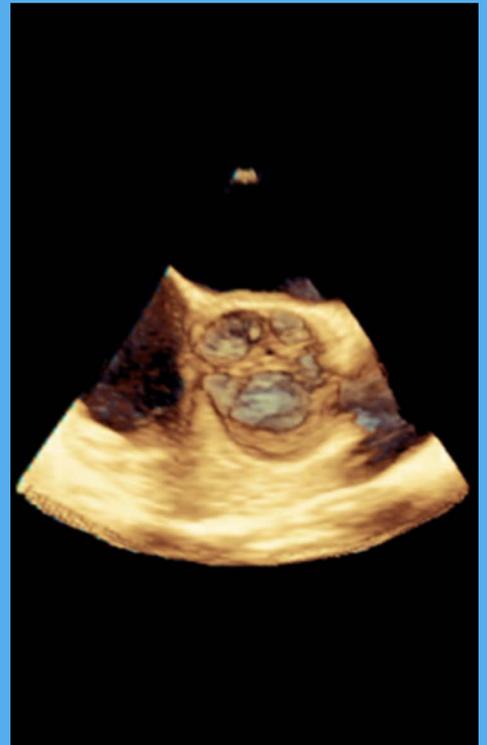
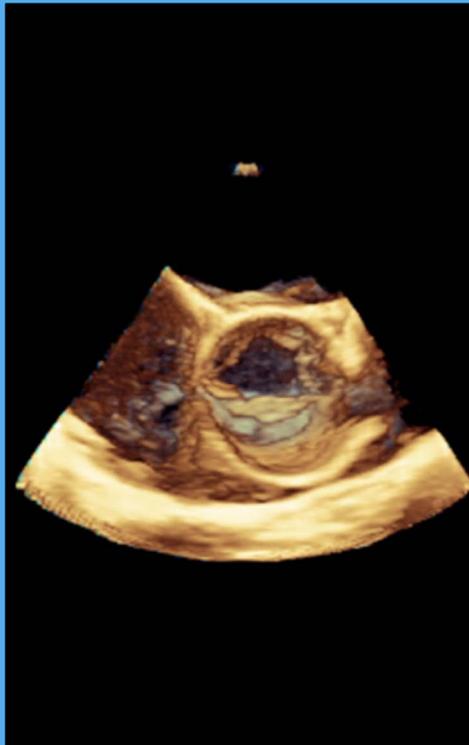
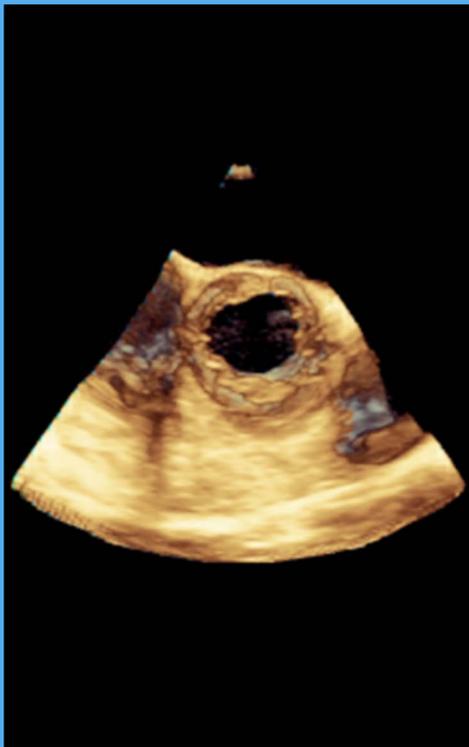


ECHO



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2026/2027 EDUCATION CALENDAR

MAY 2026

27th Annual ASCeXAM Review Course Virtual

Content Available May 4, 2026.

Jointly provided by ASE and the ASE Foundation

JUNE 2026

37th Annual Scientific Sessions

June 26-28, 2026

Gaylord Rockies Resort and
Convention Center, Aurora, CO

Jointly provided by ASE and the ASE Foundation

AUGUST 2026

SAVE THE DATE

6th Annual Advanced Imaging Techniques for Sonographers Virtual Experience

August 29-30, 2026

Jointly provided by ASE and the ASE Foundation

OCTOBER 2026

SAVE THE DATE

Echo Florida

Disney's Grand Floridian Resort & Spa
Lake Buena Vista, Florida

October 17-19, 2026

Jointly provided by ASE and the ASE Foundation

NOVEMBER 2026

SAVE THE DATE

5th Annual Echo in Pediatric & Congenital Heart Disease: Virtual Experience

November 15-16, 2026

Jointly provided by ASE and the ASE Foundation

JANUARY 2027

SAVE THE DATE

Echo Hawaii

January 18-21, 2027

Fairmont Orchid, Kohala Coast,
Big Island, HI.

Jointly provided by ASE and the ASE Foundation

FEBRUARY 2027

SAVE THE DATE

State-of-the-Art Echocardiography

March 12-14, 2027

Westin Kierland Resort & Spa,
Scottsdale, AZ

Jointly provided by ASE and the ASE Foundation

Discounted rates for ASE members.

To learn more and register, visit us at

[ASEcho.org/Education-Events](https://www.asecho.org/education-events).

This text also appears in the January/February
issues of JASE. **[OnlineJASE.com](https://www.onlinejase.com)**

"Lit Up With Love"

Emily Beisel, BS, RCS, Hartford Hospital, Hartford, CT



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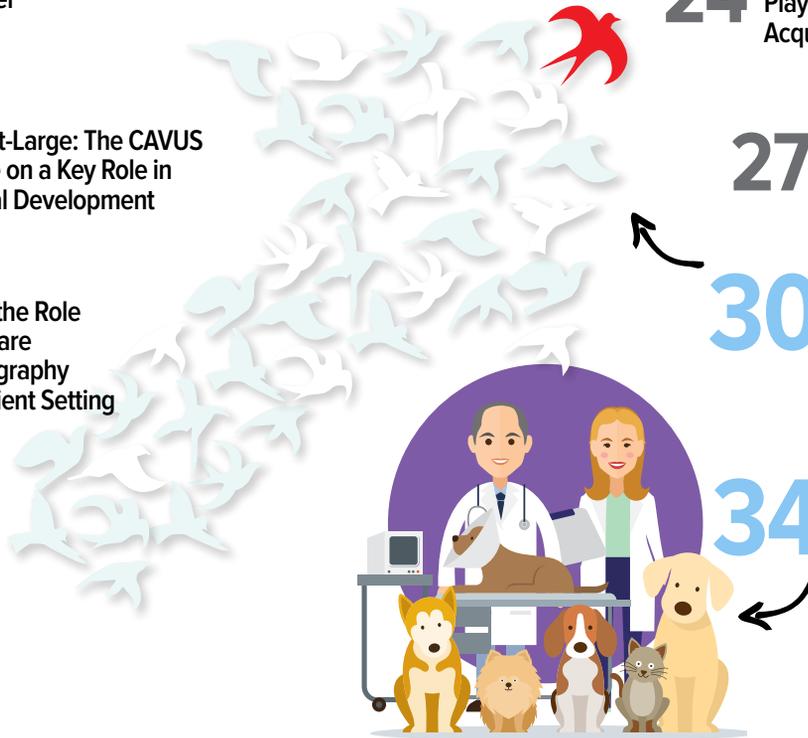
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Cover art: "Cardiac Cycle of a Pentacuspoid Aortic Valve" T. Robert Feng, MD, FASE, Stanford University, Stanford, CA

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 *January*

RESOLVE TO UP YOUR ECHO EDUCATION GAME IN 2026 WITH ASE

Contributed by **David H. Wiener, MD, FASE**, Director of Clinical Operations at the Jefferson Heart Institute and Clinical Professor of Medicine at Thomas Jefferson University, Philadelphia, PA

“Intellectual growth should commence at birth and cease only at death.”

—Albert Einstein

“

Your American Society of Echocardiography (ASE) is the one authoritative source for all your professional education. Our content and the formats through which it is delivered are continuously updated.

Sonographers, physicians, veterinarians, and all professionals engaged in cardiovascular ultrasound are lifelong learners, and your American Society of Echocardiography (ASE) is the one authoritative source for all your professional education. Our content and the formats through which it is delivered are continuously updated. Browse our education offerings and you will find personalizable, flexible approaches specific to your needs, which prioritize active, collaborative learning through a combination of live courses, self-directed learning via webinars, microlearning, and other forms of on-line or asynchronous education.

If you recently attended ASE's Scientific Sessions or any of our live courses, you noticed a shift away from long lectures and passive reception of information. Courses now employ a variety of formats such as case-based education, debates, delivery of smaller and actionable “chunks” of information, interactive expert panel discussions, gamified content, and patient-centered journeys with heart- and imaging-team discussions, to name a few. In our technology-forward field, many courses contain “do-it-yourself” sessions where



mentored experiential learning facilitates acquisition and dissemination of new cardiac ultrasound skills, some offering certificates or microcredentials in the subject matter.

The COVID-19 pandemic accelerated the move to virtual as well as asynchronous, technology-based education formats. A different lesson I learned was the enduring value of live courses. Being in the same room with experts and colleagues provides opportunities for real-time interaction and social/collaborative education which can't be done through videos or online. Being in an immersive learning environment gets one away from day-to-day distractions and allows for full attention on education and skill building. The opportunity for hands-on experience with demonstrations, simulations, or case discussions that deepen comprehension is another benefit. Encounters in the corridors and exhibit halls promote informal education, easy access to ASE's approachable thought leaders, and engender collaboration and career building. I encourage you to re-explore our live courses and see for yourself how we are adapting them to the needs of all learners under ASE's tent.

Opportunities to collaborate and learn interactively abound at ASE's live courses, seen here at the ASE 2025 Scientific Sessions in Nashville, Tennessee.

Echo Hawaii takes place this month on the Big Island and offers a practical, high-level update on the evolving role of echocardiography in diagnosis and patient management. The course emphasizes real-world clinical application through case-based learning and collaborative discussion, as well as targeted workshops, and provides opportunities for personal interaction with internationally recognized leaders in the field. Co-sponsored by the Canadian Society of Echocardiography (CSE) and the Asian Pacific Association of Echocardiography (AAE), the program covers a broad range of cardiovascular disease topics and imaging approaches, with focused sessions on clinical dilemmas and new technology. Attendees will leave with practical strategies to enhance diagnostic confidence and improve patient care.

In February, ASE sponsors "State-of-the-Art Echocardiography" (SOTA) in Scottsdale, Arizona. SOTA 2026 has a new theme with a bold vision

of “Pushing New Limits: Innovation in 3D Echocardiography.” The course will present a fresh focus on cutting-edge imaging technologies that are transforming patient care in valvular heart disease and beyond. Case-based patient journeys explore the entire imaging continuum, highlighting the pivotal role of 3D echo. Leading interventional cardiologists, paired with world-renowned echocardiographers, exemplify the heart team in action; and high-impact workshops feature advanced tips and tricks in image acquisition, 3D manipulation, multiplanar reconstruction, and interpretation designed for immediate clinical application.

Next up chronologically is ASE’s capstone course, the 2026 Scientific Sessions, “Sound Waves and Summits” in June 2026 in Aurora, Colorado. The foremost US cardiovascular ultrasound meeting, ASE 2026 is where colleagues from around the world join for the latest science and technology and to plan the future of echocardiography. The program planning committee has innovative learning opportunities lined up in a new Experience Hub. The Hub will complement the educational sessions by offering more exposure to hands-on opportunities, product demonstrations, along with focused presentations on artificial intelligence in imaging. Also added this year will be virtual reality experiences and a point of care ultrasound (POCUS) full-day workshop. Timed for the end of June and located at a family-friendly upscale resort with many family programs, ASE 2026 is the perfect opportunity for “Learning and Leisure.”

