

# ECHO



**4** *Foundation for the Future of Cardiovascular Ultrasound*

*Sonographer Career Pathways to FASE: How Can FASE Help Achieve Career Goals and Open Opportunities?*

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*Challenges of Patient Management in a Hybrid Operating Room*

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*Highlights from ASE's Multimodality Imaging for Cardiac Surveillance of Cancer Treatment in Children Guideline*

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# 2024 EDUCATION CALENDAR

## CONTENT AVAILABLE NOW

### [Advanced Echo: Echo Access Online Course](#)

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

Jointly provided by ASE and the ASE Foundation

### [Registered Physician in Vascular Interpretation \(RPVI\) Online Review Course](#)

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

## JANUARY 2024

### [33rd Annual Echo Hawaii](#)

*January 15-19, 2024*

*Fairmont Orchid, Kohala Coast  
Big Island, HI.*

Jointly provided by ASE and the ASE Foundation

## FEBRUARY 2024

### [36th Annual State-of-the-Art Echocardiography](#)

*February 16-19, 2024*

*Westin Kierland Resort & Spa  
Scottsdale, AZ.*

Jointly provided by ASE and the ASE Foundation

## MARCH 2024

### [Interventions, and Diastology/Imaging Summit](#)

*March 7-10, 2024*

*Fontainebleau Miami Beach  
Miami, FL*

Provided by Cleveland Clinic Educational Foundation and in cooperation with ASE

## MAY 2024

### [25th Annual ASCeXAM/ReASCE Review Course Virtual](#)

*Content Available May 6, 2024.*

Jointly provided by ASE and the ASE Foundation

## JUNE 2024

### [35th Annual Scientific Sessions](#)

*June 14-16, 2024*

*Oregon Convention Center  
Portland, OR*

Jointly provided by ASE and the ASE Foundation

Discounted rates for ASE members. To learn more and register, visit us at [ASEcho.org/Education](https://ASEcho.org/Education).

This text also appears in the December JASE. [OnlineJASE.com](https://OnlineJASE.com)

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Cover art: "Cookie Monster" Melynda Ancell, RDCS (AE, PE) and Robert Quaife, MD University of Colorado Hospital, Aurora, Colorado

## EDITORS' NOTE

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

# THE ASE FOUNDATION (ASEF): FOUNDATION FOR THE FUTURE OF CARDIOVASCULAR ULTRASOUND

Contributed by **Benjamin W. Eidem, MD, FASE**, Director of Pediatric and Congenital Echocardiography, Mayo Clinic and Professor of Pediatrics and Medicine at Mayo Clinic College of Medicine, Departments of Pediatrics and Cardiology, Rochester, MN, and **James N. Kirkpatrick, MD, FASE**, Section Chief of Cardiac Imaging and Director of Echocardiography and Professor of Medicine and Bioethics and Humanities, University of Washington in Seattle



James N. Kirkpatrick,  
MD, FASE

A

s I continue my quest to highlight our ASE core values, there could not be a more shining example than the ASEF. The ASEF truly embodies all our ASE core values: Diversity, Excellence, Professionalism, Ethical Behavior, Advancing Knowledge, and Caring Community. I have invited Dr. James Kirkpatrick, MD, FASE, our ASEF Board Chair and our ASE.23 Scientific

Sessions Chair, to update our membership on the mission and incredible successes of the ASEF in 2023 as well as to provide a strategic vision as we move into 2024:

The ASE 2023 Scientific Sessions theme was “Foundations and the Future of Cardiovascular Ultrasound,” a theme we will borrow for this update on the ASE Foundation, the well-established charitable arm of the ASE that funds the future of cardiovascular ultrasound through education, research, global outreach, guideline dissemination, and patient engagement. The ASEF is governed by an independent board and is fueled by the fundraising of the Annual Appeal Committee. The ASEF strategic plan aims are (1) to fund innovative research that improves the quality and efficiency of healthcare delivery through the application of cardiovascular ultrasound, (2) to provide healthcare workers worldwide with better access to tools and strategies for improvement of

cardiovascular health through the use of ultrasound, and (3) to ensure that the ASEF is recognized as a key force in improving cardiovascular health and access to ultrasound worldwide.

“

The ASEF truly embodies all our ASE core values: Diversity, Excellence, Professionalism, Ethical Behavior, Advancing Knowledge, and Caring Community.

## THE ASEF AT ASE2023

The ASEF sponsored 34 grants and scholarships that enabled our next generation of sonographers and physicians to attend ASE2023. Many attendees at the sold-out 14th Annual “All the Colors of the World” Gala wore formal attire showcasing their personal heritage and culture. At the Gala, the ASEF announced the Gregory Tatum Global Health Travel Grant to honor a pediatric echocardiographer from Duke who was a tireless leader in global outreach who tragically died in November 2022 after a courageous fight against cancer. The Tatum Travel Grant joins the David Adams Global Service Award in providing \$1,500 to participants in ASEF global outreach events, empowering them to follow in the footsteps of two of ASE’s foremost humanitarians. The ASEF also crowned new champions in the Cardiovascular Challenge step competition, sold “Images from the Heart” (photos from global outreach events), and awarded 31 research prizes for the top abstracts (*Table 1*).

## ASEF FUNDS THE FUTURE

The ASEF does not just applaud research accomplishments with awards, it also spurs innovation through research grants. In the face of declining funding for early career investigators, the new ASEF EDGES

(Early-career Development Grant for Echo Scientists) program will annually provide three grants of \$25,000 to fund projects that address clinical gaps in cardiovascular ultrasound imaging. The 2023 Impact of Echo Report Recommendations for Severe Valvular Heart Disease Research Grant provided two years of funding to examine the impact of embedded echocardiography report interventions on referral patterns and outcomes in patients newly diagnosed with severe aortic valve stenosis (AS). The Pamela S. Douglas, MD, FASE Research Scholar Award biannually supports clinical or translational research scholars with a \$75,000 scholarship.

An exciting new ASE-ASEF collaboration, the Initiative for Collaborative Clinical Science (ICCS), will curate ideas for research based on key clinical gaps in order to motivate potential partners (industry, funding agencies, etc.) to support imaging research.

