricular function, especially if there is a baseline done by an echo tech for comparison (more complex assessments like valve area, regurgitant volume, etc. are probably not ideal for POCUS). Cardiologists, many of whom are echo boarded, are certainly qualified to make these basic echo assessments.

Despite this, I find that POCUS is less utilized by cardiologists, even in intensive care settings. I think this is mainly cultural – cardiology training places more emphasis on interpreting rather than performing echos and cardiologists, including their trainees, are used to having a tech at our beckon call to perform them for us. And that carries over to daily practice in this era where patients are sicker and providers are asked to see more of them. That leads to providers all feeling over-extended and crunched for time. When someone feels that way, the bottom line is it's just easier to have someone else do the echo for you and read it, especially if that's what you're used to.

One potential solution is to train other providers on the caregiving team at the very least to perform POCUS studies and potentially to interpret them. This is true not only for CICU but also for other intensive care settings and perhaps even the med/surg floors. There have been many publications citing the feasibility and benefits of training intensive care physicians in the art of performing and interpreting bedside POCUS exams. Coupled with a proliferation of training courses administered by the various critical care societies, it is not uncommon to see more and more attending physicians and even trainees that are more facile with echo and that incorporate echo into their bedside assessment of patients both inside and outside the intensive care unit. What is much less common is seeing that same adoption of POCUS by ancillary providers such as advanced practice providers (APPs) and nurses.

Bedside echo, therefore, is not only a powerful tool in helping providers assess and care for their patients but also one that can be used to help decrease the ever-increasing burden of TTEs

Training non-physicians to perform and interpret bedside ultrasounds is a natural extension of current practices in many settings. In the intensive care units where I work, it is not uncommon for nurses to use ultrasound to place IVs in patients with difficult access. It is also the nurses that are experienced with this that are showing and training other nurses how to do this. It is not much of stretch to imagine training this same population to obtain a subcostal or parasternal long view and incorporating that into their bedside assessment at the beginning of each shift, even if initially this is coupled with a more experienced provider there to help with a real time interpretation. As more attendings use POCUS in their bedside assessments, the dedicated critical care APPs see that this is an integral part of patient care and want to add this skill to their arsenal and make POCUS a part of their assessments.

Bedside echo, therefore, is not only a powerful tool in helping providers assess and care for their patients but also one that can be used to help decrease the ever-increasing burden of TTEs placed on echo labs, especially by CICUs. Training APPs and nurses to perform these studies is one avenue both to augment their training and also have a more balanced critical care team that can offload the responsibility of performing and interpreting studies from the attending. The training infrastructure that already exists for physicians can be used for these other providers, and for many of them it is a natural extension of what they already see and do on a daily basis. In other words, why aren't more of us interested in training our interested colleagues?

Shaping the Future of Tricuspid Valve Interventions:

The Essential Role of Echocardiography

*Contributed by **Enrique Garcia-Sayan, MD, FASE**, Baylor St. Luke's Medical Center, Texas Heart Institute, Houston, TX; **Andrew C. Peters, MD, FASE**, Thomas Jefferson Hospital, Philadelphia, PA; **Billy Cathey, RDCS**, Barnes Jewish Hospital, St. Louis, Missouri*



The integration of 3D echocardiography, MPR, and emerging technologies like 3D ICE not only enhances procedural success but also improves patient safety.

THE LANDSCAPE OF tricuspid valve (TV) interventions has evolved rapidly since its inception in 2015. The growing recognition of severe tricuspid regurgitation (TR) as a major contributor to morbidity and mortality has fueled enthusiasm for transcatheter therapies. The increasing availability of devices and clinical trials has led to significant advances in the field, with tricuspid transcatheter edge-to-edge repair (T-TEER) and transcatheter tricuspid valve replacement (TTVR) devices receiving FDA approval in 2024. Since isolated TV surgery has not demonstrated improved survival compared to medical therapy and is associated with significant morbidity, transcatheter interventions may present a promising alternative for high-risk patients.[1]

TR is broadly classified into two types: primary TR and secondary TR (STR). Primary TR results from leaflet pathology due to conditions such as myxomatous degeneration, acquired issues affecting the integrity of the leaflet tissue (e.g., endocarditis, carcinoid, or trauma), or congenital abnormalities. STR, which accounts for the majority of cases encountered in clinical practice, arises from right ventricular dilation and leaflet tethering linked to left-heart disease (ventricular-STR) or tricuspid annular dilatation commonly seen in atrial fibrillation (atrial-STR). Additionally, TR associated with cardiac implantable electronic devices is now considered a separate category.[2]

Two primary transcatheter strategies have emerged for the management of TR, T-TEER, and TTVR, with investigational annuloplasty devices also showing promise. Early approaches adapted left-sided devices, such as the Edwards Mitralign™ system and Abbott MitraClip™, for tricuspid repair. However, dedicated tricuspid devices like the Edwards PASCAL™ system (CLASP trial) and Abbott TriClip™ (TRILUMINATE trial) for T-TEER, as well as the Edwards Evoque™ valve (TRISCEND trial) for TTVR, have significantly advanced the field, and the latter two are now commercially available.

The complex anatomy of the TV—characterized by thin and often more than three leaflets, with variable chordal attachments and papillary muscle anatomy—renders high-quality imaging essential for successful intervention. Moreover, TR grading has evolved to include an expanded classification for severe TR into massive and torrential, acknowledging that many patients present with disease severity beyond previous classification schemes. Transthoracic echocardiography (TTE) and transesophageal echocardiography (TEE) are indispensable for procedural planning, guiding interventions, and assessing outcomes. Structural heart imagers, echocardiographers, and sonographers play a critical role in evaluating and managing these patients, as technological advancements demand comprehensive two-dimensional (2D) and three-dimensional (3D) imaging of the TV.

Transthoracic Imaging of the Tricuspid Valve

TTE is pivotal in screening patients for T-TEER by evaluating TV anatomy, TR severity, right ventricular morphology and function, and pulmonary artery[3]. A comprehensive approach that utilizes multiple echocardiographic views—such as the right ventricular inflow tract, parasternal short axis, four-chamber, and subcostal views—is essential for accurate assessment. Centering the TV within the imaging sector optimizes resolution, while techniques such as left lateral decubitus positioning, breath-holding, and adjusting the transducer to lateral windows further enhance image quality.

Biplane imaging enables simultaneous visualization of the TV in orthogonal planes, facilitating precise assessment of leaflet morphology and coaptation. Capturing images both with and without color Doppler is necessary for proper TR quantification. Ensuring the color box is wide enough to encompass the entire regurgitant jet is important. In cases of eccentric jets, off-axis imaging may be required for improved visualization. For 3D TTE, obtaining a high-quality 2D image is fundamental. A focused four-chamber view of the TV typically yields optimal results, although acquiring multiple views is recommended to ensure accuracy. The use of 3D zoom enhances spatial resolution and frame rates, offering superior visualization of leaflet anatomy and coaptation gaps ***(Figure 1)***.[4]

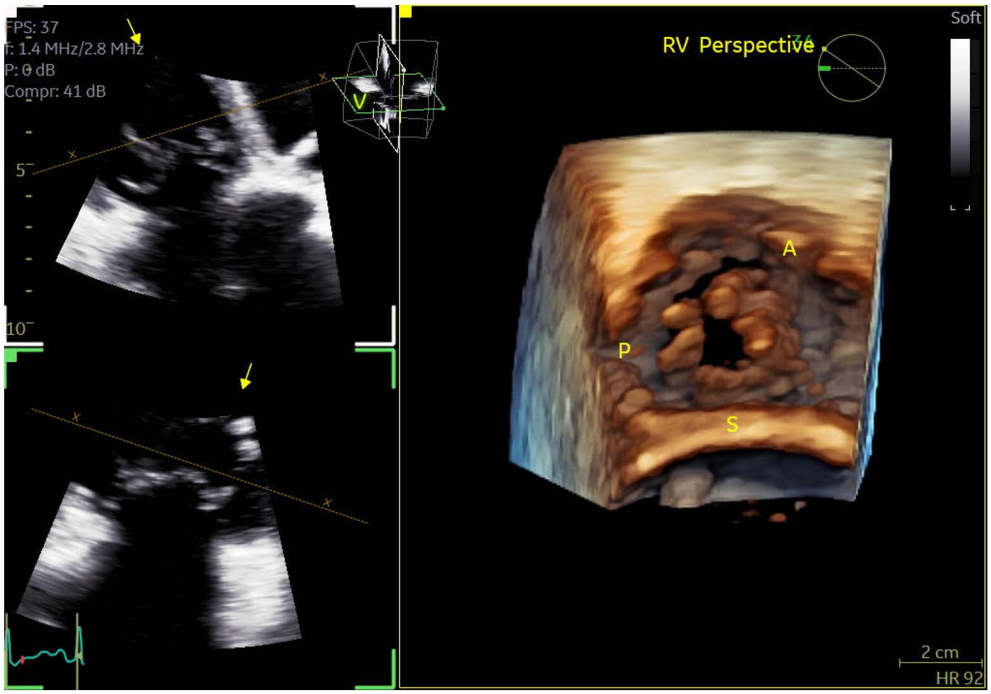


FIGURE 1

3D zoom image acquired with transthoracic echocardiography from the apical four-chamber view. The malcoaptation of the posterior and septal leaflets away from the anterior is clearly shown.

Abbreviations: A=Anterior Leaflet; P=Posterior Leaflet; S=Septal Leaflet

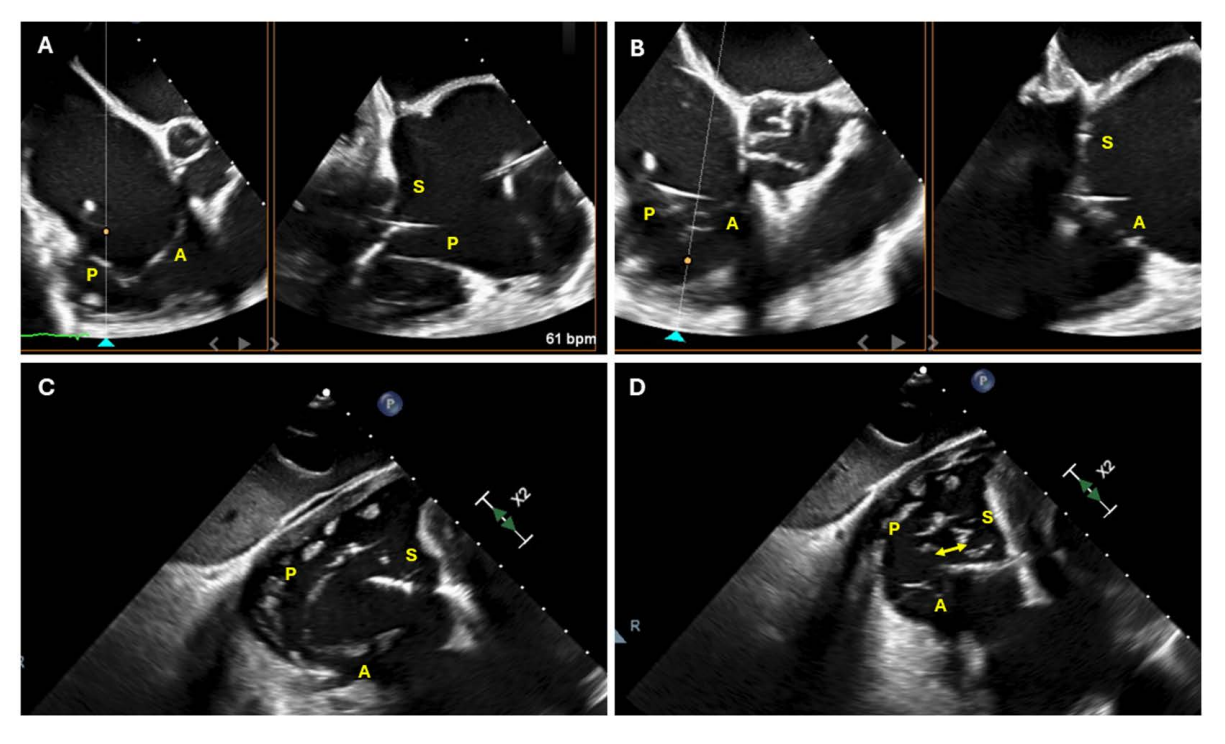


FIGURE 2

Panel A shows biplane imaging in the right ventricular inflow view through the posterior leaflet and panel B through the anterior leaflet at 60 degrees. Panel C shows a transgastric view with the leaflets open and panel D a systolic frame showing malcoaptation between the septal and anterior leaflets (arrow).