The next live course is Echo Florida, which will take place in October 2026, and will be the last chance to attend this beloved comprehensive review course. The course will re-emerge as a regional course directed by and aimed at sonographers. ASE will be bringing the learning to you at rotating sites, allowing better access and hands-on education for sonographer colleagues around the country.

ASE offers many other education opportunities complementing our in-person offerings. Webinars on a variety of topics are presented live during the year. The opportunity to ask questions of the experts and participate in topic discussions is available to all attendees. These webinars are archived and available to members via the ASE



ASE offers something for every kind of learner and for every area of interest in cardiac ultrasound.

Learning Hub (ALH), where members can also access on-demand content such as recordings of live courses, on-line courses, and microlessons. The ALH also allows you to purchase our physical products; reference guides, posters, pocket guides, and much more. [Browse the Learning Hub](#) to discover the breadth of ASE’s offerings. We host a bimonthly interactive journal club on the “X” social media platform, where ASE guidelines and key scientific publications are discussed in real time by their authors and other experts; and we publish two highly regarded scientific journals, JASE and CASE. Both are peer-reviewed and offer continuing education credits for physicians and sonographers.

ASE offers something for every kind of learner and for every area of interest in cardiac ultrasound. My deepest gratitude to the volunteers and staff who make our educational offerings possible, from ASE’s Education Committee to the course directors and planning committees, the faculty who give of their time and expertise; and of course, to ASE’s education staff headed by our indefatigable Vice President of Educational Activities, Christina LaFuria.

Elevate your echo expertise with ASE—your trusted, comprehensive source for echo education.

This text also appears in the January issue of JASE [OnlineJASE.com](https://www.onlinejase.com)

President's Message for *February*

ASE SUPPORTS AND ELEVATES SONOGRAPHERS



ASE is a unique professional society dedicated to all users of cardiac ultrasound. Forty-five percent of ASE's members are sonographers, who are integral to the vision, work, and governance of ASE. This month's President's Message is authored by Allyson Boyle, MHA, ACS, RDCS, FASE, ASE Board Member, and Chair of the Cardiovascular Sonography Council.

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Sonographers are at the heart of echocardiography, and ASE has long recognized their essential role in advancing cardiovascular imaging and patient care.

Sonographers are at the heart of echocardiography, and ASE has long recognized their essential role in advancing cardiovascular imaging and patient care. Beyond technical expertise, ASE is committed to helping sonographers grow in confidence, expand career opportunities, and develop leadership skills that shape the future of our profession.

BUILDING CONFIDENCE THROUGH EDUCATION AND ENGAGEMENT

Confidence is the foundation for professional growth. ASE provides sonographers with access to world-class education (both live and asynchronous) through webinars, online learning modules, and hands-on workshops at the Annual Scientific Sessions. These resources allow sonographers to stay current with evolving technology, guidelines, and best practices, which translates into greater certainty and patient care.

Education remains central to ASE's mission. For sonographers, this means access to cutting-edge content delivered in flexible formats. ASE's Scientific Sessions offer dedicated sonographer tracks, hands-on learning, and networking events that foster peer-to-peer collaboration. Online resources, including guideline documents, case studies, and interactive modules, make it easier for sonographers to learn at their own pace.

ASE also invests in the future workforce by supporting students and early-career sonographers. Scholarships, mentorship programs, and discounted memberships help remove barriers to entry and encourage professional growth from the very beginning.

FOSTERING CONFIDENCE THROUGH COMMUNITY

ASE fosters confidence by creating spaces for sonographers to share their voices. Through Connect@ASE, members can exchange ideas, ask questions, and collaborate on solutions to common challenges. This sense of community reminds sonographers that they are part of a global network dedicated to excellence in cardiovascular imaging.

Perhaps one of ASE's greatest benefits is the sense of belonging it offers. Sonographers often work in fast-paced environments where collaboration can be limited. ASE provides a platform for connection through councils, committees, and online communities, where sonographers can share experiences, celebrate successes, and find solutions to challenges.

This community fosters not only professional support but also personal confidence. Knowing that your voice matters and that you have a network of peers and leaders advocating for your success is empowering.

LEADERSHIP DEVELOPMENT THROUGH THE ASE LEADERSHIP ACADEMY

One of ASE's most impactful initiatives is the Leadership Academy, designed to prepare members, including sonographers, for leadership roles within ASE and beyond. This program offers structured training in governance, strategic thinking, and communication, equipping participants with the tools to lead effectively. Graduates of the Leadership Academy often go on to chair committees, serve on councils, and even hold positions on the ASE Board of Directors. For sonographers, this is a unique opportunity to move from the scanning room to the decision-making table, influencing policies and shaping the future of cardiovascular imaging.

EXPANDING CAREER OPTIONS

ASE understands that sonographers' career paths are diverse. Many are exploring roles in education, research, and administration. ASE supports these transitions by offering resources such as the Career Ladder document, which helps institutions recognize sonographers' specialized skills and create structured pathways for advancement.

Additionally, ASE provides continuing education and credentialing support, positioning sonographers for roles that require advanced expertise. Whether pursuing a leadership position, teaching future sonographers, or contributing to research, ASE offers the tools and connections needed to succeed.

ADDRESSING ISSUES THAT MATTER MOST

Sonographers face unique challenges, including workforce shortages and ergonomic concerns. ASE advocates on behalf of sonographers at the legislative and regulatory levels, ensuring their voices are heard in conversations about workplace safety.

Through collaborations with other professional organizations, ASE works to standardize best practices and promote policies that protect sonographers' professional interests. Recent advocacy efforts have focused on improving access to education, supporting credentialing pathways, and addressing staffing shortages that impact patient care.

LOOKING AHEAD

As healthcare continues to evolve, ASE remains committed to elevating sonographers by providing tools, education, and advocacy that empower them to lead. Whether through the Leadership Academy, career advancement resources, or addressing issues that matter most, ASE ensures sonographers have a voice and a seat at the table. For those who have not yet explored these opportunities, now is the time. Engage with ASE committees, attend educational sessions, and take advantage of resources designed to help you grow. Together, we can strengthen our profession and continue delivering exceptional care to patients worldwide. Join us in shaping the future—your voice matters.

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

David H. Wiener,
MD, FASE
ASE President



SONOGRAPHER SPOTLIGHT

Carlie Brewer, BS, RDCS (AE, PE), ACS, FASE

Heart Institute, Children's Hospital Colorado, Aurora, CO



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

- Children's Hospital Colorado, Echocardiography Supervisor
- Red Rocks Community College, Pediatric Echocardiography Instructor

When and how did you get involved with cardiovascular ultrasound and who inspires you now?

Shortly after I graduated from Colorado State University in 2007 with a bachelor's degree in Exercise Science, I started my career as an Exercise Physiologist and was fortunate to work alongside some incredibly talented cardiac sonographers in the stress lab. I became fascinated with the way ultrasound could be used to help patients and decided to go back to school to become a cardiac sonographer. Shortly after sonography school, I was fortunate to start my career at Children's Hospital Colorado as a pediatric cardiac sonographer and found my true passion which is serving the pediatric population.

I am continually inspired by my brilliant colleagues that I work alongside as well as the patients that benefit from our expertise.

How did you get involved with the ASE and why do you continue to volunteer?

I initially became involved with ASE when I attended my first Scientific Sessions in Portland in 2014 which was incredibly inspiring. Shortly after in 2015, I became a member of ASE. Early in my career, I focused the majority of my time and energy on quality improvement and was

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I find that being involved with ASE is incredibly inspiring and rewarding and am looking forward to continuing to volunteer my time in an effort to contribute as much as I can to the cardiac sonographer generations to come.
”

invited for several poster presentations at various ASE Scientific Sessions over the years. I then set more of my focus on volunteerism and education and was awarded the FASE designation in 2020. In 2023 I was able to participate as a mentor in the ASE Mentor Match Program which was very rewarding as I was able to connect with a very talented sonographer in the field of sports research echocardiography.

I am thrilled to be on faculty for the first time at the 2026 ASE Scientific Sessions in Colorado and hope to continue to become more involved with ASE in the years to come. I find that being involved with ASE is incredibly inspiring and rewarding and am looking forward to continuing to volunteer my time in an effort to contribute as much as I can to the cardiac sonographer generations to come.

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

Currently my role within the ASE will be faculty at the 2026 Scientific Sessions in Colorado for two Scan with Me hands on learning sessions. I attended the ASE Foundation Research Awards Gala in 2025 in Nashville and would love to become more involved with the Foundation as well.

What are some of the changes you have seen in echocardiography since you started your career?

I think that one of the biggest changes I've seen in echocardiography since I started as a cardiac sonographer in 2011 is the advancement of technology and am looking forward to seeing what the future holds for sonography. Artificial Intelligence is very intriguing to me and how that could potentially help sonographers become more efficient as well as seeing what advancements come in congenital 3D echo.

What is your vision for the future of sonography? What do you see on the horizon that invigorates you?

My vision for the future of sonography is to continue advancing the field with the creation of additional opportunities for advanced sonographers and in particular pediatric cardiac sonog-

“

Your career is what you make of it and involvement with ASE is a surefire way to stay on the forefront of advancements and opportunities within our field.

”

raphers. I would love to advocate and be on initiatives like creating and implementing an advanced credential for pediatric cardiac sonographers or creating avenues for sonographers to advance into leadership roles. For me, it is invigorating to educate future and new sonographers and I'm excited to be able to do so at the 2026 Scientific Sessions.

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

My advice is to network with local sonographers and echo societies and attend scientific sessions. In addition, there are so many opportunities to help with educating students at the collegiate level as well as sonographers within the community. Your career is what you make of it and involvement with ASE is a surefire way to stay on the forefront of advancements and opportunities within our field.

Members-at-Large: The CAVUS Perspective on a Key Role in Professional Development

Contributed by **Nupoor Narula, MD, MSc,**
Weill Cornell Medical College, New York, NY



These positions permit growth within a designated Council and the broader Society and provide an effective means to integrate interested and highly motivated early career faculty and sonographers.

MEMBERS-AT-LARGE on ASE Councils serve as key representatives of the general membership, with multiple participatory roles in council initiatives, including the creation and development of educational resources, council representation in other committees, and contribution to the Scientific Sessions. These positions permit growth within a designated Council and the broader Society and provide an effective means to integrate interested and highly motivated early career faculty and sonographers. I spoke to three outstanding individuals on the Circulation and Vascular Ultrasound Council (CAVUS) who serve or have served as members-at-large on CAVUS, including Dr. Matthew Vorsanger (CAVUS Chair, New York University), Dr. Rebecca LeLeiko (CAVUS Chair-elect, Emory University), and Dr. Alexander Sullivan (CAVUS Member-at-Large, Vanderbilt University).

How did you transition into a member-at-large role on CAVUS?

Dr. Sullivan: I became integrated and interested in ASE during the 2023 ASE Scientific Sessions while a fellow-in-training. At this time, I assisted Drs. Vorsanger and Leleiko in creating a CAVUS podcast on the importance of vascular ultrasound and the role of CAVUS in ASE. I transitioned from a fellow-in-training role on the council to a member-at-large in June 2025 after the completion of my fellowship.