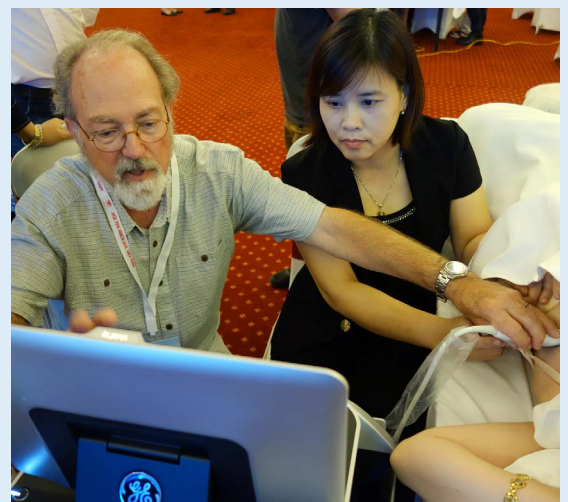
## IN-PERSON GLOBAL OUTREACH RETURNS

September 2023 marked the return of global outreach events with a journey to Sapa, a region of northwest Vietnam, in collaboration with the Vietnam National Heart Institute. The event was dedicated to the memory of Dr. Greg Tatum. The team scanned 852 patients over two days, participated in the training of

**TABLE 1**

Grant/Scholarship	N
Alan D. Waggoner Student Scholarship Awards	14
Katanick Student Scholarship Award	1
Top Investigator Travel Grants	24
Council Travel Grants	3 per council = 18
Brian Haluska Sonographer Research Award Competition	
Alan S. Pearlman Research Award	1
Michael H. Picard Research Award	1
Feigenbaum Cardiovascular Sonographer Student Travel Grant	1
TOMTEC Innovator Research Travel Grant	1
<b>TOTAL</b>	<b>65</b>

Photos from ASEF Outreach Events in  
Kenya (2016 and 2019) and Vietnam (2015, 2019, and 2023).





local nurses and physicians from the nearest cardiology program in Lao Cai (there are currently no sonographers in Vietnam), assisted in a research project, and delivered lectures for 150 regional clinicians at a two-day educational symposium at Bach Mai Hospital in Hanoi.

The Gregory Tatum Global Health Travel Grant and the David Adams Global Service Award were conferred on Vietnam. 23 team members Jenni Hake, RDCS, RDMS, RVT, FASE and Danielle Gravlin, RDCS, respectively.

### **FOUNDATION OF THE FOUNDATION: FUTURE FUNDING**

The ASEF 2022 annual appeal raised over \$266,000 from more than 2,500 individual donors reflecting the tireless efforts of the Annual Appeal committee. This year, the ASEF board set a goal of \$200,000, in light of current economic conditions. The ASEF plan to reach this goal includes a number of novel fundraising endeavors:

- The Interventional Echocardiography (IE) Council Steering Committee won the “March Games” competition between ASE communities after raising nearly \$1,400.
- Coffee Day (donate the cost of a cup of coffee) sought to raise \$5,000.
- Giving Tuesday (November 26 – December 2) aimed to generate \$35,000 in donations.
- New donation category: Cardiovascular Sonographer Leadership Development. This initiative, created to encourage sonographer engagement, will provide travel stipends for sonographer members volunteering in leadership positions within ASE and ASEF to attend the ASE Scientific Sessions.

With a firm foundation of funding, the ASEF can continue to offer travel and research award scholarships, support the next generation of cardiovascular imaging researchers, and expand global outreaches. Future events are in the works, with proposals in development for outreaches to Mexico in conjunction with the upcoming 5th World Summit on Echocardiography, Nepal, India, and Kenya. Looking down the road, we hope to engage the ASE International Alliance Partners to merge research and global outreach, expanding the efficient and effective delivery of cardiovascular ultrasound. In addition, the ASEF will build on past successes in patient education and engagement and dissemination of ASE guidelines both domestically and abroad. In this season of giving, please join us in making sure that the ASEF remains the foundation for the future of cardiovascular ultrasound.

*This text also appears in the November JASE.*

[OnlineJASE.com](https://www.onlinejase.com)

Benjamin W. Eidem,  
MD, FASE  
ASE President



## **Sonographer**

# **VOLUNTEER OF THE MONTH-DECEMBER**

## **Congratulations**

### **Jeff Hill, MSc, ACS, FASE**

*Professor, Massachusetts College of Pharmacy and Health Sciences*



role model and mentor and who taught me how to perform clinical research and helped me elevate my career as a cardiac sonographer. Since 2010, I have been an educator in cardiac ultrasound.

### **When and how did you get involved with cardiovascular ultrasound?**

My interest in sonography began in 1995 when I was working as a lab assistant, I observed the vascular sonographer traveler "schlepping" into the clinic with a mammoth ultrasound system. I asked him if I could observe a study and was sold when I saw the image of the color flow through the vessels and he explained the ability to see human anatomy and physiology with ultrasound. At that time, there were no formal ultrasound programs in the greater Worcester, MA, area, so training was limited. My mother, a retired surgical technologist, inspired me to apply to a new 18-month program in cardiovascular ultrasound. I entered the program and learned from Brenda Kusay, RDCS, an outstanding sonographer and educator.

I performed my clinical training at the Brigham and Women's Hospital in Boston, MA, under the direction of Bruce "Talbot" Jozitas, RDCS, the Chief Sonographer. Given his passion for echocardiography, Talbot shared his knowledge and exceptional technical skills with me. The hard work paid off after graduation as I began my career at Massachusetts General Hospital in Boston, MA. Under the direction of Chief Sonographer Jane Marshall, RDCS, I had the opportunity to learn echocardiography in a way that was all about attention to detail and the high-quality imaging standards required in their laboratory. From there, I worked for over a decade at the University of Massachusetts Medical Center in Worcester, MA, under the direction of Dr. Gerard Aurigemma, who was an incredible

### **What is the name and type of facility/institution you work in, and what is your current position?**

I work in the School of Medical Imaging and Therapeutics at Massachusetts College of Pharmacy and Health Sciences University in Worcester, MA. My primary role is teaching echocardiography. The program is 16 months, and the students graduate with a bachelor's degree in Diagnostic Medical Sonography. In addition, I am actively performing research studies with my student's using robotics for lung ultrasound and computational models to study the effects of the aging aorta on myocardial dynamics.

### **When and how did you get involved with the ASE?**

Jane Marshall inspired me to get involved with the ASE. During my training, I realized the importance of the field and the sonographer's role in society. In 2002, Massachusetts General Hospital hosted the first-of-its-kind ASE-sponsored Sonographer Update meeting in Boston, MA. The theme was to have cardiologists and sonographers team up to present echocardiography's theory and technical aspects. Presenting with Dr. Aurigemma on the technical tips for assessing diastolic function was a fantastic experience. I knew the "sky was the limit" with education and my involvement with ASE!