Abbreviations: A= anterior leaflet; P= posterior leaflet; S= septal leaflet.

Transesophageal Imaging for Diagnosis and Procedural Planning

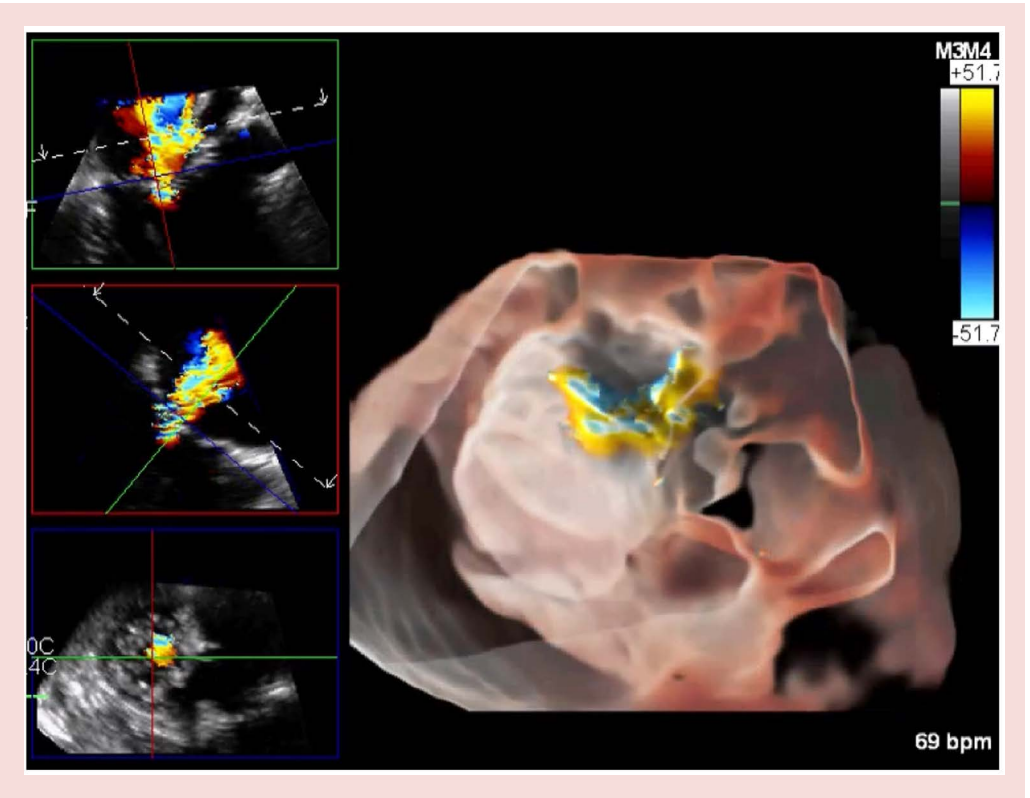
TEE is instrumental for both procedural planning and intra-procedural guidance in transcatheter TV interventions. Given the complex morphology of the TV and its far-field location, achieving optimal imaging requires a methodical approach.[5] Multiplane imaging at varying depths and angles is necessary for a comprehensive assessment of TV anatomy. The right ventricular inflow–outflow view, typically obtained at 60–90 degrees with biplane imaging, permits visualization of all three leaflets, thereby facilitating precise localization of the pathology and measurement of tenting height and coaptation gaps ***(Figure 2 A, B)***. Advancing the probe to the gastroesophageal junction can further improve imaging by reducing interference from left-heart structures and devices, which enhances both 2D and 3D imaging quality.

Transgastric short-axis views at 30 degrees allow simultaneous evaluation of all three leaflets and are critical for assessing valve morphology, chordal insertions, and coaptation gap ***(Figure 2 C, D)***. Utilizing color compare mode or simultaneous display yields important information regarding the location and shape of the regurgitant jet. 3D images can be acquired from multiple windows. It is customary to orient the rendered image to mimic the transgastric short-axis view, with the aortic valve positioned at the five o'clock location. In addition, 3D color Doppler aids in quantification via vena contracta area measurement ***(Figure 3)***. Multi-beat acquisitions can enhance frame rates while maintaining a broad sector width and spatial resolution.

Echocardiographic Guidance for Transcatheter Tricuspid Valve Interventions

Echocardiographic guidance is central to the success of transcatheter TV interventions, whether utilizing TEE or 3D intracardiac echocardiography (ICE), an emerging and rapidly growing modality.

During T-TEER, echocardiographic guidance with 2D and 3D multi-planar reconstruction (MPR) ensures safe and precise navigation of the device below the TV leaflets, with its arms aligned perpendicular to the coaptation line, and avoiding chordal



structures ***(Figure 4)***. The anterior-septal leaflet grasping zone is generally preferred, as grasping in other regions may result in a suboptimal reduction of TR. Optimal leaflet grasping is confirmed by assessing the degree of leaflet capture and the subsequent reduction in TR. In some cases, additional devices may be necessary to achieve effective regurgitation reduction.[6]

For TTVR using the Evoque™ valve, echocardiographic guidance ensures coaxial alignment, proper placement of the capsule gap below the annulus and above the papillary muscles, and avoidance of chordal entanglement.[7] Once the nine anchors are exposed, each must be systematically evaluated using 3D MPR to confirm secure leaflet insertion before device deployment ***(MPR "spin", Figure 5)***.

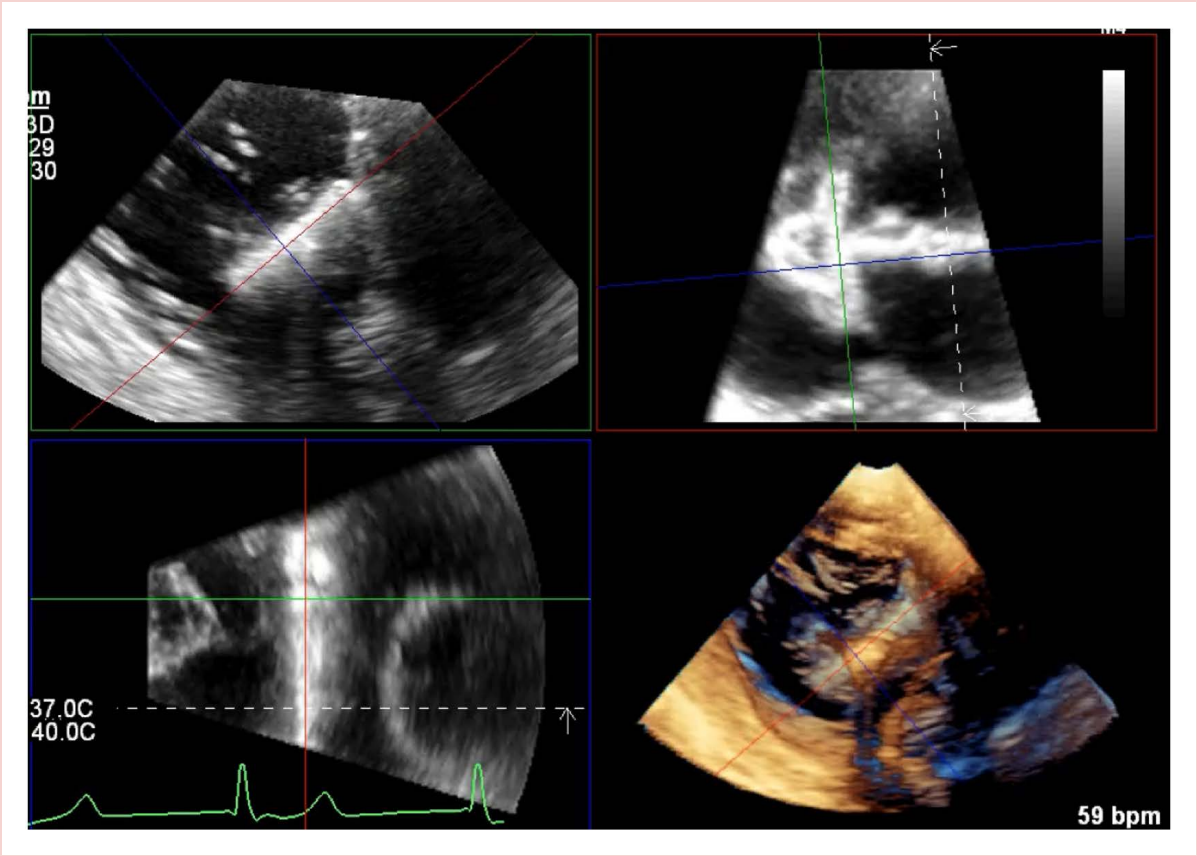
A common challenge in TEE imaging for TV interventions is acoustic shadowing from delivery systems or other anatomical or prosthetic structures, which can obscure the visualization of the leaflets. The introduction of 3D ICE has addressed this limitation by offering enhanced visualization without necessitating general anesthesia. ICE can supplement TEE when imaging is suboptimal or contraindicated. Its role is expanding as interventional echocardiographers increasingly incorporate this modality into structural heart procedures.[8]

FIGURE 3

Live 3D color acquisition of the tricuspid valve. The X (green) and Y (red) planes are aligned with the regurgitant jet, while the orthogonal Z (blue) plane is advanced toward the vena contracta. In this plane, the location and shape of the regurgitant jet can be determined for procedural planning, and the vena contracta area can be measured for quantitation of severity.

Post-Procedural Assessment and Long-Term Monitoring

Immediate post-procedure imaging confirms proper device positioning, leaflet stability, and TR reduction. Long-term surveillance—primarily through serial TTE, with TEE performed when necessary—monitors for residual regurgitation, leaflet dysfunction, or device-related complications such as thrombosis or endocarditis. Serial monitoring of right ventricular function is important, as TR correction can unmask underlying dysfunction due to acute afterload mismatch. Advanced techniques such as strain imaging and 3D echocardiography provide additional insights into right ventricular remodeling and function following the intervention.