Dr. Vorsanger: A phenomenal mentor asked if I would

be interested in giving a talk at the 2016 ASE Scientific Sessions. Through this experience, I met members of CAVUS and subsequently had the opportunity to join the council as a member-at-large. It has been humbling and thrilling to be on the steering committee, through which many opportunities have arisen.

Dr. Leleiko: I was excited and encouraged to participate in the council as a member-at-large by one of my excellent mentors and colleagues, the year prior to which I had been invited to give a talk.

Dr. Matthew Vorsanger

*(CAVUS Chair,
New York University)*



What educational content have you been involved in as a council member-at-large?

Dr. Sullivan: I have presented at the Scientific Sessions each year since 2023 and look forward to my upcoming ASE presentation in 2026 in Colorado. Most recently, I look forward to serving as ASE's representative on the Suspected Upper-Extremity Deep Vein Thrombosis document in collaboration with the American College of Radiology.

Dr. Vorsanger: In addition to my role at the Scientific Sessions each year, a recent [Echo magazine](#) article by my colleague on the CAVUS Council, Stavros Agorastos, MHA, RDCS, RVT, highlighted a concept I feel passionate about – a dual modality echo-vascular laboratory.

Dr. Leleiko: One of my biggest roles and one of our

most successful collective achievements has been the ASE Registered Physician in Vascular Interpretation (RPVI) course, which was a true labor of love.

Can you give an example of how being a council member-at-large has cultivated your growth and/or trajectory within ASE?

Dr. Sullivan: Being a member-at-large within CAVUS has taught me to be very comfortable in sharing my perspective. We are a tight knit group – and always on the same team – and our communications have allowed me to see how we can effectively contribute in different ways. My practice is multi-disciplinary, and this cross-pollination is what I value in CAVUS and at ASE.

Dr. Vorsanger: Having the chance to participate in a Society at an organizational level so soon after training was never something I imagined I could or would do! I saw how leaders complete tasks and mentored me in my professional growth – and I hope to do the same for junior faculty – including as sponsoring them as a member-at-large.

Dr. Leleiko: I feel that participation in ASE, including as a member-at-large, has truly fostered my academic growth and commitment through an array of opportunities (including a recent JASE publication on performing a comprehensive carotid duplex examination). ASE is the organization I am most involved in – and I have been able to participate in a variety of roles, including as a Scientific Sessions representative.

What key leadership skills has the member-at-large role allowed you to take back to your home institution?

Dr. Vorsanger: I was very fortunate to be a part of the second cohort of ASE's Leadership Academy. Two things stand out to me from this experience: (1) The ability to network and collaborate with others in the echo/vascular ultrasound space, and understand the challenges they face, (2) The high-yield topics in the curriculum, including project management and conflict resolution – necessary skills if you would like to be viewed as a national or institutional leader. It was incredible to get this leadership training as I was transitioning from a member-at-large to track co-chair for the ASE Scientific Sessions. This theme is emblematic of ASE: there are different supportive paths as you mature as a professional.

Dr. Rebecca LeLeiko

(CAVUS Chair-elect,
Emory University)



Dr. Leleiko: The opportunity to speak, be involved, have a seat at the table, and see how things are done from a multitude of perspectives – as a moderator, chair, and panelist – is invaluable. We have started an inpatient vascular lab at our institution, and I have valued my CAVUS connections during such an endeavor.

Has your role as a council member-at-large facilitated your access to mentors and collaborators?

Dr. Sullivan: Being in this role has exposed me to an entirely different academic community. It has opened so many connections that I am grateful for, especially now as a faculty member. During the last ASE Scientific Sessions, this collaboration was very visible through discussions with surgeons, non-invasive cardiologists, and vascular medicine specialists.

Dr. Vorsanger: Certainly. We are a small community. Individuals that I have met at ASE that have preceded me are those to whom I have looked for guidance in my projects.

What advice do you have for early career faculty who wish to integrate further into ASE? How would being a council member-at-large be an effective transition?

Dr. Sullivan: As a fellow-in-training or very early

career faculty, it can be intimidating to get involved in a national society. However, at this stage, you bring a unique perspective of both wishing to learn and having your finger on what's coming next. Stepping in and proposing a session early is a great way to contribute. This allows you to find your community and simultaneously share your voice and perspective.

Dr. Vorsanger: There are so many opportunities to volunteer with ASE, whether as part of steering committee or as a council member-at-large. A council representative can be a great way to get your name out and make your interest known. We truly appreciate collaborating with interested and committed members.

Dr. Alexander Sullivan

(CAVUS Member-at-Large,
Vanderbilt University)



Dr. Leleiko: I think, without a doubt, to be a member of a group which is dedicated to a specific cause – and to have the ability to share the collaborative fund of knowledge and experiences of individuals at different stages of their careers is invaluable. This involvement is a key stepping-stone to do bigger and greater things within the Society. One of the first ways to get involved is as a council member-at-large, from which you can get pulled into other committees and opportunities.

Expanding the Role of Critical Care Echocardiography in the Inpatient Setting

Contributed by **Sahar Ahmad, MD**, Renaissance School of Medicine at Stony Brook University, Division of Pulmonary, Critical Care & Sleep Medicine, Stony Brook University Hospital, Stony Brook, NY; **Harry D. Kuperstein, BS**, Renaissance School of Medicine at Stony Brook University, Stony Brook, NY; **Jonathan Aminov, BS**, Renaissance School of Medicine at Stony Brook University, Stony Brook, NY



It is prudent to preserve availability of cardiac sonographers in the hospital and the cardiologists reading echocardiograms, both valuable inpatient resources.

HOSPITAL-BASED PHYSICIANS assuming care of new, unfamiliar inpatients under time constraints may reflexively jump to ordering formal echocardiography studies without considering the amount of time passed since a historical echocardiography report. A similar concern may arise during a prolonged hospitalization upon shift change when a new primary inpatient hospital physician assumes care of a patient. The 2019 Appropriate Use Criteria (AUC) for Multimodality Imaging in the Assessment of Cardiac Structure and Function in Nonvalvular Heart Disease supports that repeat echocardiography is rarely ever indicated for patients with asymptomatic or stable symptoms, and in many but not all cases indicated for patients with new symptoms, worsening symptoms, or to guide therapy.¹ Anecdotally, many patients receive repeat transthoracic echocardiography (TTE) at our institution, either during the same admission or after a readmission in close proximity, even if there is no change in severity or quality of symptoms, or any new symptoms are most plausibly not cardiac in nature. Literature supports that for a second TTE completed during the same hospitalization, the frequency of new abnormal findings decreased from 44.7% to 15.1%, with less frequent changes in

clinical management, though the majority of these repeat TTEs were still deemed appropriate by AUC.² A 2023 study implementing EMR alerts for repeat TTE orders within 90 days failed to reduce repeat TTE order attempts per month, with interviewed residents requesting further education on the subject, suggesting a gap between the guidelines and practice of inpatient physicians.³

Guidelines for frequency of serial TTE in outpatient populations are well-established, such as in patients with valvular heart disease.⁴ However, guidelines for repeat TTE between admissions or during the same, extended admission do not exist. Additionally, unlike patients with heart disease being managed by cardiologists in the outpatient setting, general internists often bear the responsibility of ordering TTE and may not be up to date with American Society of Echocardiography (ASE) guidelines. It is prudent to preserve availability of cardiac sonographers in the hospital and the cardiologists reading echocardiograms, both valuable inpatient resources. Unnecessary inpatient echocardiography studies may also contribute to further burnout among cardiac imaging specialists. A 2022 study of cardiac imaging specialists on burnout demonstrated that 68% of respondents cited “heavy workload” as a major contributor to burnout.⁵ To address these concerns, we must explore not only the role for guidelines and further research on repeat TTE in the inpatient setting, but the role of critical care echocardiography (CCE), that is, limited views directed for clinical decision making, performed by hospital practitioners at the point of care.

Hospital-based physicians should consider a patient’s baseline clinical status and the specific clinical question they are looking to answer when ordering TTE in the hospital, and whether focused cardiac ultrasound could suffice in these instances. The [2013 ASE Recommendations for Focused Cardiac Ultrasound](#) support the use of bedside focused cardiac ultrasound to assess a broad range of cardiac pathology.⁶ However, in the interceding 12 years since those recommendations, residency and fellowship programs have improved their ultrasound education and institutions have

A 2022 study of cardiac imaging specialists on burnout demonstrated that 68% of respondents cited “heavy workload” as a major contributor to burnout.

improved the availability of point-of-care ultrasound (POCUS) machines, suggesting an even broader use for focused cardiac ultrasound than the prior recommendations allude to. As education and functionality of portable machines enhance, judicious ordering of repeat TTE for inpatients should follow.

A useful aspect to having an existing TTE previously performed in the hospital is the easy accessibility to the corresponding TTE study videos through an institutional Picture Archiving and Communication System (PACS) system. Focused cardiac ultrasound can be compared to formal echocardiography images to make either visual or quantitative comparison at the bedside. Much like how electrocardiograms and chest X-rays are compared side-by-side, a formal echocardiography can serve as a visual comparison to guide focused cardiac ultrasound, especially for less experienced providers. This may be particularly prudent during overnight or weekend admissions where echocardiography technicians are less available and in high volume tertiary care centers where echocardiogram lab time can be reserved for patients in need of a comprehensive evaluation.

Appropriate substitution of CCE for TTE need not be a standard that is applied universally. Less experienced clinicians may have a

Institutions may consider quality improvement initiatives to identify and reduce the amount of repeat TTE ordered in the inpatient setting during or between admissions.

lower threshold to order a TTE if they cannot answer their specific clinical question with POCUS, while more experienced clinicians may have a higher threshold to order a TTE with their broader skillset. Indeed, a significant barrier to adopting this approach is simply adequate training in POCUS. A 2022 study of VA medical centers found that lack of training was the most frequent barrier to POCUS use.⁷ However, with more medical schools, residencies, and fellowships improving their POCUS training, we expect this obstacle will be overcome.

TTE in the hospital remains an extremely valuable diagnostic tool to at once obtain both a structural assessment of a patient's cardiac function and an understanding of any acute derangement to act on. However, its ease of ordering may lead to inappropriate serial TTE in the inpatient setting. While CCE training improves across institutions and access to ultrasound machines at hospital centers grows, it is time to consider a greater role for focused cardiac ultrasound performed by the primary or consulting teams to answer specific clinical questions rather than reflexively ordering unneeded comprehensive examinations. Institutions may consider quality improvement initiatives to identify and reduce the amount of repeat TTE ordered in the inpatient setting during or between admissions. Further research on the matter and society recommendations on the frequency of inpatient TTE may also guide efforts to reduce inappropriate testing and preserve hospital resources to

ensure timely echocardiography studies for patients who need it. An updated set of recommendations for CCE for inpatient physician use could be pursued, accounting for the advent of the National Board of Echocardiography Examination of Special Competence in Critical Care Echocardiography as a means of ensuring quality, and drawing from both the critical care (Mayo 2009)⁸ and cardiology (Kirkpatrick 2020)⁹ avenues of recommendations. Certainly, these authors are up for that challenge should collaborators emerge.