### Why do you volunteer for ASE?

These are the top three reasons I volunteer for ASE.

1. I volunteer for ASE because I care deeply about the profession. Importantly, it is about the quality of the exam. Sonography is like no other profession, where the images are created not only by the ultrasound system, but also by the sonographer's skills, dexterity, and psychomotor skills. We are not "button pushers" but diagnostic cardiac sonographers, and the results of a high-quality, comprehensive echocardiogram may change the course of therapy or even be life-changing for some of our patients.
2. ASE provides an inclusive venue for sonographers and physicians to collaborate and learn from each other. In addition, my passion is fostering and mentoring new sonographers and teaching sonographers how to conduct research.
3. Incredible friendships made among the Society. Over the past 22 years as an ASE member, I have met and collaborated with hundreds of sonographers and physicians worldwide. Some of my closest friends today are because of the ASE.

### 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?

My current role in the ASE is serving on the Standardization of Adult Echocardiographic Reporting Writing Group. Standardizing the echocardiography report structure and its vocabulary will reduce the variability and create harmonized reporting and verbiage that may facilitate artificial intelligence (AI) empowered diagnostic and prescriptive processes for the future growth of the field. I have been very busy the past twenty years with the ASE. From 2003 through 2023, I have served on 13 committees, including bylaws and ethics, education oversight, sonography programs, cardiac sonography council, local society, registry review, membership steering, awards, research publication and review, research restructuring, the Image Guide Registry, and research committee. As for local echo society education, I believe it is critical as it provides a mini venue for those who cannot attend the national echo meetings. I have been involved with local echocardiography societies and meetings since 2002 and have hosted nearly a dozen conferences and symposiums throughout New England. I have to give a plug to the newly formed [New England Society of](#)

[Echocardiography](#) which is a dynamic group of cardiac sonographers, students, fellows, physicians, nurses, and industry representatives who share a passion for education in echocardiography. We recently hosted a meeting at my university in October, which was a huge success. I encourage all to get involved and support these meetings.

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

My advice for members who want to become more involved in the profession or with ASE is to contact colleagues who have experience and have been or are currently serving on ASE committees. The [ASE website](#) provides information on all committees and their members. In addition, the ASE [Mentor Match](#) program is an excellent way to become more involved in the profession. This program pairs ASE members based on career path, areas of practice, and professional development goals. If chosen, not only do you learn from the experts, but it is also a great way to develop new relationships within the Society. In addition, applying to be on a committee and, if accepted, is excellent for connecting with fellow ASE members and becoming a stakeholder in the Society. Lastly, attend the annual ASE Scientific Sessions, which is arguably the most innovative echocardiography conference. I will be in Portland, OR, for the [2024 Scientific Sessions](#), so please look me up!

### What is your vision for the future of cardiovascular sonography?

Over the past couple of years, ultrasound technology has been significantly advanced, specifically for echocardiography. Most ultrasound vendors have developed or acquired AI technologies to refine the exam workflow and improve the detection of disease. In addition, AI may hopefully ease the burden of musculoskeletal disorders that sonographers can develop from prolonged and difficult scans. However, it is a two-way street, and the sonographer is responsible for staying healthy to avoid potential injury. As I teach my students, stretching is key before, during, and after the exam. In addition, the application of AI may shorten the exam time without sacrificing quality. A shorter scan time may make sonographers healthier and, most importantly, happier!

# A Journey through Interventional Echocardiography

Contributed by **Varun Khanna, MD**, Oklahoma  
Heart Hospital, Oklahoma City, OK



**M**Y DAD ALWAYS told me to keep an open mind when it came to choosing my specialty. This showed the foresight of an astute physician and caring father, because it gave me the room to pursue the new and exciting world of interventional echocardiography. Fast forward nearly 20 years and I find myself entering my eighth year as an interventional echocardiographer and general cardiologist at a large cardiology practice in the middle of country.

As a CCU resident at Beth Israel Deaconess, I took care of patients enrolled in the CoreValve trials in the post-procedural setting and witnessed near-immediate improvement in their symptoms. By the second month of my general fellowship at Boston Medical Center, I knew I wanted to be an echocardiographer and spent the next three years cultivating that interest and building a strong foundation of knowledge. I was fortunate to be accepted as an advanced echocardiography fellow at Columbia, one of the largest structural heart programs in the country. During that year, I was exposed to an incredible volume and variety of cases and pathology. We were involved in transcatheter-based interventions using the few FDA-approved devices at that time but also with multiple other devices that were under investigation. Working with Dr. Hahn and the valve team there was the opportunity of a lifetime, one that solidified my decision to become an interventional echocardiographer while also providing me with a fund of knowledge that has shallowed my learning curve for the newer devices I have encountered since finishing fellowship. While I spent that year honing my TEE skills with my attendings and co-fellows, my training was just the beginning, especially in a relatively new and rapidly moving field. The foundational skillset I acquired during fellowship was crucial to my future plans.

*The foundational skillset I acquired during fellowship was crucial to my future plans.*

As I approached graduation from fellowship, interventional echocardiography was emerging as a burgeoning clinical need, one no longer confined to large academic centers. So, when the call to return to family tempted me to look for a job in my hometown of Oklahoma City, I was fortunate to find a large, forward-thinking, private practice at the Oklahoma Heart Hospital. This, I knew was an ideal fit for my desired career path and I started to negotiate in earnest a contract, one that was as novel to them as it was to me fresh out of fellowship.

My vision was to have general clinical practice but also a predominant role as an imager involved in diagnosis, evaluation and treatment of valvular heart disease. We quickly agreed on an arrangement that directly reimbursed me for the time I spent with the valve team and being the medical director of the echocardiography lab while also supporting my clinical practice with productivity-based model. This was a great start, one that has allowed our institution to nearly double our transcatheter valve procedure volume since I began and expand from the left heart to the right heart, all while supporting excellent transcatheter outcomes. We did not step out of our comfort zone; we expanded our comfort zone.

To this day, contract negotiation remains a challenge for new interventional echocardiographers as many institutions do not have precedent to lean on. My negotiation was a smooth process as we shared a vision for my role in the hospital. Interventional echocardiographers should be reimbursed for their time, especially given the anticipated increase in volume and complexity of these cases.