Conclusion

The evolution of transcatheter therapies for TR has underscored the essential role of echocardiography in patient selection, procedural guidance, and post-intervention assessment. As these therapies continue to advance, structural imagers, interventional echocardiographers, and sonographers are indispensable in ensuring optimal outcomes through meticulous imaging. To effectively guide these interventions, practitioners must possess a comprehensive understanding of cardiac anatomy and pathology, the devices and procedural steps involved, as well as proficiency with advanced imaging modalities. The integration of 3D echocardiography, MPR, and emerging technologies like 3D ICE not only enhances procedural success but also improves patient safety. With a growing emphasis on transcatheter solutions for TR, the expertise of the heart team—including skilled echocardiographers—remains paramount in shaping the future of TV interventions.

FIGURE 4

Live 3D MPR during transcatheter edge-to-edge repair of the tricuspid valve, obtained from a trans gastric window. The red plane is aligned with the device arms at the intended grasping site and perpendicular to the coaptation line, which can facilitate a “grasping view”.

The integration of 3D echocardiography, MPR, and emerging technologies like 3D ICE not only enhances procedural success but also improves patient safety.

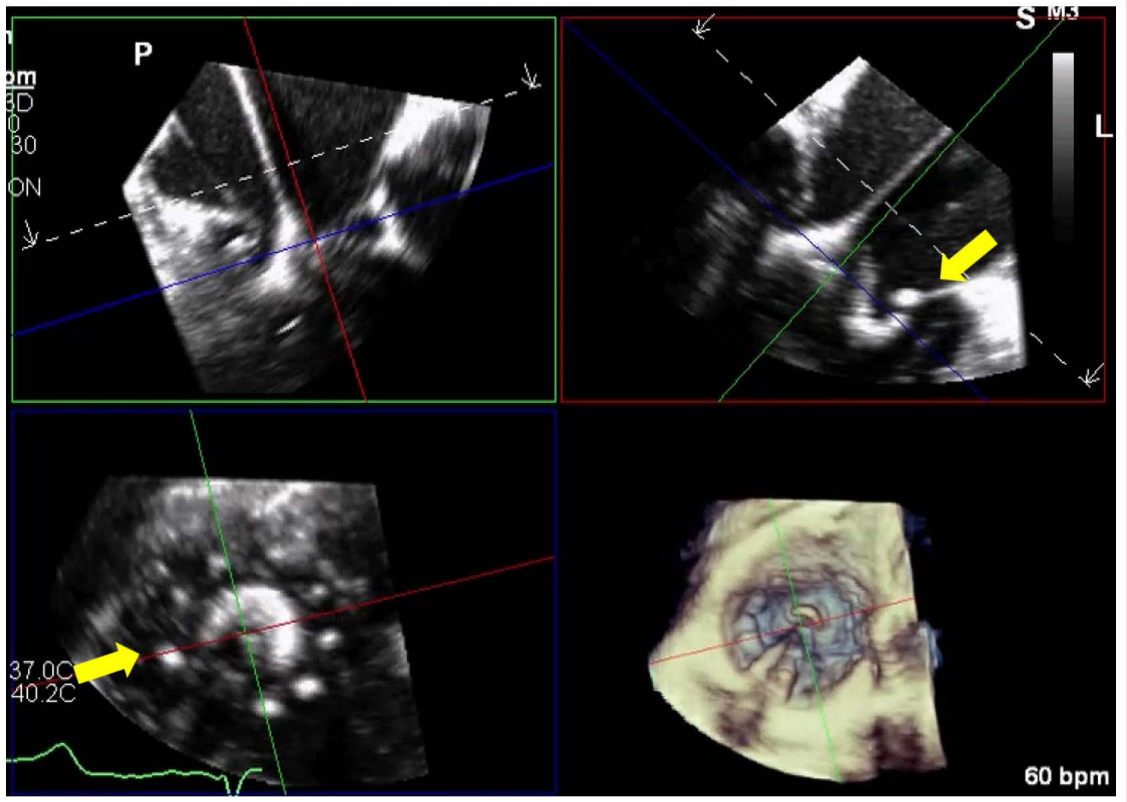


FIGURE 5

Live 3D MPR during transcatheter tricuspid valve replacement with the Evoque™ valve. After the nine anchors are exposed below the tricuspid valve leaflets, each one should be interrogated to ensure adequate leaflet capture. In this case, the red plane intersects one of the anchors (yellow arrow) and the position of the leaflets can be verified, before continuing the "spin" towards the next anchor.

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4th Annual ASE PCHD Virtual Echo Conference:

Interview with Jen and Shiraz

*Contributed by **Lily Berhe, MHA, RDCS, FASE**, Levine Children's Congenital Heart Center, Charlotte, NC; **Shiraz Maskatia, MD, FASE**, Stanford University Medical Center, Palo Alto, CA; **Jennifer Acevedo, ACS, RDCS, FASE**, Ann & Robert H. Lurie Children's Hospital of Chicago, Chicago, IL*

From hands-on scanning tips to lively "torturing the experts" sessions and the introduction of a fun Jeopardy hour, attendees can expect a dynamic and engaging format.

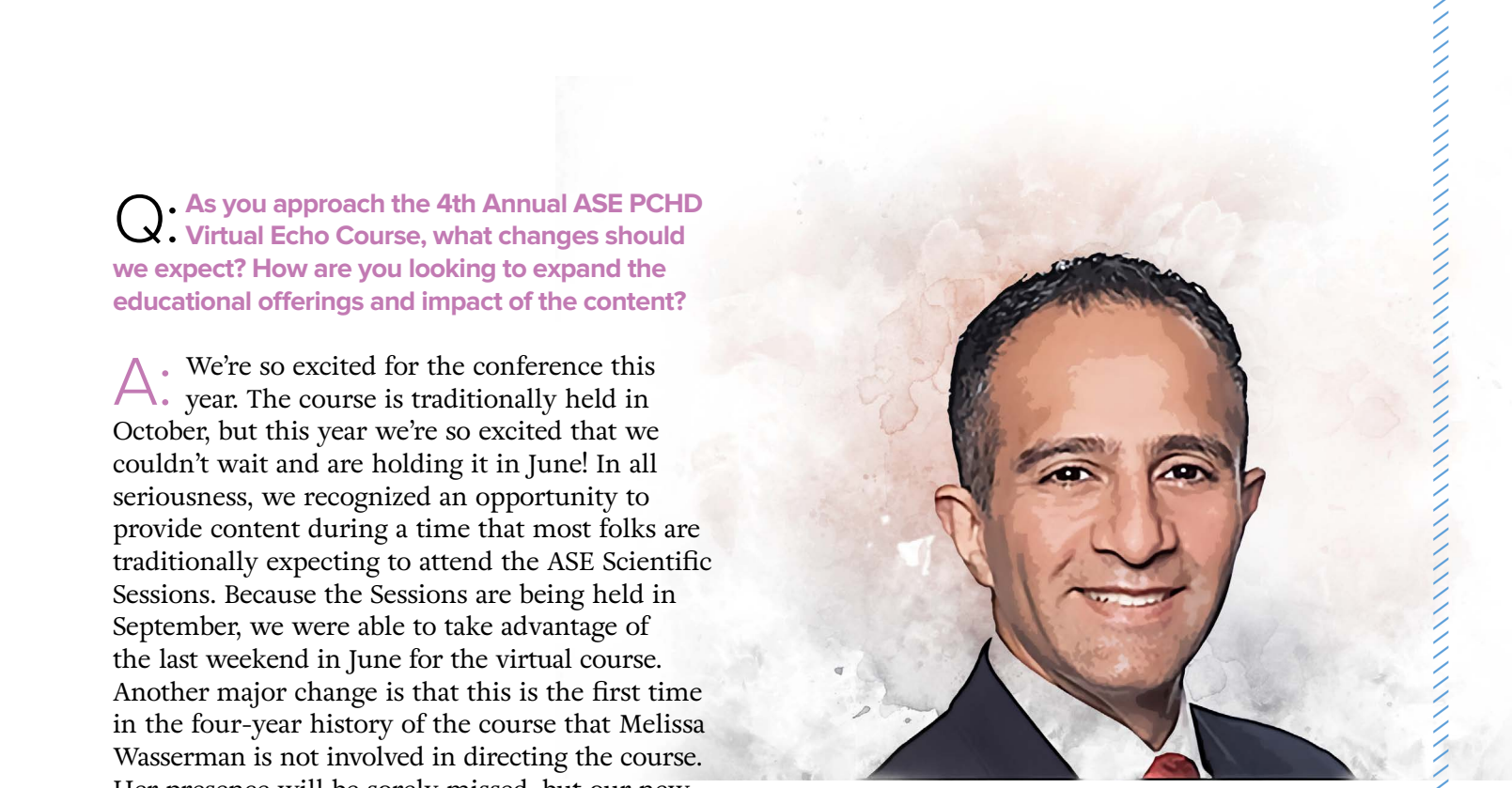
AS THE 4TH ANNUAL ASE PCHD Virtual Echo Conference approaches, some exciting new developments promise to make this year's event even more engaging and impactful. In an interview with course co-directors **Jennifer Acevedo, ACS, RDCS, FASE**, and **Shiraz A. Maskatia, MD, FASE**, we learn about the fresh changes and enhancements designed to elevate the educational experience for participants. This year's course, set for June instead of the usual October timeframe, will feature expanded live content, more interactive opportunities, and a continued emphasis on global perspectives in pediatric cardiology. From hands-on scanning tips to lively "torturing the experts" sessions and the introduction of a fun Jeopardy hour, attendees can expect a dynamic and engaging format. Read on to discover how the co-directors are working together to bring innovative ideas to this year's course and how they're using feedback from past years to make this event truly unforgettable.

Q: As you approach the 4th Annual ASE PCHD Virtual Echo Course, what changes should we expect? How are you looking to expand the educational offerings and impact of the content?

A: We're so excited for the conference this year. The course is traditionally held in October, but this year we're so excited that we couldn't wait and are holding it in June! In all seriousness, we recognized an opportunity to provide content during a time that most folks are traditionally expecting to attend the ASE Scientific Sessions. Because the Sessions are being held in September, we were able to take advantage of the last weekend in June for the virtual course. Another major change is that this is the first time in the four-year history of the course that Melissa Wasserman is not involved in directing the course. Her presence will be sorely missed, but our new co-director, Jen Acevedo, is certainly up to the task!

We've received a lot of feedback over the years about the course. Attendees have been very invested in the course every year, and we've been able to take advantage of great suggestions that have been submitted. For example, many attendees suggested including more hands-on scanning tips. So, for each session, we are including a session on imaging tips. Another suggestion was for specific sessions on coronary artery anomalies, vascular rings, and double outlet right ventricle, which are sessions that we're including this year.

Jennifer Acevedo, ASE, RDCS, FASE



Shiraz A. Maskatia, MD, FASE

Q: What did you learn from last year that you hope to apply to this year's course?