REFERENCES

1. Doherty JU, Kort S, Mehran R, et al. ACC/AATS/AHA/ASE/ASNC/HRS/SCAI/SCCT/SCMR/STS 2019 Appropriate Use Criteria for Multimodality Imaging in the Assessment of Cardiac Structure and Function in Nonvalvular Heart Disease: A Report of the American College of Cardiology Appropriate Use Criteria Task Force, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and the Society of Thoracic Surgeons. *Journal of the American College of Cardiology*. 2019/02/05/2019;73(4):488-516. doi:https://doi.org/10.1016/j.jacc.2018.10.038
2. Danyluk AB, Winchester DE. Appropriateness and subsequent management of inpatient echocardiograms: An evaluation of low value care. *Am Heart J Plus*. Dec 2021;12:100070. doi:10.1016/j.ahj.2021.100070
3. Anderson S, Engels R, Lee K, et al. Abstract 16357: Reducing Repeat Transthoracic Echocardiograms in the Inpatient Setting. *Circulation*. 2023;148(Suppl_1):A16357-A16357. doi:doi:10.1161/circ.148.suppl_1.16357
4. Otto CM, Nishimura RA, Bonow RO, et al. 2020 ACC/AHA Guideline for the Management of Patients With Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. *Journal of the American College of Cardiology*. 2021/02/02/2021;77(4):e25-e197. doi:https://doi.org/10.1016/j.jacc.2020.11.018
5. Joshi SS, Stankovic I, Demirkiran A, et al. EACVI survey on burn-out amongst cardiac imaging specialists during the 2019 coronavirus disease pandemic. *Eur Heart J Cardiovasc Imaging*. Mar 22 2022;23(4):441-446. doi:10.1093/ehjci/jeac002
6. Spencer KT, Kimura BJ, Korcarz CE, Pellikka PA, Rahko PS, Siegel RJ. Focused cardiac ultrasound: recommendations from the American Society of Echocardiography. *J Am Soc Echocardiogr*. Jun 2013;26(6):567-81. doi:10.1016/j.echo.2013.04.001
7. Williams JP, Nathanson R, LoPresti CM, et al. Current use, training, and barriers in point-of-care ultrasound in hospital medicine: A national survey of VA hospitals. *J Hosp Med*. Aug 2022;17(8):601-608. doi:10.1002/jhm.12911
8. Mayo PH, Beaulieu Y, Doelken P, et al. American College of Chest Physicians/La Société de Réanimation de Langue Française statement on competence in critical care ultrasonography. *Chest*. Apr 2009;135(4):1050-1060. doi:10.1378/chest.08-2305
9. Kirkpatrick JN, Grimm R, Johri AM, et al. Recommendations for Echocardiography Laboratories Participating in Cardiac Point of Care Cardiac Ultrasound (POCUS) and Critical Care Echocardiography Training: Report from the American Society of Echocardiography. *J Am Soc Echocardiogr*. Apr 2020;33(4):409-422.e4. doi:10.1016/j.echo.2020.01.008

Interview with Dr. Stephanie Fuller – Strengthening the Relationship between the Sonographer and Surgeon

Contributed by **Tracy Ralston, RDCS, FASE**, and **Jessica Monteagudo, RCS**, of Duke University Medical Center, Durham, NC



Cardiac surgery not only had the technical challenge and dexterity with your hands, but also the creative and intellectual challenge of understanding the anatomy and physiology.

STEPHANIE FULLER, MD, MS, is a board-certified cardiothoracic surgeon. She joined the Children's Hospital of Philadelphia in 2008 and became Professor of Clinical Surgery at the University of Pennsylvania and Program Director of Congenital Cardiothoracic Surgery at Children's Hospital of Philadelphia. In December 2025, she became the Chief of Pediatric Cardiothoracic Surgery and Co-Director of Blalock-Taussig-Thomas Heart Center at Johns Hopkins University in Baltimore, Maryland.

You were on your way to start a PhD in Art Restoration when you applied for medical school. What was your inspiration for the switch?

I always thought about going into medicine and becoming a physician. In all honesty, I have so many diverse interests in life. It's the question you get all the time: why go into medicine? And the answer is to help people. Often times we are discouraged from giving that as an answer as it is not specific enough. In my case it really was a matter of wanting to help people. I'm fortunate that a lot of what attracted me to art restoration originally is very similar to congenital heart surgery, where we take these hearts and reform, remodel; almost a combination of architecture and art, to see things in three dimensions, much like a sculptor. Cardiac surgery not only had the

technical challenge and dexterity with your hands, but also the creative and intellectual challenge of understanding the anatomy and physiology. So although it seems very far off, it wasn't such a difficult transition for me.

What attracted you to the field of CT surgery?

Outside of all the compelling intellectual and technical challenges, congenital heart surgery really became an interesting field of medicine. For example, in general surgery, you perform an appendectomy and the patient gets better and it's highly rewarding, but you don't really have the continuity of care. Now, there exist surgical professions which allow you to establish continuity of care with patients. There are areas in the profession of surgery where we've developed and gained from that continuity of care with the patients. There is probably no better example of that than the field of congenital heart surgery where we have the opportunity to really watch these families grow and develop. Some of our basic surgeries are one-and-done, but a lot of them tend to maintain some degree of familiarity with many of our families.

What are the similarities of surgery to art?

Obviously there is the three dimensional aspect of it, the ability to go in and think in terms of three dimensions and how you reconstruct things. Then there is such a refined technique to it and very detail-oriented which is one of the nice things as well. We get concerned with not only how things are going to function, but also how are they going to look. That is one of the appeals to it, just like art.

You use virtual heart models where we use 3D reconstructed models. Can you tell us more about that?

I am just learning more about that here at Hopkins and what the preferred methods are. Realistically, the ideal heart center would use a little bit of both. The printing can be time-consuming and can also be expensive. I think the advantage in some ways of virtual reality is that you can look at things in a bunch of different ways, from different angles and approaches, but unlike 3D printed hearts, you can't actually hold it in your hand and explore by tactile sensation.

I think it is always valuable to us to have open communication with the sonographers who are literally at the bedside acquiring the images.

I think both methods are really great, particularly when it comes to intra-cardiac anatomy. You are trying to create a baffle or a VSD closure to an aorta in a remote VSD, for example, these allow us to test different shapes and sizes of patches and how to better reproduce that in the operating room. It is just hugely advantageous. We are so fortunate to be doing heart surgery in the current time. It has really accelerated our understanding and ability and be able to come to the OR much better prepared to fix some of these lesions. I think they're both great techniques and both have a place and I think we are going to see a lot of advances, particularly when it comes to image quality. I think it's going to be easily accessible to everybody, even use it to sit down and explain it to your patients in a way that they can understand.

What is the ideal relationship between CT surgeons and the echo team?

Critical. It's a great question for me right now because I am getting assimilated in a new role here at Johns Hopkins. One thing that is really beneficial is to immediately form relationships with the echo team. It is great to sit down with the sonographers who are just exquisitely talented at what they do and review their images, particularly if an attending is busy. I was looking at some fetal images, and I was just so impressed with the overall quality of the images and the competency of the sonographer performing the study. I think it is always valuable to us to have open communication with the sonographers

who are literally at the bedside acquiring the images. We rely upon sonographers so heavily for the type of images, what specifically we're looking for, and what the questions are; and having that discussion is really important. The same goes for the fellow and attendings in the operating room. The imagers do so much to facilitate our jobs.

Is there something that sonographers can do to make that relationship easier?

I know cardiac surgeons can be intimidating so making sure echo techs, even if you're new in your role, ask questions and be inquisitive. Don't be afraid or intimidated to say, "hey I got this request, but what specifically were you looking for" or "what can I help you to see?" I think this is really valuable and establishes such a nice relationship which isn't us just telling you what to do, it is more us asking what we need. It also helps us to learn new vocabulary and language. We won't always know which angle or images to ask for specifically. So, learning about technique is really helpful. It is always nice to pass an experienced echo tech in the hallway and hear "Hey I did that post-op of yours and it looked really beautiful."

How do you handle the stress and pressure of being a surgeon?

I think it's really important that everyone has outlets. This is a very stressful job in general for all of us involved in pediatric healthcare. I think some of that has been made more challenging over the last several years by limitations, by decreased funding to pediatric care. We tend to work hard outside the hospital with academic responsibilities, research, etc. I think realistically having an outlet with something you enjoy doing where you can completely escape and get your mind off work is incredibly beneficial. And it's important to have a support structure around you, whether it is the people at work with whom you heavily rely. You can just close the door and have an open conversation. Or your family at home, I know I could never do my job without the support of my husband, he is absolutely amazing. Having people in our lives who want us to succeed and really support us in getting there is so important.



Stephanie Fuller, MD, MS

You were able to attend part of the ASE Scientific Sessions in 2025. Did that give you new insight into the field of echocardiography?

Yeah it really did. It was my first time attending the meeting and I absolutely loved it! The tenor and culture of the meeting was very different from surgical meetings. It was widely attended, well moderated, and really active audience participation. I was so impressed by the quality of the talks but also the quality of the moderation, where the moderators were great at getting people involved. They were circulating the conference floor, asking questions and pressing a little more on the questions being asked. It was hugely educational. It was a great forum to connect with people. I really enjoyed going to the veterinary sessions as well. I have done some work with the vet team at the University of Pennsylvania and I am really fascinated by the parallels between human and animal cardiac anatomy and physiology. The overall quality of the meeting was exceptional.

In a previous interview with Society of Thoracic Surgeons, you stated that your approach to leadership is evolving, can you expand on this: Also, one of my favorite quotes of yours is that leadership is “the opportunity to bring value to others.” Can you explain how you do this?

I’m in my first major leadership role as the Co-Director here at Hopkins. It has been an incredibly warm welcome. The attitude I have towards leadership is one of servitude and one of embracing the culture that everyone has a role to play and everyone contributes to the health and wellness of our patients. I have been really grateful to encounter an exceptional culture at Hopkins. I think it is important as a new leader to get to know the people in the cardiac center and to know what their career goals are, and how to facilitate getting them there. Everyone is working hard and needs to feel valued. It’s important that leadership is supportive. A few small things make a big difference. Gratitude is important in bringing value to others. So is recognition of hard work. The last meaningful step is going to be a little bit more tangible by being able to provide them with the tools, personnel and time they need to do a better job.

What advancements in echo technology have had the most significant impact on your surgical practice?

I think 3D echo by far. Seeing the valve exactly the way we see them in the operating room has been incredible for us. It has been a game-changer for mitral and tricuspid valve repair. The work I was doing for CHOP and what is probably going to be interesting down the road is how we are able to better assess ventricular remodeling, particularly after surgical interventions.

What advice would you give aspiring sonographers who want to be highly effective partners to surgical teams?

You have to be a sponge, just learn as much as you can. Come to the operating room and watch the operations in order to have a better understanding of what you’re looking at on the echo. Be active, be a participant and don’t be shy. Study your craft and have a goal of mastery. Make sure you communicate with people about what could be challenging about

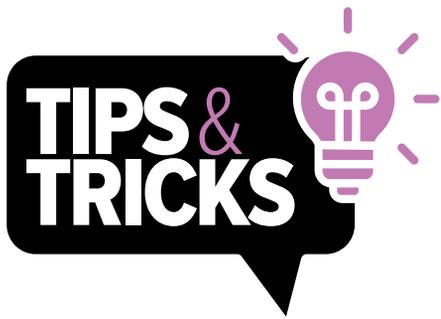
You have to be a sponge, just learn as much as you can. Come to the operating room and watch the operations in order to have a better understanding of what you’re looking at on the echo.

your role. Reach out to those around you. I think it’s a great career, if I wasn’t a surgeon I would definitely be an imager.... Or an art restorationist!

We love that you are involved with rhino conservation and are also an avid equestrian. Why rhinos and horses, we would like to hear more about that?