With the number of new devices entering the market, we need flexibility in our schedules to attending device trainings and conferences in order to maintain our ability to support these procedures moving forward. We will increasingly find ourselves caught between our responsibilities at our

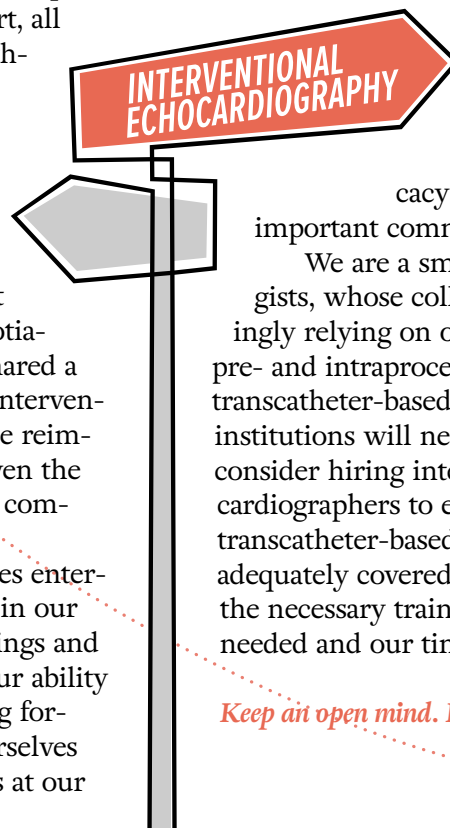
*Interventional echocardiographers should be reimbursed for their time, especially given the anticipated increase in volume and complexity of these cases.*

institutions providing imaging support for scheduled cases and our duty to evolve and learn about new devices and the techniques needed to ensure safe and successful interventions in the future. Over the years, I have attended both in-person and virtual conferences in addition to live device trainings. I especially enjoy webinars put on by my fellow interventional echocardiographers that explore the intricacies of imaging for these complex interventions and the newer devices. I am also excited to see how

the ASE Interventional Echocardiography Council continues to grow as there is a need to have advocacy for our small and important community.

We are a small sect of cardiologists, whose colleagues are increasingly relying on our expertise in the pre- and intraprocedural settings. As transcatheter-based therapies grow, institutions will need to adapt and consider hiring interventional echocardiographers to ensure that these transcatheter-based procedures are adequately covered by individuals with the necessary training. Our expertise is needed and our time is valued.

*Keep an open mind. I'm glad I did.*



# Sonographer Career Pathways to FASE: How Can FASE Help Achieve Career Goals and Open Opportunities?

Contributed by **Rebecca Klug, BA, ACS, RDCS, (AE, PE), RT (R), FASE**; **Daniel Forsha, MD, MCS, FASE**; **Jimmy Lu, MD, FASE**; **Shiraz Maskatia, MD, FASE**; **Rita France, RDCS, RDMS, RT, FASE**



*Research what is needed to become FASE and start early in your career looking for opportunities to participate in research, education, and leadership/volunteerism to prepare for the requirements for FASE.*

**F**ELLOW OF THE AMERICAN Society of Echocardiography (FASE) designation can be the next professional step to achieve for sonographers wanting to enhance their contributions to the field of echocardiography. FASE can be a beneficial way to recognize those sonographers who excel in instructing, researching, and progressing the field of Cardiac Ultrasound. Through this month's article we reached out to the Chair of the FASE, Training and Certification Advisory Committee, Jennifer Warmsbecker, BS, RDCS, FASE, for tips, tools, and insight on the benefits of being a FASE sonographer and how to achieve this goal.

**Q:** What are the deadlines for application and how many applicants does the FASE committee typically review after every application deadline?

**A:** The application deadline is the first day of February, April, June, August, October, and December. The committee reviews approximately 25 applications after each deadline.

**Q:** What is the typical mix of physician vs. sonographer applicants?

**A:** We receive twice as many physician applicants compared to sonographers.

**Q:** What is the acceptance rate?

**A:** Out of 25 applications, on average, 2-3 are not accepted. We give feedback to those applicants on ways to improve the chances for acceptance in the future.

**Q:** What are the possible barriers or challenges that sonographers might encounter to obtain the FASE designation?

**A:** A sonographer may not have the opportunities to participate in research activities or participate in educational opportunities within their institution. They will have to seek out these opportunities through volunteerism and education with societies such as ASE, SDMS, and ARDMS to name a few.

**Q:** What are the benefits of FASE for sonographers?

**A:** Personally, I believe FASE has offered me more opportunities to serve on ASE committees and ultimately become the Chair of the FASE, Training & Certification Advisory Committee. FASE is a title that shows dedication to the field of echocardiography and recognizes dedicated ASE members with a diverse set of skills and comprehensive knowledge of all aspects of echocardiography. Sonographers can feel proud of their accomplishments and be recognized for it. According to a 2010 ASE sonographer survey FASE status potentially could result in a higher pay scale.

**Q:** What are some tips for achieving FASE for sonographers?

**A:** Research what is needed to become FASE and start early in your career looking for opportunities to participate in research, education, and leadership/volunteerism to prepare for the requirements for FASE. Be mindful of when you achieve these goals as they are time sensitive. Seek out

“

***FASE is a title that shows dedication to the field of echocardiography and recognizes dedicated ASE members with a diverse set of skills and comprehensive knowledge of all aspects of echocardiography. Sonographers can feel proud of their accomplishments and be recognized for it.***

”



*The FASE Committee is working hard with ASE to offer opportunities for sonographers and is actively reviewing the application process to see if we can make the process of applying easier while maintaining the integrity of the FASE designation*

other FASE members for mentorship and guidance. Find local cardiovascular ultrasound organizations in your area and volunteer. ASE also has opportunities to volunteer “ASE Micro-Volunteering Opportunities” to offer as many volunteer opportunities as possible for all members interested in serving. For example, writing an article in Echo Magazine counts as a volunteer activity. Learn more about contributing to the Echo Magazine.

**Q: Do you need to volunteer with ASE to achieve FASE (since some ASE opportunities prefer to select those who already have FASE status)?**

**A:** You do not have to volunteer only with ASE to become FASE. Volunteering at a local/regional or international cardiovascular ultrasound society qualifies. Volunteering for outreach or free screenings aimed at the public or underserved populations that are ultrasound related.