A: We had a great time last year! One thing that really struck us last year was the palpable enthusiasm from the attendees. During the live sessions and Q/A periods, attendees were actively participating by asking questions and making comments in the Q/A tool. During the fetal "torturing the experts" session, attendees would offer up their thoughts on the cases. This got us thinking that there was an opportunity to increase the interaction between faculty and attendees. So, this year we are increasing the live content during the course. We are also increasing how attendees can contribute to the conversation. This year, we will have attendees be able to choose which fetal case to torture the experts with! We will also build in polls during the course. With each session, we will have one or two questions put to the audience at

the beginning and end of the sessions. Some of these questions will be about the learning objectives, but others will be fun ways to engage.

One other lesion we learned was that switching between a webinar format and a meeting format was confusing. Many attendees were not able to join the breakout social that we held. So, this year, instead of the social, we are holding a Jeopardy hour! This will be another fun way to watch faculty squirm. We will also have polls during the Jeopardy session so that attendees will be able to participate.

Q: Last year, there was a focus on international echocardiography. Is there a specific focus for this year's course?

A. This year, we're continuing the international focus. Jen has several contacts in cardiology and echocardiography around the world. We wanted to take advantage of her contacts in Tanzania and Rwanda. We truly believe that reaching out to the international community has numerous benefits. We clearly want to promote faculty members from around the world. That said, the insight that these faculty can provide stimulates conversation and thought about novel ways to treat patients and innovate our care models.

Q: How will the course sessions be structured this year? Are there particular sessions that you'd like to highlight?

A. As in prior years, there will be a two-day course, combining live and recorded content. Each session will have a live Q/A portion. We are shortening each recorded talk slightly and increasing the length of the Q/A sessions to enhance the opportunity for audience participation. In addition to the international session, the live Jeopardy and torture the experts sessions, the sessions on coronary artery anomalies, vascular rings, and double outlet right ventricle noted above, we will have a session on neonatal echo. This session will be a nice combination of basic and high-level echo content. We will also have a session on offering advice for attendees early in their careers.

We truly believe that reaching out to the international community has numerous benefits. We clearly want to promote faculty members from around the world.

Q: Is this the first time you have both worked together? Tell us something that surprised you about the other person?

A. We've worked together a decent amount! We were both in the third cohort of the ASE leadership academy! The leadership academy is a fantastic experience, geared towards providing participants with the opportunity to enhance their knowledge and develop leadership skills. Among the 13 members of cohort 3, we are two of the three pediatric-focused members (along with Courtney Cassidy). We have also been working diligently on the match for the Pediatric Advanced Cardiac Imaging (PACI) fellowship. This effort to create a match system was born out of brainstorming during Shiraz's time on the ASE pediatric steering committee. At that time, Jen was the sonographer chair for SOPE, the Society of Pediatric Echocardiography. By working together, along with the rest of the PACI match working group, we were able to arrange for SOPE sponsorship and endorsement from ASE.

Shiraz: It seems like I've known Jen forever, and it's hard to think back about what surprised me about her! That said, I would probably say that I'm constantly surprised by her breadth. She is involved in so many different groups in so many ways. For example, beyond her work with ASE, she is a champion for the use of echo-enhancing

agents. She also works with high school kids to introduce them to careers in healthcare. Oh, and by the way, she travels to Tanzania to help with training and program building and is a devoted mother. She is incredibly organized and goal oriented. I guess you must be when you're involved in so much!

Jen: I remember the first time I met Shiraz! We were both volunteering at an ARDMS event, May 2015. He was part of the fetal echocardiography team, and I was part of the pediatric echocardiography group. Our group would spend time together after the meeting; you really get to make lasting connections at these types of events. We would run into each other annually at the Scientific Sessions (I like to call it Echo Camp) and catch up. Fast-forward to 2022, we were both selected into the ASE Leadership Academy, and this is when I realized we have a lot in common, wanting to help others and championing for education, inclusivity, and equity. During this time, I was also serving as the sonographer chair for the Society of Pediatric Echocardiography. Shiraz was working with a team to create the PACI match within SOPE. It was outside of my bubble, but I am always happy to learn new things, so Shiraz and I worked closely during the inaugural match and continue to work closely on the PACI match. Now we are here! Two former Leadership Academy graduates are putting together the ASE PCHD Virtual Course!

Fun fact about Shiraz- He has moves! My first ASE Gala was a blast! He and our fellow Leadership Academy classmates Purvi and Kiran took over the dance floor in Seattle. It was a great time. All-in-all, Shiraz isn't a colleague; he is a friend. This is what makes pediatrics so special.

Q: Will the meeting content again be recorded and offered to registrants to view retrospectively if they are unable to attend the (virtual) meeting live?

A: Yes, many attendees noted that a major benefit of course participation was being able to view the content on their own time. While we encourage live participation so that attendees can take advantage of the Q/A and other opportunities for interaction, it can be tough to devote 7 hours, two days in a row, to education. The platform allows attendees to view sessions that they may have missed later or review content that they had already seen live. ASE is only charging $199 for ASE members and $250 for non-members. Furthermore, in celebration of ASE's 50th anniversary, all new members receive $50 off registration. Even more impressive, membership is FREE for all students and trainees!

Here is a photo from the first time we met, oldie but goody!

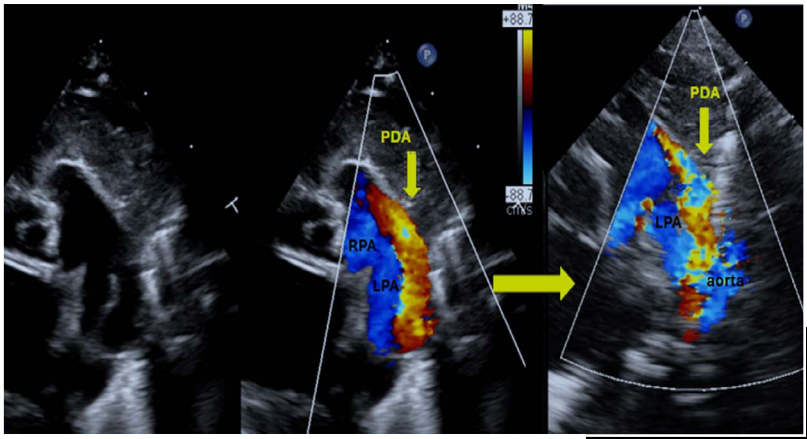
TIPS & TRICKS

"Make every detail perfect and limit the number of details to perfect."
– Jack Dorsey

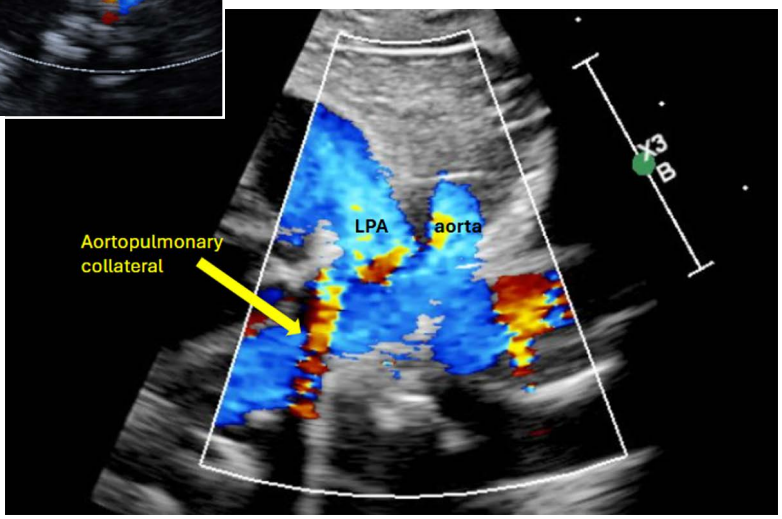
As congenital cardiac imagers we appreciate the value of sharing tips and tricks amongst colleagues at our institutions. Considering this, the Pediatric & Congenital Heart Disease Council believes that our section of the Echo magazine may be a great avenue to share our tricks of the congenital cardiac imaging trade with colleagues across the globe. In this article we will focus on clues to coronary artery imaging.

*Contributed by **Rebecca C. Klug, BA, ACS, RDCS, (AE, PE), RT(R), FASE**, Mayo Clinic Rochester, MN and **Elena N. Kwon, MD, FASE,** Children's Hospital at Montefiore, Bronx, NY*

DIFFERENTIATING A PATENT DUCTUS ARTERIOSUS (PDA) FROM AN AORTOPULMONARY (AP) COLLATERAL



- If a third vessel is seen between the LPA and the proximal descending aorta it is a PDA.



- If a third vessel is seen after the level of the left pulmonary artery it is an aortopulmonary collateral.

TECHNICAL TIPS FOR THE "DUCTAL VIEW"

- 2D imaging: Use harmonics to give more definition to the walls of vessels.
- Find the high left parasternal sagittal (ductal) view by sliding high up from the parasternal short axis view of the branch pulmonary arteries and go counterclockwise to 12-1 o'clock.
- Open the left pulmonary artery (LPA) lengthwise and keep the right pulmonary artery (RPA) short.
- Sweep from the LPA towards the proximal descending aorta by 2D and Color.
- In the absence of a PDA or AP collateral the LPA and aorta should be the only two vessels seen lengthwise.

TEN KEY POINTS

FROM THE NEW ASE GUIDELINE FOR ECHOCARDIOGRAPHIC ASSESSMENT OF THE RIGHT HEART IN ADULTS AND SPECIAL CONSIDERATIONS IN PULMONARY HYPERTENSION

The American Society of Echocardiography (ASE) has recently released updated guidelines titled "Guidelines for the Echocardiographic Assessment of the Right Heart in Adults and Special Considerations in Pulmonary Hypertension." This document replaces the 2010 ASE right heart guidelines and introduces several impactful changes. Below, we summarize the 10 most important components of the updated guidelines:

1. **Optimal Echocardiographic Assessment Techniques:** The echocardiographic evaluation of the right heart should be performed using optimal acoustic windows and specific echocardiographic views. Right-sided measurements must be reported in a standardized manner to ensure consistency in clinical practice.

2. **Multiparametric Approach:** Right ventricular function needs to be assessed through a multiparametric approach, avoiding reliance on a single parameter to provide a comprehensive view.

3. **Reference Values for Normality and Abnormality:** The updated guidelines provide revised reference values to define normality and grade abnormalities for various right heart echo parameters. Based on a critical review of existing literature, these values enable clinicians to differentiate normal cases from abnormal ones and identify the severity of conditions (mild, moderate, or severe) whenever possible.

4. **Focus on Pulmonary Vascular Disease:** A special emphasis is placed on the evaluation of the right heart in patients with pulmonary vascular disease. This includes aspects of screening, detection, monitoring therapeutic responses, and prognostication to enhance patient outcomes.

Contributed by ***Benjamin H. Freed, MD, FASE****, Northwestern Memorial Hospital, Chicago, IL and* ***Luna Gargani, MD, PhD****, University of Pisa, Pisa, Italy*

5. **Understanding Right Heart Changes in Pulmonary Hypertension:** The assessment of the right heart is contextualized according to the updated pulmonary hypertension classification provided by the WHO 7th World Symposium on Pulmonary Hypertension. This aids in understanding how the right heart adapts to pulmonary vascular disease, particularly focusing on structural and functional changes that occur in response to increased afterload.

6. **Assessment of the Tricuspid Valve:** There is a greater focus on evaluating the tricuspid valve, particularly in the context of atriofunctional and ventricular-functional tricuspid regurgitation.