I was raised on a horse farm in Virginia and my sister, and I rode our entire lives growing up. It’s a little hard to get out of your blood. For me, that is one passion where I can also escape. It gives me a nice mental break and is great physical exercise. I got involved in rhino conservation after the World Congress was held in South Africa and I took a week vacation. My dear friend is a conservationist, and I always stayed active in her organization called “Our horn is not medicine.” Rhinos are the wild creatures most often poached and sacrificed for their horn, which is keratin. They are very gentle creatures and have no predators outside of man. It appealed to my love of animals and passion for wildlife. It has been a privilege to stay involved in that organization.

We would like to thank Dr. Fuller for her generosity in giving her time and expertise. It was an absolute pleasure talking with her!



“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 Aortic Isthmus Echocardiography Imaging.



Contributed by **Tracy Ralston, RDCS, FASE,**
Duke University Medical Center, Durham, NC

High PRF: Better Living Through Physics

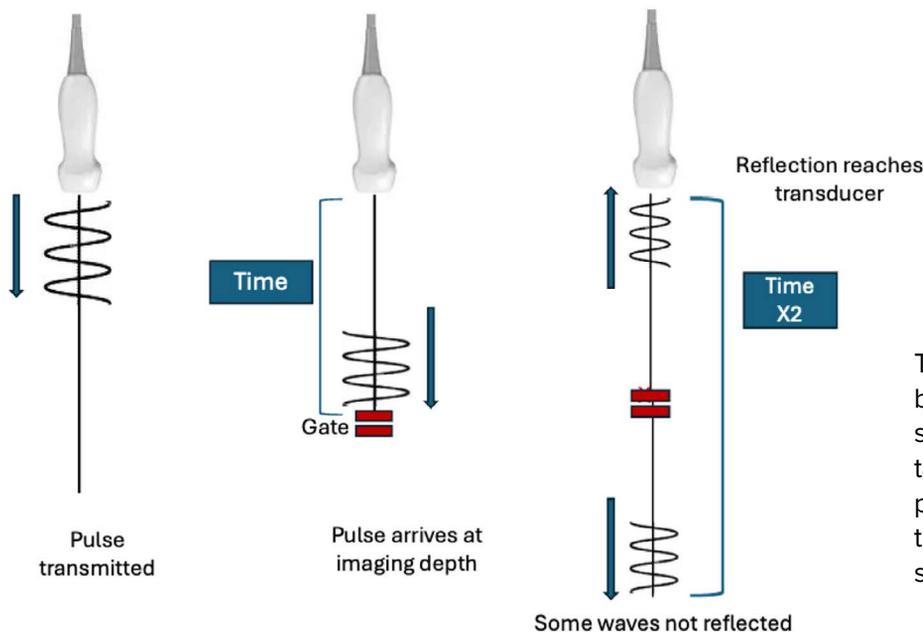
Have you experienced this? You are scanning a stenotic valve with pulse wave, but when you go to spectral Doppler, your scale aliases and you cannot see the maximum value. If you switch to continuous wave Doppler, it picks up other blood flow tracings and contaminates your signal.

If the answer is yes, then you are going to love high PRF.

High Pulse Repetition Frequency (PRF) allows for the measurement of higher blood flow velocities than standard PW. To understand how best to use pulse-wave Doppler for optimal imaging, let's first review the physics.

Pulsed wave Doppler is created by a short electric pulse applied to a piezoelectric crystal; the deformation of the crystal creates local compression (acoustic pressure) of the tissue with which the crystal is in contact. How often the pulse wave is created is called the repetition rate- also known as Pulse Repetition Rate or PRF.

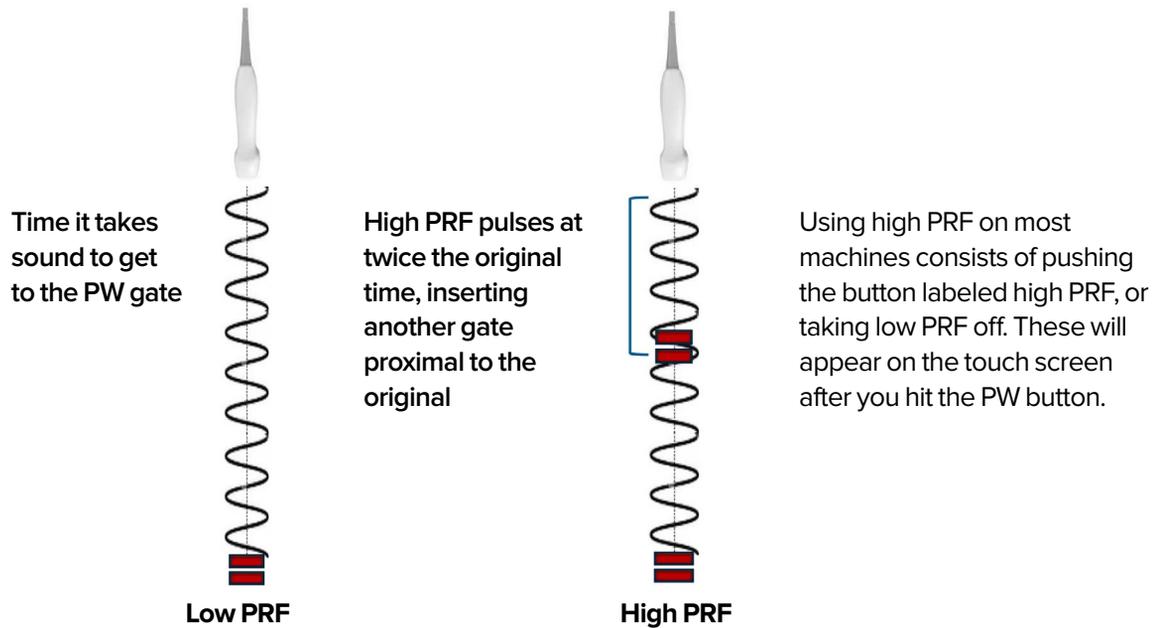
The returning signal is sampled at a fixed time after the transmission, which corresponds to a specific depth (gate or sample volume). This samples the velocity only at the “gate” on your cursor.



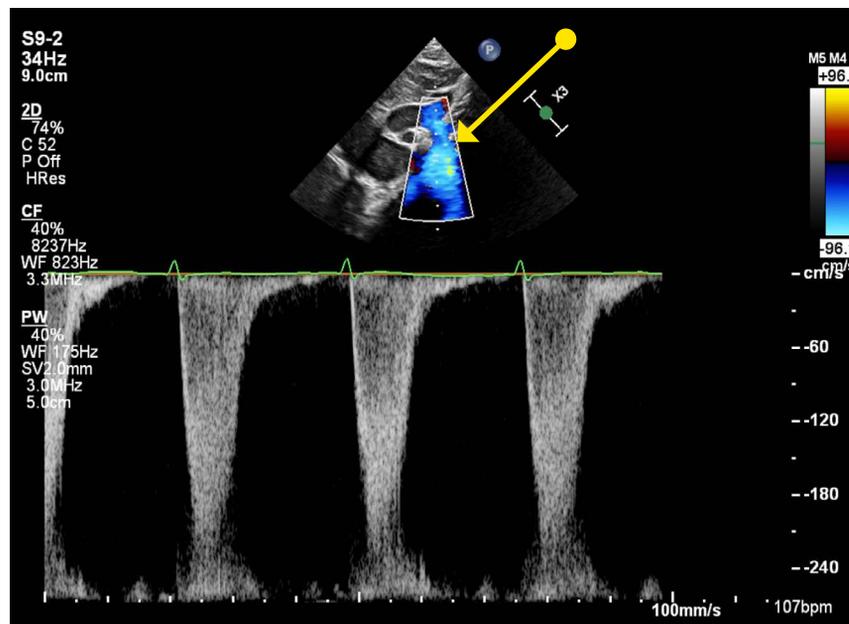
The scale limit is determined by the time it takes for the sound wave to reach the target and return to the probe. If you scan a velocity that exceeds this limit, the spectral Doppler will alias.

The maximum detectable velocity is half the PRF.

High PRF will send out pulse wave bursts more frequently, reducing the time it takes to receive the signal. This enables you to increase your scale and get higher velocity signals. High PRF introduces range ambiguity to increase the maximum velocity that can be detected with PW, but if you position the other “gate” where there is no flow, the spectral Doppler tracing will be accurate.

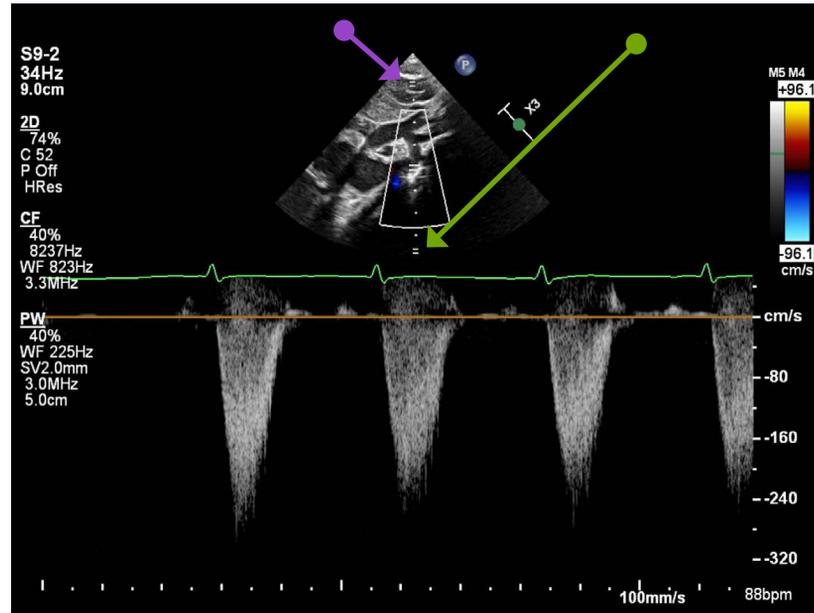


Here is an example of pulse wave aliasing in a descending aorta (yellow arrow pointing at the PW gate)





Same arch with high PRF, the proximal gate (*purple arrow*) is placed in thymus tissue. The distal gate (*green arrow*) is past the spine.



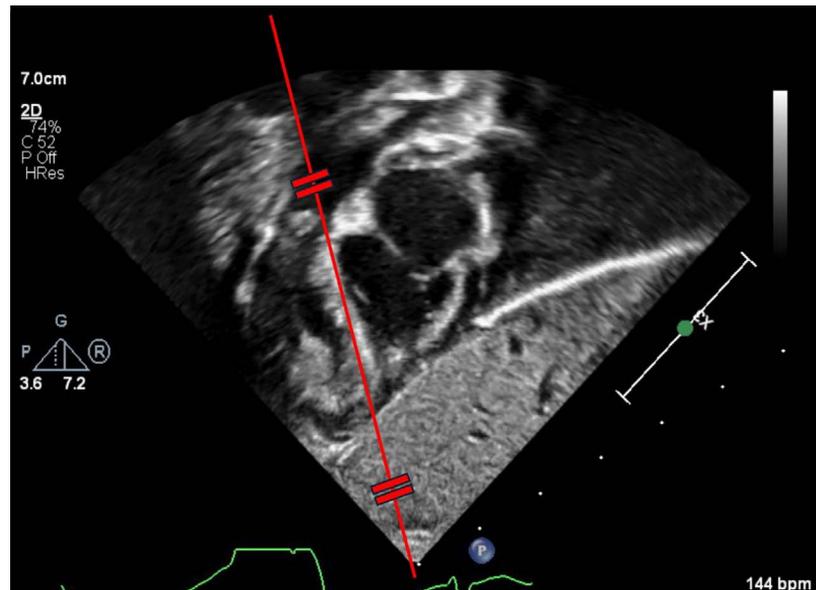
Subcostal sagittal of the pulmonary valve. The original PW gate is distal to the pulmonary valve. High PRF inserts another proximal gate, however, it is in liver tissue, therefore no signal should return from that gate.