**Q: What additional resources could ASE provide to increase the number of sonographers who obtain the FASE designation?**

**A:** The FASE Committee is working hard with ASE to offer opportunities for sonographers and is actively reviewing the application process to see if we can make the process of applying easier while maintaining the integrity of the FASE designation. ASE offers opportunities to serve through micro-volunteer opportunities, and the Mentor Match program. Cross talk has begun with other committees through the Affinity groups to broaden awareness of FASE.

**Q: Is there a limit on the number of applicants that are accepted from one institution in a calendar year?**

**A:** No.

**Q: What are a couple different career paths that could help someone achieve FASE?**

**A:** Participating in research, teaching students, fellows, residents, and sonographers within your place of employment. Actively participate in regional societies in your area or with the Society of Diagnostic Medical Sonography (SDMS), ARDMS, IAC, or CCI.

**Q: Can you explain a little about the FASE review process?**

**A:** Applicants will receive an update regarding their application within two weeks of the application deadline. The FASE application fee will only be requested after application is reviewed and has met all the application requirements.

[Learn More and Apply Today!](#)

## Challenges of Patient Management in a

# Hybrid Operating Room

Contributed by **Abimbola Faloye, MD, FASE, FASA**, Department of Anesthesiology, Emory University, Atlanta, GA; **Amy Yan, MD**, Department of Anesthesiology, Emory University, Atlanta, GA; and **Himani Bhatt, DO, MPA, FASE**, Mount Sinai Hospital, New York, New York

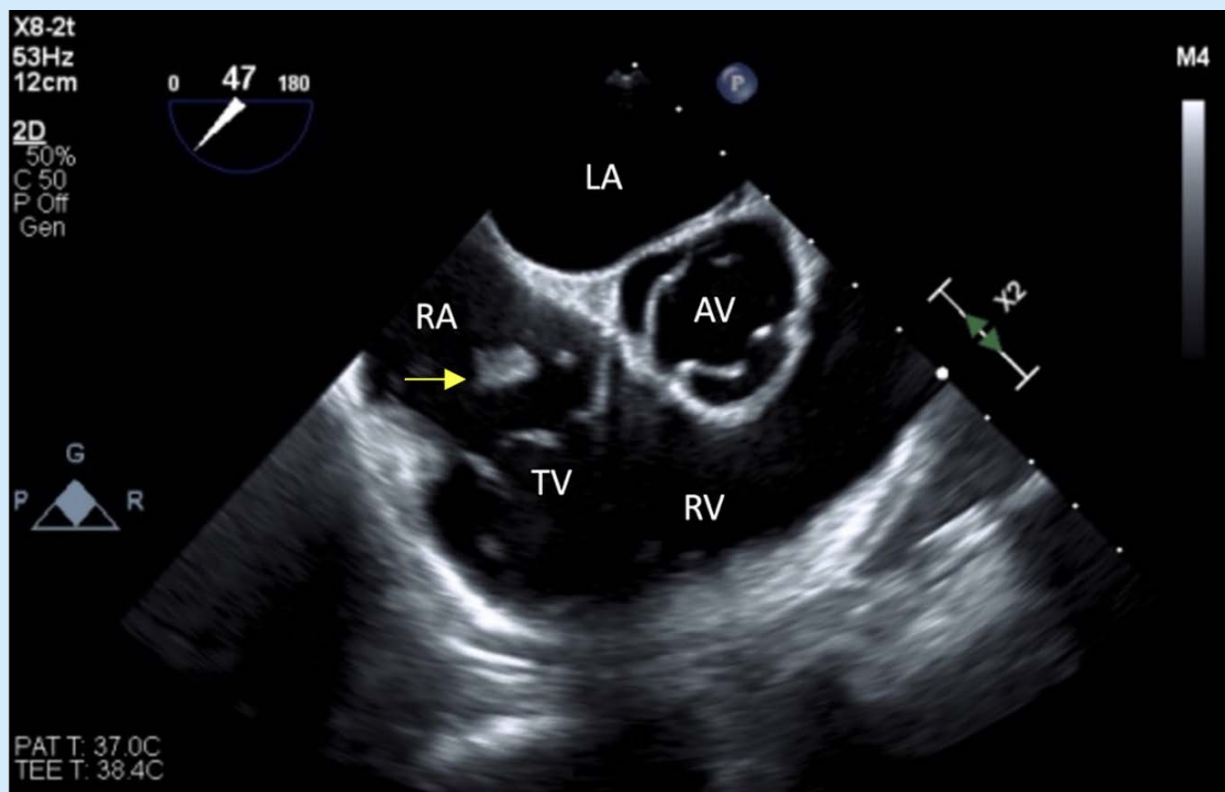


*Specifically, hybrid ORs are sterile environments outfitted with equipment necessary to initiate and support full cardiopulmonary bypass emergently.*

**H**YBRID CARDIAC OPERATING rooms (OR) are an amalgamation of an interventional cardiology suite and an operating room. Specifically, hybrid ORs are sterile environments outfitted with equipment necessary to initiate and support full cardiopulmonary bypass emergently. They are frequently located in the periphery of the operating room suite often in a completely different location and usually within designated cardiology suites. Hence, they are primarily used for interventional cardiology procedures. This distinction is a crucial element that directs anesthetic management, especially in high-risk cases.

### Case Presentation

We present the case of a 62-year-old female with a permanent pacemaker implanted 17 years prior for sick sinus syndrome presented with chest pain and progressive facial and upper extremity swelling and chest pain. Chest X-ray revealed two right atrial leads and one right ventricular lead. Computed tomography (CT) of head and neck revealed an area of focal stenosis in the superior vena cava (SVC) involving her pacemaker leads, consistent with SVC syndrome. Therefore, she was scheduled for pacemaker lead extraction and