7. **Assessment of the Pulmonic Valve:** The guidelines include a detailed anatomical description of the pulmonic valve, highlighting its significance in both pulmonary hypertension and congenital heart disease.

8. **Importance of Right Atrial Function:** The relevance of right atrial function in various conditions affecting the right heart and pulmonary circulation is recognized. The technique of evaluating right atrial strain using speckle-tracking echocardiography (STE) is emerging as a promising approach.

9. **3D Assessment of Right Heart Structures:** New data has been incorporated regarding the 3D assessment of right heart structures, including the right atrium. This advancement allows for a more comprehensive evaluation of right heart anatomy and function.

10. **Dynamic Testing Strategies:** The guidelines encourage using fluid challenges and exercise stress tests to detect early alterations not visible at rest, offering deeper insights into right heart function.

The 2010 ASE guidelines made a substantial impact by standardizing the echocardiographic assessment of the right heart in adults. The new guidelines maintain many of the echo parameters, including their acquisition and cut-off values, but place increased emphasis on their clinical relevance in the context of pulmonary hypertension. This enhances our understanding of the myocardial remodeling that occurs as a consequence of this disease ***(Figure 4 from the guideline)*** improving the clinician's ability to care for patients at risk and with an already established diagnosis of pulmonary hypertension.

The new guidelines also offer more detailed recommendations for assessing tricuspid and pulmonic valve disease, which are frequently associated with PH. This will help clinicians better understand the functional implications of these valvular abnormalities in the context of right ventricular dysfunction and pulmonary hypertension. Given the increasing interest in tricuspid valve function and the availability of new treatment options, it's essential to comprehensively describe and characterize this valve apparatus. Moreover, the incorporation of recent data on 3D echocardiography and myocardial strain offers a greater opportunity for more regular clinical use.

A significant change in the new guidelines is reflected in Table 1 of the new guideline document, which now presents ranges for disease severity associated with each echocardiographic parameter, facilitating standardized assessments that will support therapeutic decisions, ongoing monitoring, and clinical research endeavors. This will also aid in the early detection of right heart involvement, identifying those patients who already have structural alterations.

The emphasis on the systematic and comprehensive step-by-step approach to right heart evaluation, detailing optimal

acoustic windows, imaging views, and parameters is critical to promote standardization in image acquisition and reporting. Reducing variability and improving the reliability of echocardiographic findings, especially for the so-called "forgotten chambers", is necessary to improve what is often the most poorly described cardiac structures in echocardiographic reports. By establishing the essential role of echocardiography in screening, detection, monitoring, and prognostication of pulmonary hypertension, these updated guidelines will strongly support clinicians in making more informed management decisions, ultimately improving patient outcomes.

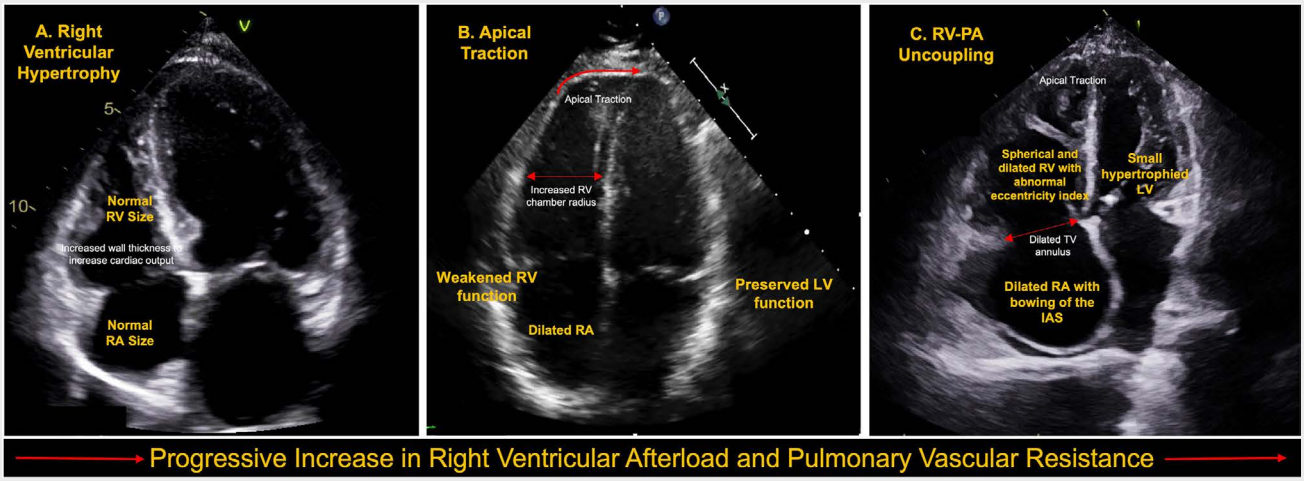


Figure 4

Right heart remodeling in PH. (A) The right ventricle initially responds to increased afterload by increasing RVWT to increase contractility and maintain CO. (B) With progressive PH, the contractile increases are insufficient to maintain CO, and the chamber dilates to increase SV. There may also be signs of apical traction, where the RV apex is tethered leftward because of weakened RV function and the inability to counteract LV forces. (C) Ultimately, there is an increase in right heart chamber sizes and RV systolic dysfunction, and abnormal LVEI, leading to diminished left ventricular performance, ventricular interdependence, and RV-PA uncoupling. TVA dilatation and FTR may also be present. IAS, Interatrial septum. (This figure is from Guidelines for the Echocardiographic Assessment of the Right Heart in Adults and Special Considerations in Pulmonary Hypertension: Recommendations from the American Society of Echocardiography, published in the March 2025 Journal of the America Society of Echocardiography. Reprinted with permission from Elsevier Inc. on behalf of ASE.)

Designing a Tailored Career Path: A Guide to Creating Flexible Career Ladders

A special thank you to the American Society of Echocardiography (ASE) Sonographer Career Ladder Workgroup for their tireless efforts in working on this project.

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Given the continuous evolution in ultrasound technology, clinical diagnostic techniques, and therapeutic interventions, professional growth is essential in cardiovascular ultrasound. We realize the need for a Career Ladder for advancement within the field. Navigating the intricate pathways of a cardiac sonographer career requires a strategic blend of education, experience, and a diverse skill set. This career ladder provides a clear roadmap for aspiring sonographers, outlining the path from entry-level to an experienced professional. Anchored in a foundation of academic achievement, this career ladder ascends through milestones of hands-on experience, specialized credentials, leadership roles, and contributions to the field. From mastering the details of cardiovascular imaging to embracing leadership opportunities and advancing in specialized areas, this guide illuminates the journey towards excellence in cardiac sonography.

Statement from: ASE Sonographer Career Ladder Workgroup

The ASE Sonographer Career Ladder document is a set of recommendations developed by the ASE Cardiovascular Sonography Council. While this document provides guidance and suggested pathways for career advancement within echocardiography, it is important to note that these recommendations are not prescriptive mandates. This document is designed to be inclusive of various careers within cardiac sonography, encompassing specialties such as fetal, pediatric, structural heart, and other subfields.

We encourage each laboratory to review the document and adapt its recommendations to best fit the unique needs, circumstances, and goals of their specific environment. The career ladder should be considered a flexible framework to support the professional growth of sonographers, rather than a rigid set of rules. Ultimately, implementing these guidelines should enhance your team's effectiveness and development in a way that aligns with your lab's practices and objectives.

This document is a living document that will be reviewed on an ongoing basis, annually to adapt to the changing landscape of echocardiography.

Benefits of a Career Ladder

Engagement: Creating opportunities for career advancement motivates employees, fostering engagement, ambition, and commitment. Engaged and ambitious staff contribute to quality improvement, ultimately leading to better patient care outcomes. Career ladders empower employees to take ownership of their success. Recognition and appreciation of sonographers' contributions can enhance their motivation and commitment to organizational objectives. This reduces turnover and encourages them to grow within the organization rather than seeking higher pay elsewhere. Celebrating employee successes through career ladders strengthens commitment, which is more financially beneficial than hiring new staff. Experienced sonographers are also more cost-effective than new graduates. Investing in both new and experienced sonographers through career ladders allows both groups to thrive.

Mentoring: Career ladders enable senior employees to mentor new hires, fostering camaraderie and development of in-house talent. This commitment to mentoring creates a supportive community within the department and facility. This will increase employee morale and brand power. Mentoring also creates a culture of communication and collaboration, which is imperative for sonographer development. Talent development through mentoring creates

succession planning opportunities and prepares high-potential employees for leadership positions. Mentor/mentee relationships promote retention and commitment by bolstering job satisfaction.

Retention: Career ladders promote retention by providing clear goals for employees to strive toward. Lower turnover rates contribute to a positive work environment, increased productivity, reduced onboarding, recruitment, and training costs. Employee retention preserves employees with institutional knowledge and skills. Consistent staffing enhances patient confidence.

Financial Implications: Implementing a career ladder incurs initial costs, yet the ultimate benefits outweigh these expenses. This is achieved through delivering high-quality service to the community, thereby enhancing brand reputation. Failure to develop a career ladder may result in the sonographer staff feeling stagnant, less engaged, and lead them to seek opportunities elsewhere. Replacing an experienced sonographer is estimated to cost organizations an additional 6-9 months of salary.[1] Institutions with a career ladder may be more successful in recruiting highly skilled cardiac sonographers to their labs. All these factors result

	POINTS
Degree (select your highest degree)	
Graduate from non-accredited (CAAHEP) sonography program	1
Graduate from accredited (CAAHEP) sonography program 2	2
Bachelor's Degree	3
Master's Degree	4
Doctoral Degree	5
Total years of experience in echocardiography (select highest range)	
Less than 1 year	0
Greater than or equal to 1 and less than 3 years	1
Greater than or equal to 3 and less than 7 years	2
Greater than or equal to 7 and less than 12 years	3
Greater than or equal to 12 years	4
Credentials (add points for each practicing registry)	
Registry eligible	0
RDCS-AE, RCS or equivalent international designation	1
RDCS-PE, RCCS or equivalent international designation	1
RDCS-FE, RCCS or equivalent international designation	1
Advanced Credentials such as ACS	1
Other registry actively practicing pertinent to position	1
FASE	1
Current competencies (add points for all active procedures)	
Advanced Stress Echo in Non-Ischemic Heart Disease	1
Advanced TTE Imaging Modalities	1
Advanced TEE Imaging Modalities	1
Hybrid Intraoperative Imaging	1
Complex Congenital Heart Disease	1
IV Training/Insertion or Injection	1

Leadership	
Implement a guideline driven protocol	1
Mentor junior sonographer to achieve competency in one area listed above	1
Mentor cardiology fellow to achieve scanning competency	1
Clinical Preceptorship- Students (8–12 hours/week) and/or Fellows	1
Serve on the Board of Directors or Executive Committee of a national or international organization or society.	2
Presentation/Publication (within 3 years)	
Presentation (in person or virtual) at local meeting	1
Presentation (in person or virtual) at national/international conference	2
Author or Co-Author on a peer-reviewed research publication	3
Volunteering (within 3 years)	
Volunteer at a community health cardiovascular related outreach program	1
Volunteer within a cardiovascular professional or credentialing organization	1
Specialization	
Performs research studies/CITI or sponsor	1
Research coordination/leadership	1
Maintains Quality Improvement Initiatives/Technical Director	1
PACs super user/Machine super users	1
Health and Safety management	1

Career LEVEL	Total points (from above)
Cardiovascular Sonographer I	1 to 6
Cardiovascular Sonographer II	7 to 10
Cardiovascular Sonographer III	11 to 14
Cardiovascular Sonographer IV (strongly encourage ACS)	15 +

in long-term savings and staffing level stability, making the lab more efficient.