Locations to use high PRF

- High parasternal
- Off axis apical
- Subcostal
- Suprasternal

Drawbacks to using high PRF

- It introduces range ambiguity
- Small babies may not provide enough depth to introduce another sampling gate.
- High PRF has the potential to underestimate peak velocities as the signal from the current pulse can arrive after the next pulse has been sent.



In summary, we can use high PRF to find the location of maximum velocity with pulse wave Doppler without spectral Doppler aliasing, while eliminating acquiring wave forms from other sources of blood flow that you would get by using CW.

The Perioperative TEE Playbook: Tips for Accelerated Acquisition and Analysis

Contributed by **Loren Francis, MD, FASE**, Medical University of South Carolina, Charleston, SC, and **Himani Bhatt, DO, MPA, FASE**, Icahn School of Medicine at Mount Sinai, New York, NY



This guide focuses on efficient placement, rapid troubleshooting, and advanced optimization techniques essential for providing superior diagnostic value when seconds count.

TRANSESOPHAGEAL ECHOCARDIOGRAPHY (TEE) is the definitive real-time monitoring tool in the perioperative and critical care setting. This guide focuses on efficient placement, rapid troubleshooting, and advanced optimization techniques essential for providing superior diagnostic value when seconds count.

1. Probe Placement

In the perioperative setting, safe and rapid placement is crucial, especially in intubated, critically ill, or sedated patients.

- **Deflection Check Prior to Insertion:** Always confirm the probe's mechanical integrity by checking the flexion and rotation wheels before entering the oral cavity. Ensure the probe is not locked into a fixed position. Anteflex slightly to be consistent with the path of the oropharynx.
- **Suction stomach prior to probe insertion:** As air is often inadvertently introduced into the stomach with mask ventilation after anesthetic induction, routine suction with and subsequent removal of an orogastric tube (OGT) may improve image quality. However, risk and benefits

must be considered in patients with baseline coagulopathies as the OG tube insertion may be traumatic and result in further complications.

- **The Coordinated Jaw Thrust Technique:** For patients with challenging pharyngeal anatomy or limited neck mobility, leverage your assistant. Request an experienced assistant to perform a two-handed jaw thrust. This maneuver effectively lifts the tongue base and anteriorly displaces the mandible, widening the pharyngeal space and minimizing the chance of the probe coiling or obstructing at the cricopharyngeus muscle.
- **Optimal Neck Positioning:** Reinforce the fundamental positional adjustments. Encourage or manually facilitate neck flexion (“chin toward chest”). This move straightens the acute angle between the pharynx and the esophagus, reducing resistance at the upper esophageal sphincter. Maintain this position until the probe tip passes into the upper esophagus.
- **The Intubating Blade Maneuver (Last Resort):** When conventional methods fail due to a bulky tongue or severely challenging anatomy, use a Macintosh or Miller intubating blade. This technique provides direct visualization and control:
 - Carefully use the blade to clear the tongue and lift the jaw/epiglottis.
 - This provides a clear path for the probe, which can then be guided directly into the esophagus under visualization, bypassing critical obstructions. *Note: This requires careful technique to avoid injury to oral structures.*

2. Probe Management: Speed and Stability

In the acute setting, minimize probe manipulation and maximize diagnostic certainty.

- **Pre-emptive Stabilization:** Following initial placement, secure the probe to prevent slippage. Minor advancement (1-2 cm) beyond the desired initial view and a gentle pull-back can anchor the probe, stabilizing the image during table movements or patient repositioning.
- **The "Rule of Halves" or Rotation:** When searching for an optimal valve view, use half-turn rotational adjustments coupled with minor flexion rather than large swings. This prevents overshooting the target and reduces search time.
- **Targeted Transgastric (TG) Focus:** Achieve the TG mid-short axis view rapidly for LV vol-

Perioperative imaging requires immediate prioritization of views that impact surgical or hemodynamic management.

ume and function. Utilize minimal antelexion to keep the LV centered and maximize the Doppler angle for VTI measurements—a core component of cardiac output monitoring.

- **Probe location when unused:** It is a good habit to return the transducer to the ME 4-chamber view after active imaging of the patient. This allows the next exam to start immediately at a view that is widely recognized and minimize the time needed for reorientation.

3. Real-Time Acquisition: Actionable Views

Perioperative imaging requires immediate prioritization of views that impact surgical or hemodynamic management.

- **Prioritize the ABC's: Aortic, Bi-Caval, Contractility:** In a crisis, skip the standard 28 views and go directly to:
 1. **Mid-Esophageal (ME) Aortic Valve Short-Axis:** Check for AV mobility and LVOT patency.
 2. **ME Bi-Caval View:** Rapidly assess IVC, SVC and interatrial septum for shunts.
 3. **ME/TG Short-Axis:** Assess biventricular regional and global contractility and volume state.
- **Expedient imaging:** There may be only 15-20 minutes between TEE probe insertion and start of electrocautery use. Therefore, imaging goals must be prioritized to answer any perioperative

questions, establish baseline, and rule-out complications.

- **Color Doppler Precision:** When evaluating regurgitation severity, immediately optimize the Nyquist limit (PRF). Start with the PRF set around 50-60 cm/s to detect high-velocity jets, then reduce to 30-40 cm/s for low-velocity flow (e.g., shunts or diastolic flow). Be careful not to underscale the PRF which can exaggerate regurgitation severity.
- **Pulse Wave (PW) and Continuous Wave (CW) Integration:** Use PW Doppler for low-velocity flows and transition immediately to CW Doppler for high-velocity, quantifiable flows.

4. Acute Optimization: Minimizing Artifact, Maximizing Clarity

2D/Doppler Optimization

- **Gain-Depth Balance:** Always confirm that the posterior pericardium is visualized. If it's too deep or too faint, increase overall gain and ensure the depth is sufficient. In hypovolemic patients, reducing the depth can visually exaggerate chamber size.
- **TGC (Time Gain Compensation) Management:** Use the TGC sliders strategically. Ramp up the gain steeply in the near field (closer to the probe) to compensate for attenuation but pull back the gain in the far field to reduce noise and wall-out artifacts near the posterior pericardium. The goal is uniform brightness across the image depth.
- **Sector Width/Frame Rate Trade-Off:** For assessing rapid phenomena (e.g., flail leaflet, device movement), aggressively narrow the sector width. This dramatically increases the Frame Rate, enhancing temporal resolution critical for tracking fast motion without blurring.
- **Frequency and Focus Integration:** Use the highest fundamental frequency available to maximize axial resolution (detail along the beam path). Ensure the focal zone is strategically placed at the level of the primary pathology.

3D Optimization

- **OPTIMIZE 2D IMAGE:** One of the most important factors in 3D acquisition is getting good 2D images. Bad 2D images make bad 3D images.
 - Adjust the gain: the gain settings are just as important in 3D acquisition as they are in 2D.
 - Change to lower frequency when possible.

One of the most important factors in 3D acquisition is getting good 2D images. Bad 2D images make bad 3D images.

- Make sure you try multiple views to obtain your 3D. Just like 2D analysis, multiple 3D views are also needed to analyze your region of interest.
- **Breath hold:** In an intubated and paralyzed patient, the ventilator may be paused briefly to create a motion-less field conducive of minimizing stitch artifact with multi-beat 3D imaging.
- **Focus on region of interest (ROI):**
 - Choose mode based on goal and region of interest (ROI): make sure you are using the mode based on what you are trying to accomplish. Your ROI should determine your initial selection (full volume, 3D zoom, etc). All modes can be used depending on goal: learn to use all the different modes based on ROI. Try all the modes to get a familiarity and comfort before you select the one needed.
 - Proper rendering and optimization: Make sure you zoom in on ROI. Adjust the depth based on what you are trying to visualize. Reduce the volume size to optimize image and resolution. Choose smallest sector when possible: make sure your sector size is optimized for ROI
- Keep adjacent structures in partial image for orientation: this will allow you to not only retain orientation but also optimize visualization of the entire ROI.
- Requires training and effort: **Practice using 3D!** You need to try using all the modes and learn the knobology to gain experience using 3D; this will enable you to acquire and optimize your images!

THE ROLE OF LIMITED ECHOCARDIOGRAM PROTOCOLS

There has been an increasing demand for transthoracic echocardiograms nationwide, averaging ~3% over a ten year period between 2001 and 2011.¹ At our institution, over the last eight years, there has been an overall 20% increase in annual echocardiogram requests with a concomitant rise in the number of urgent or STAT echocardiogram requests (*Figure 1*). While the number of echocardiogram requests continues to rise, the number of loops per study has remained relatively stagnant over the years, averaging 114 loops in 2017 and 110 loops in 2024, at our institution. This increasing demand and expectation of faster turnaround times puts a strain on the cardiac ultrasound lab's resources, namely sonographers' and readers' time. In certain circumstances, studies are unnecessarily comprehensive, including images that do not impact

clinical decision-making. This current environment requires optimization of our processes and procedures, and structured triaging. We believe that limited echocardiogram protocols may play an important role in reducing this strain on our system, ensuring high-quality, clinically relevant imaging, and preserving valuable laboratory resources.

Limited echocardiograms are question-focused studies which typically focus on one structural or clinical concern. Limited echocardiograms are differentiated from Focused Cardiac Ultrasounds, in that limited echocardiograms are performed by sonographers and read by echocardiographers; these studies involve full-functionality equipment and the ability to perform advanced measurements.² These question-limited echocardiograms may be appropriate in several scenarios, especially in this setting of limited resources. In the *American Society of Echocardiography*



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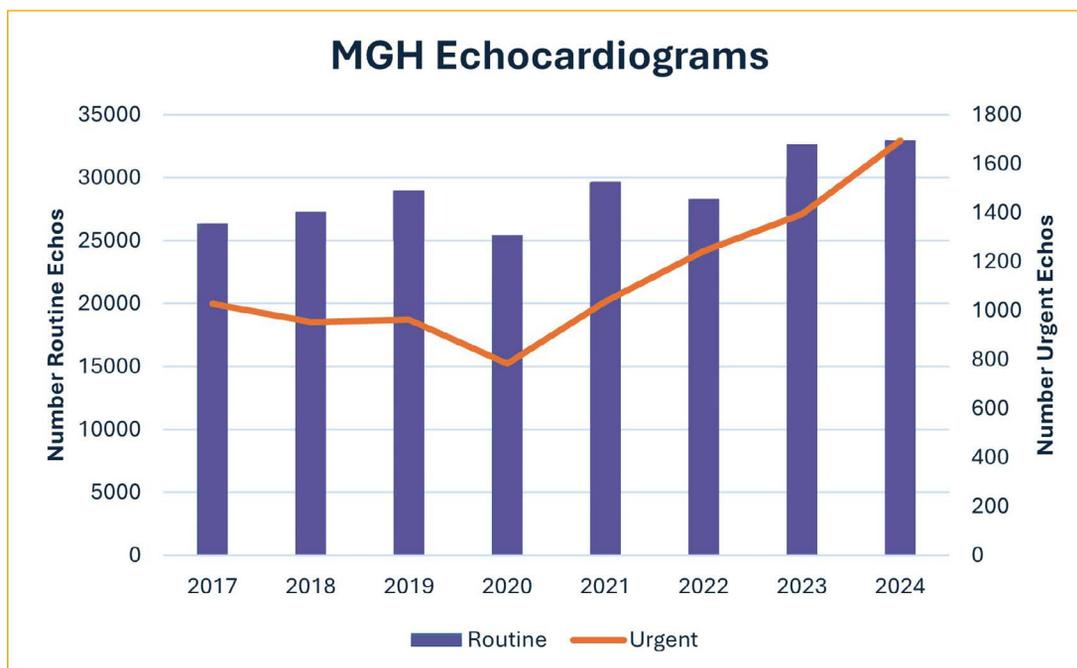


FIGURE 1 Transthoracic echocardiogram orders at Massachusetts General Hospital (MGH) from 2017 to 2024. The blue bars represent routine orders, and the orange line represents the numbers of urgent or STAT echocardiograms ordered.