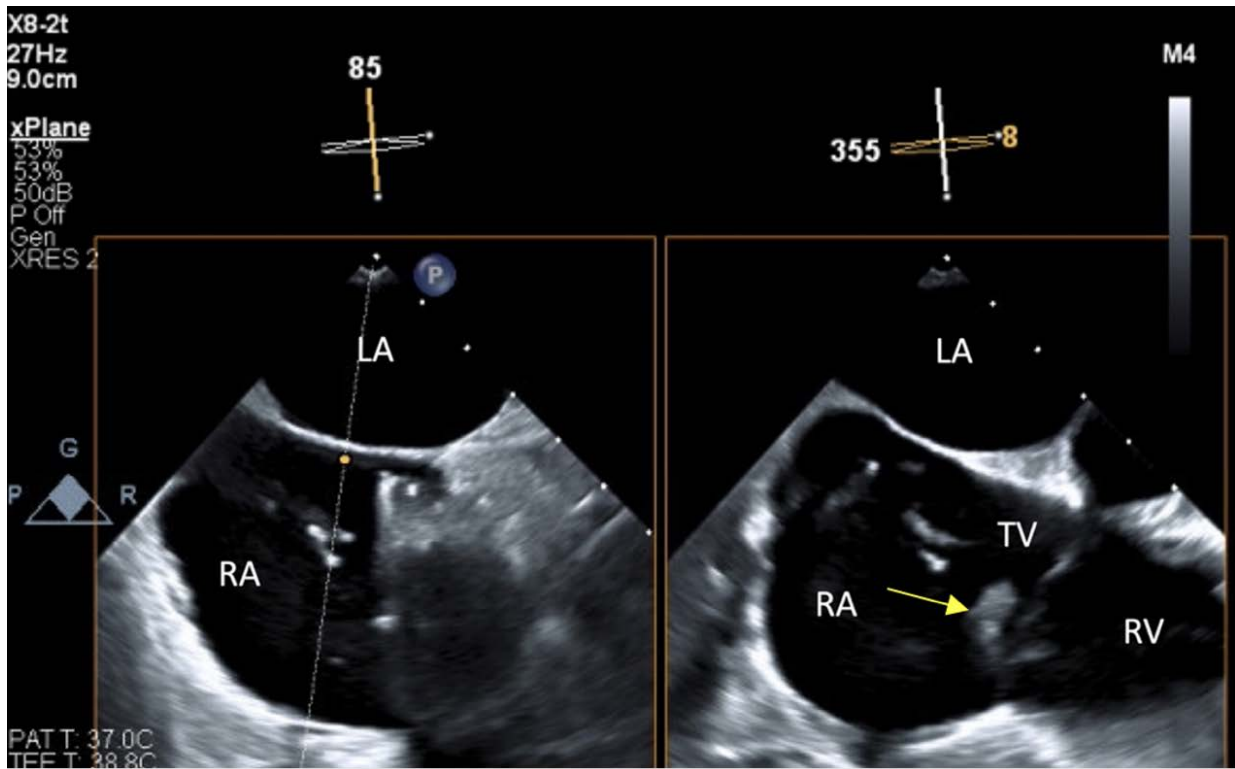
**FIGURE 1:** Midesophageal right ventricular inflow outflow view demonstrating a highly mobile mass on the tricuspid valve. LA = left atrium, RA = right atrium, RV = right ventricle, AV = aortic valve, TV = tricuspid valve.

SVC stent placement in a hybrid operating room, with cardiothoracic surgery backup.

The patient underwent an uncomplicated laser lead extraction and sequential dilation of her SVC stricture. Immediately after an uncovered stent was deployed across the SVC lesion and inflated using a balloon-in-balloon (BIB®) catheter (Braun; Kronberg, Germany) the patient became hypotensive. SVC rupture was strongly suspected. In response, the anesthesiology team initiated massive transfusion protocol while the interventional team rapidly performed a venous angiogram. Extravasation of contrast outside the SVC confirmed the diagnosis of SVC rupture. A Bridge occlusion balloon (BOB) (Philips; Amsterdam, Netherlands) was immediately deployed proximal to the rupture site to control hemorrhage and provide time for transfusion and resuscitation. Once the patient was stabilized, the interventional team deflated the BOB and deployed a covered stent across the SVC perforation to seal the rupture site. Although her blood pressure remained stable initially, within minutes her hypotension acutely worsened and

became unresponsive to vasopressors. While diagnostic testing was ongoing, the patient developed ventricular tachycardia arrest. Advanced Cardiovascular Life Support (ACLS) protocol was initiated and commenced for approximately five minutes while the interventional team prepped for and performed an emergent pericardiocentesis. The hemopericardium was subsequently drained via a subxiphoid approach with resultant stabilization in hemodynamics. Protamine sulfate was administered to reverse heparin and attenuate the bleeding. A formal transesophageal echocardiogram (TEE) was performed to confirm resolution of effusion and preserved biventricular function; however, an evolving thrombus was visualized between the new SVC stent and tricuspid valve (TV) annulus (Figure 3A-B, Video 1-2). Aspiration thrombectomy was utilized to remove the mass in its entirety with return of baseline TV function. The patient was then transported to the intensive care unit for recovery. Over the next few hours her vasopressor requirements steadily decreased. She was eventually discharged from our institution on





**FIGURE 2:** Midesophageal modified bicaval view with biplane demonstrating 4 chamber view with right ventricle in focus. Mobile mass seen on the tricuspid valve. LA = left atrium, RA = right atrium, RV = right ventricle, TV = tricuspid valve.

post-operative day six without any neurological deficits or known sequelae.

### SVC Rupture and Cardiac Tamponade

Endovascular stenting has become the standard of care for SVC syndrome due to its generally favorable safety and efficacy profile. Though uncommon, stent placement can result in devastating complications such as SVC rupture and tamponade in 0.1% to 1.8% of cases.<sup>1, 2</sup>

Knowledge of the steps and duration of the procedure are crucial for anesthetic management and adequate preparation including monitoring, surgical back-up and utility of TEE. Furthermore, a strong awareness of potential complications during phases of the procedure is crucial for early recognition and intervention. Prompt recognition of SVC injury and tamponade are necessary to minimize mortality and optimize outcomes. Evaluation of contrast extravasation should be conducted after each critical step, such as passage of catheters or wires across the area

*Endovascular stenting has become the standard of care for SVC syndrome due to its generally favorable safety and efficacy profile.*

of stenosis, balloon dilation, and stent deployment.<sup>2, 3</sup> Once identified, immediate reinflation of the balloon can help tamponade and control the rupture.<sup>4, 5</sup> Covered stents are often utilized as definitive treatment for SVC disruption; however, collateral veins may become occluded in the process.<sup>6</sup>

### Role of Echocardiography

Echocardiography is the imaging modality of choice in cardiac interventional suites and operating rooms to visualize pericardial fluid and tamponade. Right atrial (RA) collapse,

commonly visualized during systole, is a very sensitive but less specific finding in tamponade. Though rarely observed alone as single chamber collapse, left atrial involution combined with RA collapse increases the sensitivity and specificity for tamponade.<sup>7</sup> Additionally, right ventricle (RV) free wall collapse may be seen during diastole due to increased pericardial pressure and decreased intracavity pressures. The duration of RV collapse is correlated to tamponade severity, as it directly relays the time in which pericardial pressures remain higher than RV filling pressures.<sup>7</sup> In the event of a catastrophic complication, multidisciplinary resuscitation efforts should be aimed at gaining control of the SVC hemorrhage, restoring cardiac output via emergent pericardiocentesis, and volume expansion to curtail hemodynamic instability. Emergency surgical and cardiopulmonary bypass backup should be considered in cases of prolonged hemodynamic instability.