Degree (select your highest degree and only award points for one degree even if you have two of the same degrees). Example: having two bachelor's degrees receive 3 points not 6 points.
The suggested degree is a graduate of a programmatically accredited (CAAHEP, USDOE, CSA, or CMA) program in cardiac or vascular ultrasound as a(n) certificate, associate degree, or bachelor's degree.

- **Graduate of non-accredited echocardiography program**
  A graduate of a non-accredited program is also acceptable, but the program must be health related.

The degree(s) from ultrasound programs or colleges from the United States or Canada which may include a health-related field such as: cardiovascular technology, ultrasound, radiologic technology, respiratory therapy, allied health science or nursing which are recommended are the following:
- Graduate from non-programmatically accredited (CAAHEP) sonography program
- Graduate from a programmatically accredited (CAAHEP) sonography program
- Bachelor's Degree
- Master's Degree
- Doctoral Degree

An international bachelor's degree, master's degree, and doctoral degree (MD, DO, or MBBS degree) also qualify if the international certification equivalency is comparable or greater than training in the United States (as represented with a formal foreign transcript).

TOTAL YEARS OF EXPERIENCE IN ECHOCARDIOGRAPHY (SELECT HIGHEST RANGE)

One of the elements of professional growth is hands-on clinical experience. Through hands-on clinical experience, a sonographer gains theoretical knowledge and advanced scanning abilities. As sonographers become more independent in their scanning and interpretive abilities they are exposed to increasingly complicated pathologies. At later stages of their careers, sonographers are placed in positions of increased responsibility (technical and administrative leadership positions). For this document, total years of experience may be calculated using either full-time (32-40 hours/week) or part-time (at least 20 hours/week) experience. These suggested years of experience are not meant to include clinical hours performed during the sonographers training program.

CREDENTIALS (ADD POINTS FOR EACH PRACTICING REGISTRY)

The field of sonography contains many specialized areas, all of which carry a different knowledge base. Credentials are earned by passing registries. Registries define the specialization area the sonographer is competent in. Credentials ensure that the sonographer has the validated skills and training necessary to practice in an area they are assigned.
- **Registry Eligible:** the sonographer meets or will meet the qualifications to sit for the ARDMS (American Registry for Diagnostic Medical Sonography), CCI (Cardiovascular Credentialing International), or international equivalent (such as but not limited to British Society of Echocardiography) exam pertinent to their role but has not passed the exam to date. There should be an agreed upon window to obtain the registry, usually within one year.
- **RDCS-AE** (Registered Diagnostic Cardiac Sonographer-Adult Echo) obtained from ARDMS, **RCS** (Registered Cardiac Sonographer) obtained from CCI, **or equivalent international designation** (such as but not limited to: ASAR (Australian Sonographer Accreditation Registrar) accreditation board within Australia, CRCS (Canadian Registered Cardiac Sonographer) credential with Sonography Canada, MRTB (Medical Radiation Technologist Board) registration board in New Zealand, and BSE (British Society of Echocardiography) credential within the United Kingdom) – Credentialling for the sonographer working in the area of adult echocardiography. This registry tests the sonographer's knowledge of normal and abnormal cardiac anatomy, physiology, pathology, and hemodynamics in the adult patient.
- **RDCS-PE** (Pediatric Echo) obtained from ARDMS, **RCCS** (Registered Congenital Cardiac Sonographer) obtained from CCI, **or equivalent international designation** (such as but not limited to congenital heart disease (CHD) accreditation from BSE) – Credentialling for the sonographer working in

pediatric and adult congenital cardiac ultrasound. This registry tests the sonographer's knowledge of normal and abnormal cardiac anatomy, physiology, pathology, and hemodynamics as applicable to those individuals living with CHD or surgically corrected CHD.

- **RDCS-FE** (Fetal Echo) obtained from ARDMS – Credential assesses the sonographer's knowledge of normal and abnormal fetal cardiac anatomy, physiology, pathology, and hemodynamics in singleton and multiple gestation pregnancies. In addition to the heart the FE exam tests the sonographer's understanding of extracardiac structures and assessments like growth, vessel circulation and fluid volumes.
- **Advanced Credentials such as ACS** (Advanced Cardiac Sonographer) obtained from CCI – Credentialing for those sonographers that practice at an advanced level in the echocardiography laboratory. The ACS is committed to quality
- improvement, mentoring students and fellows, performing advanced echocardiograms, reviewing preliminary echo reports, implementing education plans, and coordinating cardiac ultrasound research. Top level sonographer should hold the ACS credential.
- **Other registry actively participating pertinent to position** – For example, obtaining a RVT (Registered Vascular Technologist) from ARDMS or RVS (Registered Vascular Sonographer) from CCI in addition to previously earned credential where the sonographer works in a lab that is completing vascular ultrasound exams as well as cardiac ultrasounds.
- **FASE** (Fellow of the American Society of Echocardiography) – This designation recognizes the dedicated ASE member with an extraordinary commitment to the field of cardiovascular ultrasound. This designation is achieved through a peer review process.

CURRENT PROFICIENCIES/COMPETENCIES (ADD POINTS FOR ALL ACTIVE PROCEDURES)

Throughout their career, sonographers continually acquire new competencies which add value to their team. This increased skill level results in a more comprehensive assessment of anatomy and hemodynamics used to guide treatment. With each new skill acquired, a sonographer not only broadens their clinical capabilities but also deepens their impact in the medical field, ultimately contributing to better patient outcomes. Sonographers apply the following skills within their scope of practice,[2] adhering to jurisdictional regulations, in collaboration with physicians, and following ASE guidelines:

With each new skill acquired, a sonographer not only broadens their clinical capabilities but also deepens their impact in the medical field, ultimately contributing to better patient outcomes.

- **Advanced Stress Echo in Non-Ischemic Heart Disease:** sonographers are competent in performing stress echocardiograms to assess valvular pathology, severity of HCM, diastolic function, pulmonary hypertension, congenital heart disease, and other exams whose purpose is not to evaluate ischemia.
- **Advanced TTE Imaging Modalities:** Sonographers are competent at optimizing and manipulating 3D data sets and strain images with accuracy and reproducibility. Examples include assessing the functionality of cardiac chambers, valves, and vessels.
- **Advanced TEE Imaging Modalities:** Sonographers are competent in optimizing 3D and strain imaging with accuracy and reproducibility. 3D TEE sonographers are competent in assisting with acquisition, optimizing and postprocessing 3D data sets, and manipulating them to assess the severity and location of pathology. These sonographers regularly participate in 3D TEE imaging with a supervising physician. It is the position of ASE that Sonographers do not introduce the TEE probe.[3]
- **Hybrid intraoperative:** Sonographers are competent in obtaining TTE images, assisting with acquisition of TEE images, optimizing and postprocessing 3D data sets and manipulating the images to guide interventional procedures. These sonographers regularly participate in interven-

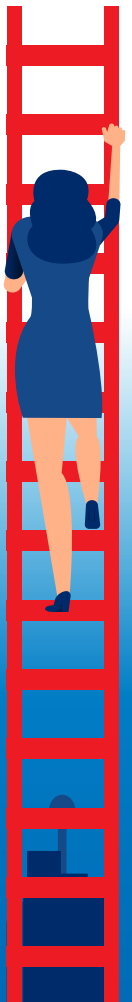
tional procedures. Intracardiac Echocardiography (ICE) – These sonographers are competent at optimizing images for acquisition, manipulating 3D data sets, and regularly participate in ICE guided procedures with a supervising physician.

- **Complex Congenital Heart Disease:** Sonographers demonstrate advanced proficiencies in assessing complex congenital heart disease seen in fetal/pediatric/ACHD echocardiography. These sonographers exhibit a comprehensive understanding of cardiac anatomy and physiology and employ critical thinking skills to correlate clinical presentations with echocardiographic findings.
- **IV Training/Insertion or Injection:** Sonographers deemed competent by their facility to obtain IV access or inject ultrasound enhancing agents (UEA) and/or agitated saline studies. This knowledge is then used to train fellow sonographers.[2]

LEADERSHIP

Leadership in sonography is key to the growth and maintenance of a cohesive and respectable work environment. Leadership can be defined as a specific person (or persons) who works to guide and impact specific and measurable outcomes and enables groups of people to work together to accomplish what they might not while working individually.

- **Implement a guideline-driven protocol:** Researching, compiling, and implementing a new or updated protocol demonstrates great leadership skills. It takes a great amount of dedicated time, research, and application of specific ASE guidelines. Protocol implementation should be directly related to the examinations performed daily per laboratory/clinic/hospital setting.
- **Mentor early career sonographers to achieve competency (in one area listed above):** A leader will also dedicate
- their time to educate and train their fellow junior sonographers in one or more of the following competencies: stress echocardiography, 3D imaging in TEE, strain imaging, hybrid intraoperative imaging, complex congenital heart disease, and IV training/insertion or injection. A junior sonographer is defined as a sonographer with < 3 years of experience or new hire/cross trainee who has not performed the above competencies in their previous position.
- **Mentor cardiology fellows to achieve scanning competency:** The competencies required of cardiology fellows will be
- determined by the facility and faculty. Imaging competencies can include TTE or Point of Care Ultrasound (POCUS) image
- acquisition.
- **Clinical Preceptorship - Students and/or Fellows (8-12 hours per week):** Clinical preceptorship



Leadership in sonography is key to the growth and maintenance of a cohesive and respectable work environment.

should be in a one-on-one setting and should include at a minimum: teaching scanning skills, appropriate patient/staff communication, and examination reporting/billing.

- **Serve on the Board of Directors or Executive Committee of a national or international organization or society:**
- Such as, but not limited to American Society of Echocardiography (ASE), Society of Diagnostic Medical Sonography
- (SDMS), European Society of Echocardiography (ESC), British Society of Echocardiography (BSE), or credentialing organizations (such as Intersocietal Accreditation Commission (IAC), American Registry for Diagnostic Medical Sonography (ARDMS) or Cardiovascular Credentialing International (CCI).

PRESENTATION

The formation and opportunity of presenting medical education is encouraged by sharing knowledge and understanding regarding a specific cardiovascular topic. Giving presentations (live, virtual, or recorded), allows the sonographer to show that they are passionate about actively engaging ideas and solutions in evidence-based medicine. The ability to present also reflects confidence in the sonographer's communication skills. It is recommended that the presentation occurred within the last 3 years.

- **Presentation at local meeting:** ASE recognizes informational outreach on a local level for local society/medical meetings (such as local echo society chapters).
- **Presentation at national/international conference:** Presentations (invited or abstract based) may be achieved for the American Society of Echocardiography (ASE) either at the annual Scientific Sessions, or as a Webinar. Presentations may be given for a larger scale healthcare audience at a national or international event (which include but are not limited to the following organizations: American College of Cardiology, Pediatric World Congress of Cardiology and Cardiovascular Surgery, European Society of Echocardiography, and the American Heart Association).
- **Author or Co-Author on a peer-reviewed publication:** Presentation on a peer-reviewed article is an excellent way to promote the latest research, technologies, and techniques in echocardiography, as well as update fellow healthcare professionals with advances and learning practices in cardiovascular medicine.