Guidelines for Performing a Comprehensive Transthoracic Echocardiographic Examination, limited exams are deemed appropriate if the patient has undergone a complete exam with no suspected change outside of the area of interest, with examples including pericardial effusion, left ventricular function, and pulmonary hypertension evaluations.³ We have been applying these principles at our institution with great success, and have found that limited echocardiograms have made our practice more efficient; we suspect that shortened scanning times may also play a role in reducing work-related injuries for sonographers.

One of our most recent and impactful examples of a limited echocardiogram protocol addresses perioperative echocardiograms for patients with acute hip frac-

tures (*Figure 2*). Hip fractures are associated with a high perioperative morbidity and mortality, with mortality increasing dramatically as time passes without surgery.^{4,5} Further, perioperative echocardiograms have consistently been shown to delay care and to only change management in the highest risk patients.⁴⁻⁶ There was a push by our orthopedic colleagues to get these perioperative echocardiograms performed and read more quickly. In speaking with our anesthesia colleagues, there were a few critical lesions that would impact the decision to proceed with surgery or change the intraoperative monitoring approach. These conditions included significant ventricular dysfunction, significant aortic or mitral stenosis, and tamponade. In response, we created an 11-loop protocol

to expedite the performance and review of these studies (*Figure 2*), which has been quite successful.

We have also instituted several other limited echocardiogram protocols in both the inpatient and outpatient settings. For example, we have limited protocols for cardio-oncology surveillance, annual ascending aortic aneurysm monitoring, pericardial effusion monitoring, and hypertrophic cardiomyopathy therapeutic monitoring. These limited protocols fit in 30-minute appointment slots rather than the standard 60-minute slots, and require far fewer loops. As a result, these studies can be performed and read more quickly, and patients and their providers receive results back sooner to assist with decision making. This approach also significantly reduces the physical strain

on sonographers, helping to mitigate the risk of work-related musculoskeletal injuries.

It is inevitable that echocardiography labs will need to more creatively and strategically meet the needs of our patients and colleagues. Limited echocardiogram protocols offer one avenue to allow more efficient and effective care progression. Using our sonographers' and readers' time more efficiently is going to be imperative to keeping up with the demand for both outpatient and inpatient echocardiograms, and we believe that limited protocols are critical to addressing this challenge.

REFERENCES

1. Papolos A, Narula J, Bavishi C, Chaudhry FA, Sengupta PP. U.S. Hospital Use of Echocardiography. *Journal of the American College of Cardiology*. 2016;67(5):502-511. doi:10.1016/j.jacc.2015.10.090
2. Spencer KT, Kimura BJ, Korcarz CE, Pellikka PA, Rahko PS, Siegel RJ. Focused Cardiac Ultrasound: Recommendations from the American Society of Echocardiography. *Journal of the American Society of Echocardiography*. 2013;26(6):567-581. doi:10.1016/j.echo.2013.04.001
3. Mitchell C, Rahko PS, Blauwet LA, et al. Guidelines for Performing a Comprehensive Transthoracic Echocardiographic Examination in Adults: Recommendations from the American Society of Echocardiography. *Journal of the American Society of Echocardiography*. 2019;32(1):1-64. doi:10.1016/j.echo.2018.06.004
4. Hoehmann CL, Thompson J, Long M, et al. Unnecessary Preoperative Cardiology Evaluation and Transthoracic Echocardiogram Delays Time to Surgery for Geriatric Hip Fractures. *Journal of Orthopaedic Trauma*. 2021;35(4):205-210. doi:10.1097/BOT.0000000000001941
5. Chang JS, Ravi B, Jenkinson RJ, Paterson JM, Huang A, Pincus D. Impact of preoperative echocardiography on surgical delays and outcomes among adults with hip fracture. *The Bone & Joint Journal*. 2021;103-B(2):271-278. doi:10.1302/0301-620X.103B2.BJJ-2020-1011.R1
6. Rostagno C, Tozzetti C. Preoperative echocardiography in patients with hip fracture: a prospective cohort study. *Annals of Medicine & Surgery*. 2023;85(10):4709-4714. doi:10.1097/MS9.0000000000001151



Echo/Ortho Quality Project TTE protocol

IMAGE ACQUISITION

Total Imaging Acquisition: 11 (loops + still frames)

Parasternal Long Axis View

- 2D
- Color Doppler (Aortic Valve / Mitral Valve)

Parasternal Short Axis - Aortic Valve Level

- 2D

Parasternal Short Axis - Left Ventricle Levels

- Basal
- Mid
- Apical

Apical 4-Chamber View (A4C)

- 2D
- Color Doppler (Mitral Valve)

Apical 5-Chamber View (A5C)

- Pulse Wave (PW) and Continuous Wave (CW) Doppler of Aortic Valve
- *If A5C Doppler is suboptimal, use Apical Three-Chamber View (A3C)*
- Subcostal View
- 2D

TTE REPORTING

Left Ventricle (LV):

- Systolic Function:
 - Normal or Reduced
 - Ejection Fraction (LVEF): Estimated by single-dimension method

Right Ventricle (RV):

- Systolic Function:
 - Normal or Reduced

Aortic Valve (AV):

- Stenosis:
 - None or Yes
 - If Yes: report Peak and Mean Gradients
- Regurgitation:
 - Report only if Moderate or greater

Mitral Valve (MV):

- Stenosis:
 - None or Yes
 - If Yes: report Peak and Mean Gradients
- Regurgitation:
 - Report only if Moderate or greater

Pericardium:

- Effusion:
 - Yes or No
 - If Yes: include Size and Location

FIGURE 2 Limited echocardiography protocol for perioperative evaluation of hip fracture patients.



THE LEADERSHIP SKILLS I WISH I LEARNED EARLIER:

Lessons from the ASE
Leadership Academy



Contributed by
Akhil Narang, MD, FASE
(Leadership Academy, Cohort 1)



LEADERSHIP often arrives unexpectedly. One day, you're focused on patient care, research deadlines, and finishing echos; the next, you're asked to lead a team, run a program, or make decisions that shape the culture of your lab.

Like many of us in echocardiography, my training prepared me to interpret complex pathophysiology, but not to navigate conflict, inspire teams, facilitate psychological safety, or articulate a vision for a group of talented individuals with different backgrounds and needs. Those skills came much later - slowly, occasionally awkwardly, often through trial and error - and were eventually strengthened and expanded through my experience in the ASE Leadership Academy.

Looking back, there are several leadership lessons I wish I had learned earlier. They would have changed how I approached my work, how I mentored others, and how I built teams. I share them here with the hope that they might shorten someone else's learning curve, or offer reassurance to those who, like me, never saw themselves as leaders until they were suddenly expected to be one.

1. The Most Important Conversations Are the Ones You Don't Want to Have

Early in my career, I convinced myself that difficult conversations could be softened- delayed, diluted, or delegated. But avoidance only erodes trust.

In the Leadership Academy, we practiced structured feedback conversations using real scenarios from our labs. I learned that courage

isn't the absence of discomfort; it's choosing transparency over ease. A two-minute honest conversation can prevent two years of resentment.

Lesson:

Lean into uncomfortable conversations. Direct, kind communication is one of the most powerful leadership tools you will ever use.



One of the most transformative parts of the Leadership Academy was hearing established ASE leaders openly describe their failures, fears, and missteps. Their vulnerability made their leadership feel more accessible.

2. You Cannot Lead if You Cannot Listen

As echocardiographers and sonographers, we are trained to diagnose. Sometimes this spills into diagnosing people - their motivations, emotions, or actions - before they've even finished a sentence. Through exercises in active listening, I learned something humbling: most people don't need solutions; they need to feel heard. Listening builds connection. Connection builds trust. Trust builds teams.

Lesson:

Great leaders don't speak first. They listen first.

3. Influence Is More Powerful Than Authority

When I first became a Director, I assumed title = influence. It doesn't. Influence comes from consistency, empathy, humility, and clarity.

A version of this saying has existed for years: "People don't follow titles - they follow behaviors."

I began paying attention to my behavior during stressful moments, hectic reading room days, and high-stakes structural heart procedures. Leadership happens in those small moments, long before the big ones.

Lesson:

Leadership has almost nothing to do with position and nearly everything to do with presence.

4. Your Team Can Only Be as Balanced as You Are

Like many of us, I used to wear exhaustion as a badge of honor. If I wasn't overcommitted, I worried I wasn't doing enough.

Recently, I've challenged that thinking. Ask yourself if your personal mission statements are aligned with your daily lives. Mine always didn't.

Leadership Lessons from the ASE Leadership Academy



FIGURE: Thematic Lessons Learned from ASE Leadership Academy (Graphic created with Napkin).

I began protecting time for reflection, strategic thinking, mental white space, family, and vacation. This didn't make me less productive - it made me far more effective.

Lesson:

Sustainable leadership requires protecting your own energy as fiercely as you protect your team.

5. Mentorship Is Not a Luxury - It's a Leadership Responsibility

I used to think mentorship was primarily academic: reviewing presentations, helping with research, directing career paths.

But real mentorship is emotional, relational, and deeply human.

Through the Academy, I saw how powerful cross-generational and cross-disciplinary mentorship can be. My cohort - sonographers, physicians, early-career imagers, and seasoned leaders—became a network of advisors and friends. We learned not just from faculty, but from each other.

And equally important: I learned that as leaders, we must actively sponsor the next generation - opening doors, sharing opportunities, and advocating for voices that are often overlooked.

Lesson:

Leadership is not about being in front. It's about bringing others forward.

6. Vision Matters - But So Does Vulnerability

One of the most transformative parts of the Leadership Academy was hearing established ASE leaders openly describe their failures, fears, and missteps. Their vulnerability made their leadership feel more accessible.

Until then, I believed leaders had to project certainty at all times. But vulnerability creates connection, and connection creates influence.

I began sharing not just decisions, but the thinking behind them. Not just successes, but lessons from mistakes. Our team became more aligned—and more human.

Lesson:

Leaders who show vulnerability build teams that feel safe to innovate, question, and grow.

7. Invest in People, and Everything Else Follows

The Academy prompted me to reflect on my own mentors and the subtle ways they shaped my growth - encouraging ideas, challenging assumptions, celebrating small wins. None of that required a budget, a title, or a mandate.

Lesson:

The best leaders grow people, not programs.

Looking Forward

Leadership is a journey, not a title. It is built from conversations, relationships, perspectives, and habits—not from committees or credentials alone.