### Challenges of the Environment

The environment in a hybrid operating room can provide many challenges for the anesthesiology team especially with cardiac patients. The fluoroscopy table and bulky equipment utilized by the proceduralist, can limit patient access and motion. Often the equipment can hinder airway access, make patient positioning difficult, and increase risk of injury (i.e., nerve injury).

In addition, many of these remote locations often lack trained personnel with insufficient experience. Most staff have limited experience with airway management and resuscitation, especially in the setting of an emergency often making the role of the anesthesiology team critical. Furthermore, depending on location, many remote facilities are often shared with the catheterization, electrophysiology, or interventional radiology teams and therefore may have inadequate post anesthesia care monitoring and/or resources for high acuity cardiac patients.

### Conclusion

This case highlights the importance of preparation including utility of TEE, clear commu-

*This case highlights the importance of preparation including utility of TEE, clear communication with the interventional team, and diligence in endovascular SVC interventions in a challenging location.*

nication with the interventional team, and diligence in endovascular SVC interventions in a challenging location. Anesthesiology providers should have a basic understanding of the procedural process and possible complications so that intraoperative hemodynamic perturbations can be rapidly recognized and treated appropriately. Furthermore, early diagnosis of tamponade and immediate drainage of pericardial fluid is crucial for survival. Without prompt identification of SVC rupture and hemopericardium, this patient may have been at risk for prolonged cardiovascular collapse and lasting multiorgan ischemic damage and death.

### References

1. Nguyen NP, Borok TL, Welsh J, et al.: Safety and effectiveness of vascular endoprosthesis for malignant superior vena cava syndrome. *Thorax*. 64:174-178, 2009.
2. Fagedet D, Thony F, Timsit JF, et al.: Endovascular treatment of malignant superior vena cava syndrome: results and predictive factors of clinical efficacy. *Cardiovasc Intervent Radiol*. 36:140-149, 2013.
3. Brown KT, Getrajdman GI: Balloon dilation of the superior vena cava (SVC) resulting in SVC rupture and pericardial tamponade: a case report and brief review. *Cardiovasc Intervent Radiol*. 28:372-376, 2005.
4. Funaki B: Superior Vena Cava Rupture and Pericardial Tamponade. *J Vasc Interv Radiol*. 34:1283-1284, 2023.
5. Jean-Baptiste R, Williams DM, Gemmete JJ: Successful treatment of superior vena cava rupture with placement of a covered stent: a report of two cases. *Cardiovasc Intervent Radiol*. 34:667-671, 2011.
6. Azizi AH, Shafi I, Shah N, et al.: Superior Vena Cava Syndrome. *JACC Cardiovasc Interv*. 13:2896-2910, 2020.
7. Perez-Casares A, Cesar S, Brunet-Garcia L, et al.: Echocardiographic Evaluation of Pericardial Effusion and Cardiac Tamponade. *Front Pediatr*. 5:79, 2017.

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## OMG! HOW DID ASE GET ITS *Fabulous Staff?*

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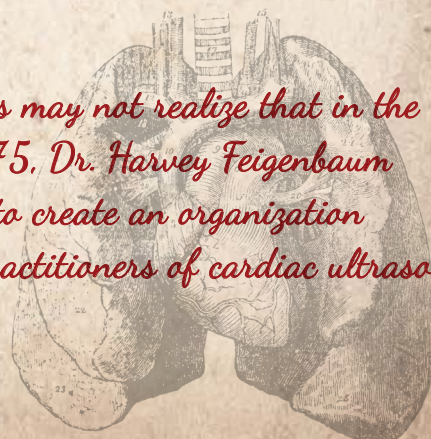
**D**o you remember Henry Wadsworth Longfellow's poem about the "midnight ride of Paul Revere?" Were you taught that Paul Revere warned the citizens of Concord and Lexington (MA) that "the Redcoats are Coming?" As with many famous attributions, it seems that Paul Revere did not really utter those words. But any member of ASE who has attended one of the Society's recent annual Scientific Sessions will recognize the red coats (blazers) worn by the ASE staff who keep the meetings running like a fine watch. And the many members who have served on ASE committees, councils, or task forces know that it's ASE's terrific staff who keep the Society's activities on track.

I suspect that how ASE came to have its fantastic professional staff is a story unfamiliar to many members, but it's an interesting one that provides some lessons. Newer members may not realize that in the autumn of 1975, Dr. Harvey Feigenbaum founded ASE to create an organization representing practitioners of cardiac ultrasound. He thought that such a professional organization was needed to address inequities in reimbursement for ultrasound studies provided and interpreted by physicians from different specialty backgrounds. In the first years, the annual meeting of ASE members was held during the Annual Scientific Sessions of the American Heart Association, largely because the academic physicians who were the earliest adopters of cardiac ultrasound generally attended that meeting in order to present their newest research. The many important activities that are central to ASE's current portfolio evolved over time, but in the first years there was little need for a formal administrative structure. As I recall, during Dr. Feigenbaum's



Contributed by **Alan S. Pearlman, MD, FASE**, ASE Past President, and Editor-in-Chief, Emeritus, *Journal of the American Society of Echocardiography (JASE)*

*Newer members may not realize that in the autumn of 1975, Dr. Harvey Feigenbaum founded ASE to create an organization representing practitioners of cardiac ultrasound.*





term as ASE's Founding President, correspondence was provided by his secretary in Indianapolis, Cheryl Childress. In 1979, the Society's "office" moved to Stanford, California, when Richard Popp became ASE's second President; his secretary, Gretchen Houd, dealt with ASE correspondence. Two years later, the Society's office moved down the coast to the University of California, Irvine, when Walter Henry became ASE's third President. Estelle Cohen, RN, who had accompanied Dr. Henry from the National Institutes of Health to UC Irvine, created a database of ASE members using an early computer system, looked after organizational activities, and provided administrative support.