Giving presentations (live, virtual, or recorded), allows the sonographer to show that they are passionate about actively engaging ideas and solutions in evidence-based medicine.

VOLUNTEERING

Volunteer engagement showcases a sonographer's dedication and passion for advancing echocardiography practice. Volunteering provides sonographers the opportunity to acquire new skills, knowledge, and networking opportunities that are crucial for professional growth. Volunteering acts as a catalyst for career progression, positioning cardiac sonographers for advancement by enriching their professional portfolio with valuable experiences and achievements. It is recommended that the volunteer service occurred within the last three years.

- **Volunteer at a community health cardiovascular related outreach program:** Volunteering in community health programs or cardiovascular outreach initiatives such as, but not limited to: Remote Area Medical (RAM), Project C.U.R.E. (Commission on Urgent Relief and Equipment), or any local free clinics or health fairs - all provide sonographers the opportunity to enhance the quality of cardiovascular health services the patients receive by applying their expertise and diagnostic skills in real-world settings.
- **Volunteer within a cardiovascular professional or credentialing organization:** Active participation in professional societies (such as, but not limited to ASE, SDMS, and/or local echocardiography societies) or credentialing organizations (such as ARDMS or CCI) offers cardiac sonographers:
  - **Continuing education:** Societies provide access to the latest research, technologies, and techniques

Volunteering provides sonographers the opportunity to acquire new skills, knowledge, and networking opportunities that are crucial for professional growth.

in echocardiography through workshops, conferences, and online resources.

- **Networking opportunities:** Involvement in professional societies or credentialing organizations allows sonographers to
- connect with peers, mentors, and leaders in the field. Networking can lead to collaboration opportunities and professional support that can be invaluable throughout your career.
- **Influence on standards and practices:** Participation in professional societies offers sonographers a platform to contribute to the development of standards, guidelines, and policies. This involvement ensures the profession remains dynamic and responsive to the evolving healthcare landscape.
- **Personal and professional growth:** Engaging professional societies or credentialing organizations fosters a sense of community among sonographers. It offers opportunities for leadership, teaching, and personal development outside the clinical setting, enriching the professional journey.

SPECIALIZATION

By specializing in one of the following areas, sonographers prove competence in specific specialty areas that are valuable to maintain lab accreditation and qualification to provide quality medical care.

- Qualified to perform research studies/CITI* or sponsor training: Participating in research within the echocardiography (echo) lab can vary from routine tasks like conducting standard of care echocardiograms, which will later be utilized in clinical research studies, to more involved roles such as coordinating/initiating/leading various research activities beyond merely scanning.

While performing clinical research echocardiograms may fall within a sonographer's typical job responsibilities, there are instances where additional training and qualifications are required. For example, participation in certain studies might necessitate completion of a Collaborative Institutional Training Initiative (CITI) program, which ensures that individuals involved in research understand ethical principles and regulatory requirements. Additionally, some research protocols may require sonographers to submit sample echocardiograms to confirm compliance with the studies specific guidelines and protocols before being permitted to participate fully in the study. These measures help uphold the integrity and quality of the research being conducted while ensuring that all involved parties adhere to ethical standards and regulatory protocols.

- Performs research coordination: A more senior research sonographer may be assigned with a leadership role on the team, overseeing the coordination of the sonographer research team coordinating sonographers' assignments to various research protocols and ensuring everyone on the research team is compliant with the requirements established by the study's sponsor. They often serve as the liaison between the research sonographer team and other stake holders such as the principal investigator, study coordinator, or study sponsor.
- Maintains Quality Improvement Initiatives/ Technical Director: Quality assurance ensures quality in the echo lab is a collective responsibility, but there are instances where certain sonographers can take on elevated roles, such as leading the

By specializing in one area, sonographers prove competence in specific specialty areas that are valuable to maintain lab accreditation and qualification to provide quality medical care.

lab's Quality Improvement/Quality Assurance (QI/QA) program. In this capacity the sonographer oversees various aspects of quality assurance within the lab. This role also often involves coordinating the lab's peer review program, selecting cases for multimodality correlation, and ensuring report completeness and timeliness. Additionally, the sonographer may be responsible for managing the lab's accreditation or reaccreditation requirements assuring that the lab meets the standards set by the Intersocietal Accreditation Commission (IAC). This involves maintaining documentation, implementing quality improvement initiatives, and submitting (electronically) (re)accreditation materials. In some cases, the sonographer may serve as the Technical Director of the echo lab, overseeing the daily operations of the lab and performing scanning duties. This role can involve managing staff, maintaining equipment, overseeing staff scheduling, and ensuring compliance with regulatory requirements.

- **PACs super user/Machine super users:** Super users of the Picture Archiving and Communication System (PACS) play a vital role in maximizing the efficiency and effectiveness of the system. They may be responsible for tasks such as designing templates and reports to streamline the interpretation and reporting process. Additionally, they manage image storage and organization within the PACS, ensuring that studies are properly uploaded and accessible when needed. When issues arise with the PACS system, the super users are often the first point of contact for troubleshooting, utilizing their expertise to resolve problems promptly and minimize disruptions to workflow. Similarly, there are sonographers who specialize in troubleshooting and maintaining ultrasound machines. They are essential for ensuring the smooth operation of the lab's equipment. Their duties may include performing routine maintenance tasks and addressing any technical issues that arise. They are often familiar with the machines' measurement and calculation packages and can edit and create measurements in the machine. They can also program and customize the machines' preset packages to the echo lab's standards and preferences.
- **Health and Safety management:** Sonographers may assume expanded roles within their organization by leading critical health and safety issues that affect the department. Examples include radiation safety, ergonomics, infection control, patient safety, and accreditation readiness.

The Career Ladder should be reviewed annually to track progress, tally points earned, identify goals for advancement, and ensure ongoing achievements are sustained.

CAREER LEVEL

The Career Ladder should be reviewed annually to track progress, tally points earned, identify goals for advancement, and ensure ongoing achievements are sustained. Annual reviews allow sonographers to celebrate progress made, assess goals completed or in progress, and outline new objectives to work towards moving up to the next level when points are accrued. This process fosters continued growth and development by keeping future career aspirations and improvements in plain view.

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SUGGESTED READINGS

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INTRODUCING ASE'S FUTURE LEADERS:

WELCOME, COHORT 4 OF THE LEADERSHIP ACADEMY!

Contributed by ***Madhav Swaminathan, MD, MMCi, FASE****, Program Director of the ASE Leadership Academy, Atrium Wake Forest Baptist Medical Center, Winston Salem, NC*

Founded in 2018 by past president, Neil Weissman, MD, FASE, the ASE Leadership Academy is a strategic investment in tomorrow's leaders in cardiovascular ultrasound. This transformative journey goes beyond traditional professional development, helping participants discover leadership talents they never knew they possessed. Through a comprehensive curriculum that blends leadership theory with practical application, the Leadership Academy equips participants with essential skills rarely taught in medical education—from communication and conflict management to financial acumen and strategic thinking. Through engaged mentorship and peer networking, these emerging leaders gain not only practical skills in managing complex organizations but also the confidence to lead with compassion and purpose in a rapidly changing healthcare landscape. The past three cohorts that have graduated from the program since 2018 have been extraordinarily successful as leaders at ASE, in their institutions, and in their communities. We welcome cohort 4 participants as they embark on a unique learning experience to enhance their leadership skills.

The fourth cohort of the Leadership Academy is a vibrant and energetic group that will lead the next phase of innovation and growth of cardiovascular ultrasound. During their time together, Cohort 4 participants will experience a profound shift in how they see themselves and their capacity to make a difference. By cultivating these leaders today, ASE ensures its continued growth and impact on cardiovascular care around the world. As these graduates carry their experiences back to their institutions and communities, they become ambassadors of ASE's commitment to its mission of advancing cardiovascular ultrasound and improving lives through not just technical excellence, but genuine human connection and care. As the Chair of Cohort 4, I am honored to lead this stellar group in a visionary program founded by a visionary leader.

The cohort was asked to share what they were most looking forward to from being a part of the Leadership Academy, and what a good leader looks like to them.

Vidhu Anand, MBBS, FASE,
Mayo Clinic College of Medicine and Science, Rochester, MN

I am most looking forward to growing alongside other driven colleagues and gaining practical tips and tools from experts—including Kathy Pearson, her team, and ASE leaders—that will help me lead with confidence and clarity. I am excited to challenge myself, learn from experienced mentors, and build meaningful connections that will inspire lifelong growth. Ultimately, I hope to give back to ASE by applying what I've learned to support others, help grow the ASE community, contribute to a positive culture, and lead by example within the ever-expanding ASE family.

To me, a good leader is someone who leads with integrity, listens actively, and empowers others to do their best work. A good leader is empathetic, models resilience, communicates a clear vision, and creates a supportive environment where everyone feels valued.

I am grateful for the chance to participate in the ASE Leadership Academy Cohort 4, as it provides me with vital skills and knowledge, and enables me to connect with outstanding professionals in our industry. My aim is to utilize the insights gained to foster positive change in our community and support my professional growth.

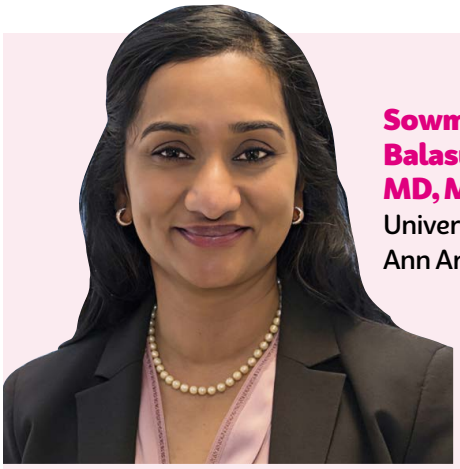
Developing into an exceptional leader involves an ongoing journey of learning and personal development. Good leadership is expressed through behavior. I am convinced that effective leaders must be authentic, revealing their true selves and exemplifying core values such as integrity and empathy. These traits are essential for fostering trust, inspiring others, and encouraging individuals within their community.

Clara Ibeth Angulo, BS, RDCS, MBA, ACS, FASE,
Houston Methodist DeBakey Heart & Vascular Center, Houston, TX

Alicia Armour, BS, MA, ACS, RDCS, FASE,
Duke Health, Triangle Heart Associates, Durham, NC

I hope to gain the advanced skills that will enable me to contribute more effectively within healthcare operations. I'm excited to gain insights and advice from those who have been successful in leadership roles as well as hone skills like problem solving, decision making, and team management. And, building a relationship with my cohort as well as the leadership team executing this program!