The ASE Leadership Academy was a catalyst for me, but the real work began afterward, in the echo lab, in the reading room, in clinical hallways, and in the small, unglamorous moments that define our days.

If there's one message I hope readers take away, it's this:

You don't have to wait to be a leader. And you don't have to lead alone. The skills are learnable. The community is here. And somewhere, someone is waiting for you to be the leader they need.

Finally, I want to recognize three exceptional leaders who have served as guiding North Stars throughout my career: Dr. Roberto Lang, Dr. Vera Rigolin, and Dr. James Thomas.



You don't have to wait to be a leader. And you don't have to lead alone. The skills are learnable. The community is here. And somewhere, someone is waiting for you to be the leader they need.

A Leadership Toolkit: 10 Practical Tips for the Echo Lab

1. Ask yourself frequently: "What does success look like for me today?"
2. Replace reacting with reflecting: Take a 10-second pause before responding during conflict or stress.
3. Use gratitude as leadership currency: Public recognition costs nothing but means everything.
4. Delegate outcomes, not tasks: Empower your team to solve problems creatively.
5. Create micro-mentorship moments: Five minutes of attention can change someone's career.
6. Communicate decisions with the "why," not just the "what."
7. Schedule thinking time like any other meeting.
8. Ask your mentees what they need, not what you assume they need.
9. Share your failures - they're often your most generous gifts.
10. Model the behavior you want repeated.



ASE ANNOUNCEMENTS

- Leadership Academy Cohort 4 graduates at Scientific Sessions in June 2026. [Register now to join and celebrate!](#)
- To participate in ASE's professional development programs, [join ASE](#) or [renew your membership](#) today!

A VETERINARY MENTORSHIP IN VIEW:

ASE Mentor Match Spotlight



Contributed by **Étienne Côté, DVM, FASE** and
Jessica Miller, MS, RDMS

What drew me to [ASE Mentor Match](#) was curiosity: I wanted to see how a structured program of mentorship through ASE might work. What held me back considerably was guilt: a feeling of always wanting to provide more in-person mentorship with my own fellows and students in my home institution, and so I certainly shouldn't take on more. However, the feasibility element together with the curiosity element tipped the balance. One hour a month

for six months, with no strings attached – how hard could it be? So, I put my name in the pool of mentors thinking that, my limited scope of practice as a veterinary cardiologist made it unlikely that I would be approached by a mentee.

The Match

I logged on to the Mentor Match platform to see what was available, and I was impressed. The expectations were very clearly defined, and resources for achieving them

were accessible and helpful. It became very clear that this was a good idea because what I stood to learn was mentorship training that was not so easily accessible and applicable in my own institution.

I was truly surprised to receive a message from a prospective mentee within a day or two of signing up. Jessica Miller, RDMS, was finishing her master's degree with a capstone project on formal recognition of sonographers in veterinary medicine. Jessica had a

master's program director; would I be interested in being a mentor from the clinical veterinary world?

It was easy to say yes, because it seemed like the ideal prospect for mentorship. I could offer my point of view, and understand Jessica's, so she could take an additional step forward with a veterinary clinical perspective as part of that.

The Meetings

Our first meeting was exactly how a fruitful mentorship begins: we really hit it off. Jessica had clearly identified a need in veterinary diagnostic imaging and done a great deal of work to define the problem, design a possible solution, and identify hurdles needing to be cleared (and ways of doing so). I felt that what I could contribute was useful to her, even though it would only be a few hours' worth. Jessica very quickly showed characteristics that are memorable to me in the most successful fellows I have trained. So, for the purposes of the Mentor Match program, I recognize that this can't be guaranteed in every mentor-mentee match; however, I also recognize that this particular match-up would not have happened without Mentor Match. In that sense, the program certainly fulfilled its mandate.

Ultimately, we had five one-hour Zoom sessions that covered a range of topics, from the logistics of echocardiography in veterinary referral institutions to future opportunities.

Conclusion

I feel extremely fortunate to have benefited from both Jessica as a great mentee and the Mentor

I feel extremely fortunate to have benefited from both Jessica as a great mentee and the Mentor Match platform. The payoff for participating was disproportionately good.

Match platform. The payoff for participating was disproportionately good. In exchange for six hours of mentorship, I achieved much more than I expected. Sure, I discovered firsthand how the Mentor Match program works and what it can offer to me and

my colleagues who want to mentor. Well beyond this, though, was to see it in action. My discussions with my mentee were mutually beneficial, which is not what I was expecting. The methods of mentorship, and greater knowledge in my mentee's topics of interest, are long-lasting benefits. I also got to contribute a little bit to my mentee's thoughts and ideas, in a way that seems like it could make a difference. Finally, I concluded the mentorship knowing that this connection exists with great promise for future growth. I have a hard time thinking of how this could have gone better or been leveraged to greater benefit. I hope to be able to return to the Mentor Match platform one day to take advantage of the terrific resources it holds, because I only scratched the surface. The lasting feeling is one of time well spent and of an intended teaching role that also became a learning role for me.

The Mentor

Étienne Côté, DVM, FASE



I am a registered diagnostic medical sonographer who now scans in veterinary medicine. In August 2025, I completed my MS in radiologic and imaging sciences with a concentration in education at California State University, Dominguez Hills. I first heard about the ASE Veterinary Specialty Interest Group (Vet SIG) while reaching out to an author of a reference article for my capstone project on the feasibility of veterinary sonographer professionalization. I was encouraged to join the ASE Vet SIG group, which I promptly did! When I received the email about the Mentor Match program shortly thereafter, it struck me as a fantastic opportunity to broaden the understanding of my project by drawing on the knowledge and perception of impactful parties on the veterinary side, and that is when I was lucky enough to match with Dr. Étienne Côté.

Initial Meeting and Goals

First, we discussed our backgrounds and my capstone research on the feasibility of professionalizing veterinary sonographers. We discussed a mutual lack of clarity regarding a universally defined standard for competencies and education in veterinary ultrasound. We laid out a timeline for the program that would work best for each of us, and Dr. Côté offered to read the final draft of my paper and provide essential feedback. We ended with my goal of helping build on this. Once one has this initial research, how do they continue? A question we explored throughout the rest of our mentorship program.

The Mentee

Jessica Miller, MS, RDMS



The Path We Traveled

Because our mentorship began right at the tail end of my collegiate program, the initial weeks were deeply focused on that. The Mentor Match platform, with its user-friendly nature, built-in chat feature, and reminders, helped keep us on track and in one place. After I graduated, the conversations shifted to career advice and next steps. Dr. Côté shared his journey, insights, and wisdom. About midway through our mentorship, we both attended professional conferences: I attended the ARDMS conference, and Dr. Côté attended ASE's Scientific Sessions. Upon return, we discussed the evolution of learning styles at both these conferences from strictly lectures to a more engaging and integrated approach, an exciting advancement. Dr. Côté shared with me the discussion at the ASE conference about the possibility of sonographers on the veterinary side was of great interest!

Looking to the Future

There were many common threads, mutual connections, and exciting prospects that evolved from the program. Because this was both our first time participating, we came into it with an open mind. Our mentorship was driven by a desire to grow the Vet SIG and human and veterinary echocardiography together, at the forefront.

Key Takeaways

- A combination of passion and open-mindedness can lead to great things.
- It is a small professional world, but with endless opportunities for great connections if you so wish to find them.
- Putting yourself into new rooms will open doors.
- "The sweetest part is acting after making a decision."

Thank you, ASE and Dr. Côté, for this excellent opportunity and experience!

ASE2026

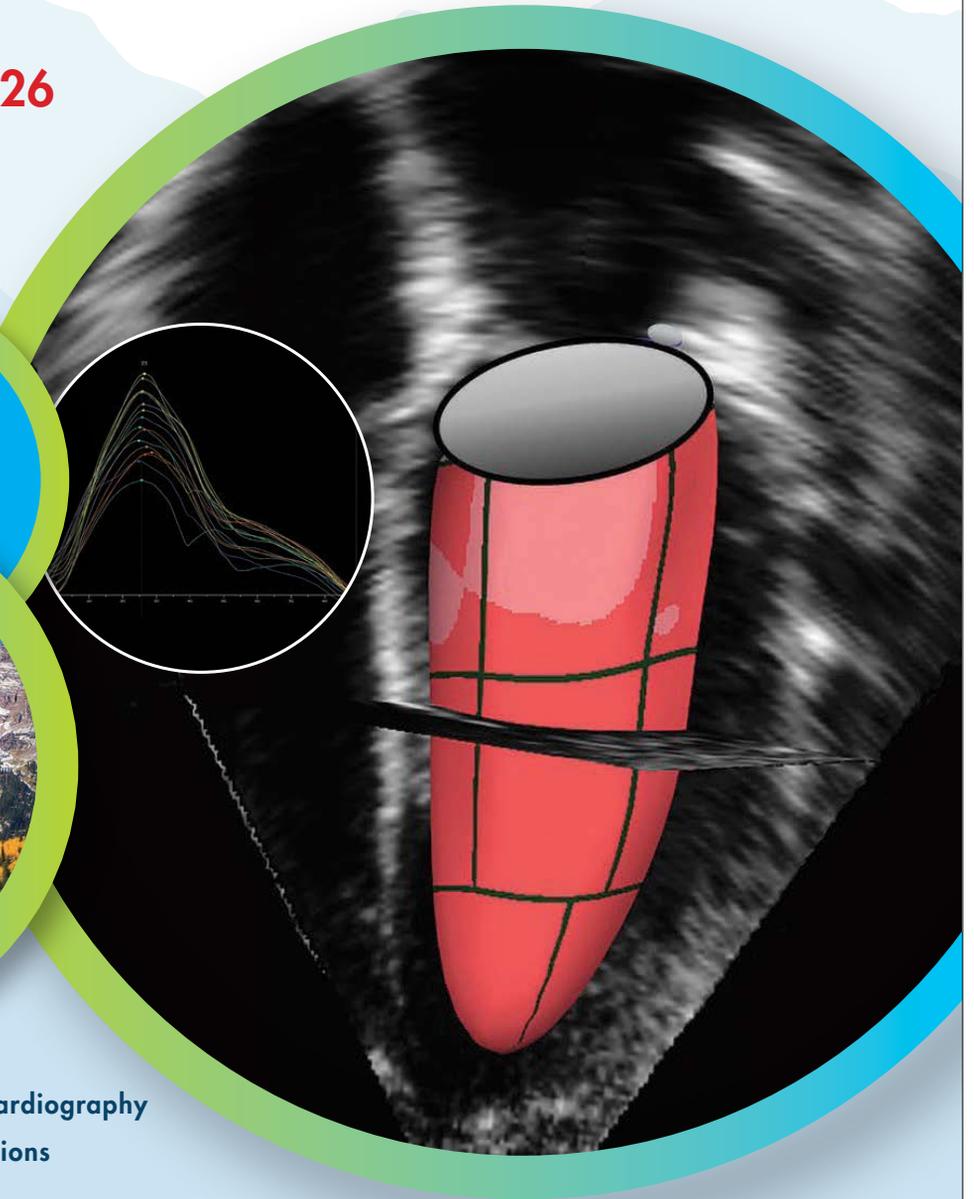
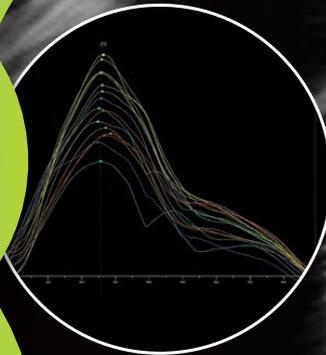
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