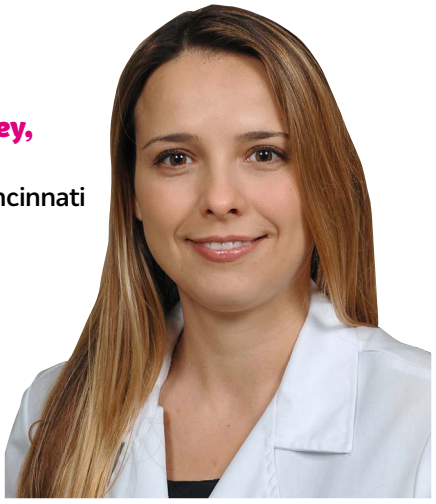
A good leader values diverse perspectives, knows how to leverage the strengths of the people around them; and holds themselves accountable. They ensure everyone is on the same page, are adaptable, and lead with integrity.



Sowmya Balasubramanian, MD, MSc, FASE,
University of Michigan, Ann Arbor, MI

Unlike, most leadership courses that last days to at most a week, the ASE Leadership Academy's longitudinal curriculum appealed to me a great deal. I knew that I would be able to more effectively incorporate and hone the knowledge and skills with this structure. Leaders in our field, that I admire a great deal have been directing this course and mentoring individuals – I could not ask for a more enriching experience. I am grateful to ASE for this opportunity and know that the relationships and lessons from this course will always stay with me.

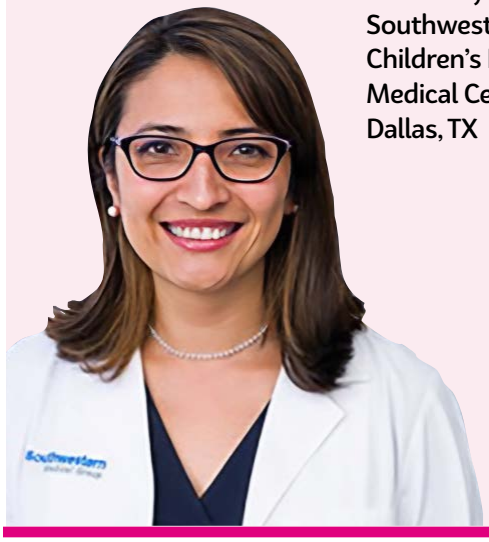
A good leader, to me, leads by example working towards a collective goal while fostering the growth of the individual, the team and the program. Styles of leadership can vary, but being authentic, empathetic and fair while leading are traits I admire the most.



Anisiia Crowley, MD, FASE,
University of Cincinnati Medical Center, Cincinnati, OH

The Leadership Academy experience has been amazing so far! I am looking forward to connecting with other physicians and sonographers from varied backgrounds, networking and learning from them. I am also hoping to improve my own communication and leadership skills.

A good leader is someone who empowers others to achieve their goals and potential. In addition, a person who creates a collegial and positive working environment.



Ingrid Moreno Duarte, MD, FASE,
University of Texas Southwestern, Children's Dallas Medical Center, Dallas, TX

I'm excited about the ASE Leadership Academy and look forward to gaining insights from experienced mentors, developing the skills needed to contribute more effectively to our field, and connecting with a network of dedicated professionals. Learning from established leaders, gaining practical strategies for team building, and understanding how to navigate challenges will be invaluable experiences. I'm also excited about the chance to collaborate with peers who bring diverse perspectives.

To me, a great leader is someone who listens actively, leads with purpose, and creates an environment where others can thrive. Leadership isn't about having all the answers—it's about fostering a culture of growth, making thoughtful decisions, and empowering those around you to reach their full potential.

Lynsy B. Friend, BS, ACS, RCS, FASE,
Dartmouth Hitchcock Medical Center, Lebanon, NH

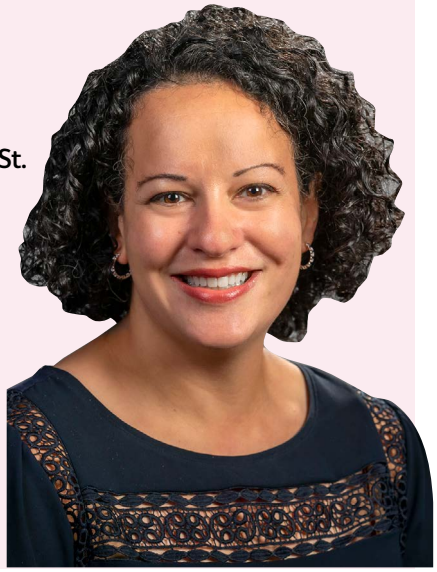
I look forward to strengthening relationships with sonographers and physicians within our cohort and beyond. Working together and sharing our knowledge and experiences will help us improve issues in our institutions and across the echocardiography field. The Leadership Academy will help lay the foundation for achieving these goals.

Good leaders recognize their team's strengths and abilities and can foster the skills to build team cohesion. They encourage learning and a growth mindset and build trust to help achieve team goals and enhance team value and contribution to the organization. Good leaders know they can't do everything alone and that the path to success relies upon the strength of their team.

I am most looking forward to getting to know fellow upcoming leadership with the cardiology community and the American Society of Echocardiography. I am also thrilled to participate in interactive learning that will improve my understanding of my fellow cohort members AND be immediately applicable to my every day work.

A good leader to me is a great listener, and is curious. A good leader has the best interest of their team (and in medicine, the patient) at the forefront, They are willing to make hard decisions and have hard conversations if it is what is best for the team and the patient.

Joyce Johnson, MD, MS, FASE,
Johns Hopkins All Children's Hospital, St. Petersburg, Florida



Kyle Lehenbauer, MD, FASE,
Saint Luke's Mid America Heart Institute, Kansas City, MO

Watching the prior leadership academy cohorts grow into outstanding young leaders in the field of echocardiography has been truly inspiring. Through exposure to the key principles of leadership theory and building relationships within my own cohort as well as with current leaders within ASE, I hope to gain the skills necessary to continue pushing patient care innovations and the field of echocardiography forward on both local and national fronts. I hope to use the skills obtained from this course to help my teams become peak performers.

A good leader is someone who can unify a group of diverse opinions to achieve a common goal. Good leaders are not necessarily the loudest, but rather understand the needs of the team and how to adapt leadership styles to motivate every team member effectively.

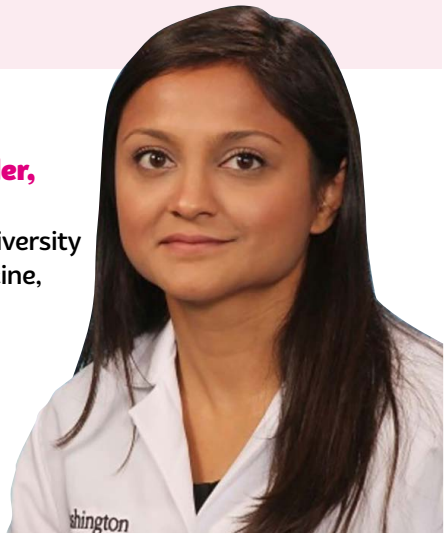
Andrew Peters, MD, FASE,
Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, PA

I hope to learn specific skills in conflict management and resolution. I look forward to learning from ASE leadership and my fellow cohort members.

A good leader is someone who supports his/her team members in their role. They foster the growth of those around them. They unite a group to achieve a common purpose.

I am especially excited about the ASE Leadership Academy because it offers a structured program that is essential for professional growth at any career stage. The opportunity to develop leadership skills in a supportive and collaborative environment is invaluable. Through this experience, I hope to refine my skills and apply them not only within ASE but also at my institution to drive positive change.

To me, a good leader demonstrates strong communication, empathy, and decisiveness while fostering an environment where team members feel valued and empowered. Leadership isn't just about holding a position of authority—it's about inspiring others, building a shared vision, and driving meaningful change. A great leader also adapts to challenges,



Nishath Quader, MD, FASE,
Washington University School of Medicine, St. Louis, MO

listens to diverse perspectives, and continuously strives for growth both personally and within their team.

Karl Richardson, MD, FASE,
Wake Forest Baptist Medical Center, Winston Salem, NC

The ASE has already been a venue to collaborate across institutions, but the Leadership Academy is poised to give me a particularly unique opportunity to work closely with and learn from a group of highly motivated future leaders within the society. The educational schedule is excellent, and the mentorship opportunities are robust. I am looking forward to diving into a number of healthcare, business, and leadership topics with a group of like-minded and enthusiastic echocardiography professionals.

A good leader is thoughtful, collaborative, and leads by example. He or she does not need to tell you what they are doing well because it can be readily seen. A good leader maintains a focus on the broader mission but is driven by an ethic grounded in professionalism, humanity, and mutual success.

Jeremy Slivnick, MD, FASE,
University of Chicago, Chicago, IL

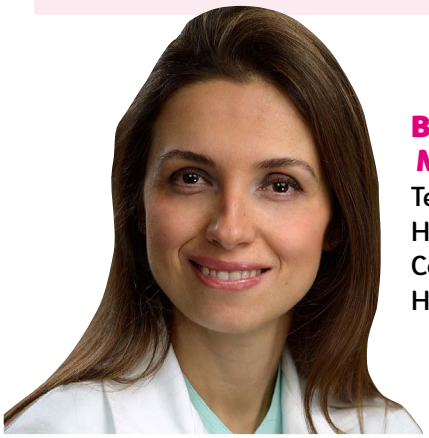
As a member of the ASE Leadership Academy Cohort 4, I am most looking forward to receiving formal training in leadership which will enable me to excel in my future career in academic cardiology. Through this program, I hope to learn the fundamental skills that comprise excellent leaders including strategic decision making, communication, and team management. I am also excited to collaborate with and learn from my cohort members who share my passion for echocardiography and career aspirations.

A good leader understands their team members' strengths and empowers them to reach their full potential in pursuit of shared goals. They actively seek diverse perspectives, acknowledge when they don't have all the answers, and foster an environment of learning and collaboration. Great leaders also encourage autonomy by equipping their team with the confidence and resources to solve challenges independently.

I am eager to gain the skills necessary to be an effective and respected leader in echocardiography, both at my institution and on a national level. I look forward to learning strategies for team building, effective communication, and navigating complex institutional dynamics to drive meaningful change in our echo lab.

A good leader is someone who inspires trust, fosters collaboration, and empowers others to grow while maintaining a clear vision for progress. They lead by example, communicate effectively, and make thoughtful, data-driven decisions that benefit both their team and the institution as a whole.

Parag Tipnis, MD, FASE,
University of Wisconsin, Madison, WI



Betul Yilmaz, MD, FASE,
Texas Children's Hospital, Baylor College of Medicine, Houston, TX

Throughout my career, I have learned that clinical expertise alone does not equate to strong leadership, and leadership is not a skill you are born with but one that develops over time with intentional effort. Moreover, there are different types of leaders, each with the potential to be equally successful. The ASE Leadership Academy not only provides essential training in communication, team building, and conflict management but also helps individuals discover their inner strengths and unique leadership style. These crucial aspects are often overlooked, leaving young professionals aspiring to be leaders in the field of echocardiography with limited resources to cultivate strong leadership abilities. I truly believe this program offers an invaluable opportunity for my professional growth, equipping me with the tools to lead effectively and confidently.

To me, a great leader is not only high-performing but also personable, supportive, and trustworthy. While performance is often the primary focus, true leadership requires balancing excellence with empathy, fostering an environment where team members feel valued and supported. Ultimately, leadership is about more than just achieving results—it's about empowering others, creating opportunities for growth, and helping team members advance in their careers.

ECHO

ASE'S MISSION

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