An important inflection point occurred in 1983, when Dr. Joseph Kisslo became ASE's fourth President. Dr. Kisslo realized that as the Society continued to grow and as its activities expanded, it made good sense to have a permanent headquarters that did not move every two years to the office of whomever happened to be the next ASE President. In addition to his important involvement in the ASE, Dr. Kisslo was also active in the American College of Cardiology (ACC). Interested in investigating options for administrative support, he asked William D. ("Bill") Nelligan, III, CAE, then the Executive Direc-

**Figure 1:** ASE Board of Directors, June 2001.

Sharon Perry is in the bottom row, at the far right. She preferred being included in a "group" photo rather than in a photograph of her alone, since she consistently thought that her role was to assist the Board, and not to lead it. While she may appear to be "off to the side", note how she managed to keep the Board members in perfect alignment, in a subtle but effective way! Some readers should be able to identify many of the 2001 Board members, but that's not the point of this article.

tor of the ACC, for suggestions. Mr. Nelligan recommended that Dr. Kisslo talk with Michael S. Olson, CAE, an Association Executive who ran an association management firm based in Raleigh, North Carolina. Serendipitously, Mr. Olsen's offices were conveniently located, not far from Dr. Kisslo's home. Dr. Kisslo did consider several other firms that were involved in the management of professional associations, but the path forward became very clear at a meeting in Mr. Olson's office, at which time Mr. Olson announced: "I'd like you to meet the person I'm proposing to run your society." That person was Sharon Perry, CAE, (**Figure 1**) who served as ASE's executive director for 18 years!

I was fortunate to work directly with Sharon during my term as ASE's 10th President, and even more fortunate to speak with her recently. Sharon reminded me that she grew up in "rural eastern North Carolina" and graduated from North Carolina State University with a degree in French. Early in her career, she worked for several years for Pan American Airways. I would bet that this experience honed her remarkable ability to deal with people (most of whom were not nearly as gracious as she) in a pleasant and effective manner. She told me that after leaving Pan Am, she worked with the North Carolina Welcome Centers. Her travel industry connections led to the Travel Council of North Carolina and the Olson Management Group (OMG). Sharon joined OMG in 1979, and the Travel Council was one of her first assignments. Sharon followed a course of study through the American Society of Association Executives (ASAE) and became a Certified Association Executive (CAE). While she had four years of experience in association management by the time Dr. Kisslo wisely selected her as ASE's first Executive Officer, Sharon reminded me that the range of Associations, and the kinds of activities they conduct, is quite wide.

Sharon recalls that when Mr. Olson gave her the responsibility for the "ASE account" in 1983, the Society had about 2,000 members. Sharon and one other OMG employee, Phyllis Johnson, handled most of ASE's organizational activities, including keeping a current member database, tracking and collecting dues, and corresponding with members through the "ASE Communicator," which – in the days before electronic communication – was sent to members via the U.S. Postal Service. Other OMG staff provided assistance for some projects, but their primary responsibilities were to other OMG activities and not to its ASE account. In fact, ASE did not employ Sharon and Phyllis; instead, the Society paid a "management fee" to OMG for the professional management services they provided.

In 1998, Mike Olson was selected to serve as the President of the ASAE; he moved to Washington, DC (the location of ASAE headquarters) and sold OMG to FirstPoint, an organization based in Greensboro, NC. FirstPoint had evolved from the Greens-

boro Merchants Association, and although ASE was apparently its largest client, FirstPoint had limited experience working with a medical society. Sharon noted that FirstPoint had little understanding of the inner workings and staffing needs of a professional society; for example, membership records and financial reports were generic ("one size fits all") for all of the client associations. The ability to tailor services and reports specifically to meet ASE's needs was extremely limited. As you can imagine, the importance of collecting "dues" was of relatively low importance to "hospitality center" clients; however, for the ASE, dues collection was a key activity needed to fund Society initiatives. In addition, it seems that several different FirstPoint Vice Presidents were responsible for different divisions under the organizational umbrella.

In 2000, David J. Feild, CAE, moved to Raleigh and became the CEO of FirstPoint Management Resources. David was familiar with the ASE since he had served as the Executive Vice President of the ACC, and in that role knew many of ASE's leaders. I had worked with David through ACC, and we shared a fondness for Bernese Mountain Dogs! David did add some stability to the management company, but he was not involved in day-to-day activities of the ASE. Sharon Perry remained responsible for ASE's management, and as the Society's portfolio of activities grew, Sharon added other staffers whose efforts were dedicated to ASE activities, although they were employed by FirstPoint Management Resources and did not work for the ASE per se. One of those young staffers was named Robin Wiegerink (**Figure 2**).

I also had the opportunity to speak with Robin at some length and learned that she grew up mostly in North Carolina where her father was a professor at the University of North Carolina in Chapel Hill. Robin attended Hope College (her mother's and father's alma mater), where she majored in Public Relations. Returning to North Carolina, Robin worked for an advertising agency that also handled associations, and eventually applied for a position at OMG, which had the reputation as the "best association management company in the area". As an employee at OMG, she worked for the Travel Council of NC and the International Council on Geriatric Cardiology. In

1994-95, one of Robin's OMG assignments was the role of ASE's Associate Executive Director. I learned that at that time, about 7 OMG employees worked on ASE-related projects (but most of them had additional, "non-ASE" responsibilities).

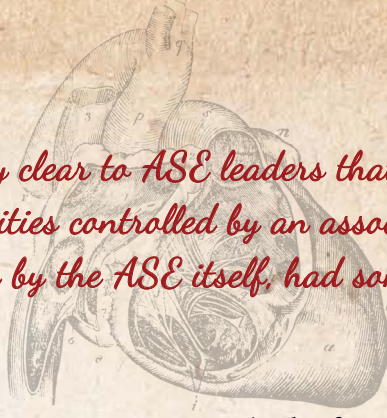
During my term as ASE President (1995-97), Robin lived in Seattle, and was employed by an association management company (Melby Cameron) based in the Seattle area, providing her with additional experience working as an Executive Director with several healthcare-related organizations. She also found the time to earn a Master of Nonprofit Leadership (MNPL) degree from Seattle University and a CAE from the ASAE. Robin moved back to the Raleigh-Durham area in 2000, and Sharon Perry quickly contacted her in a successful effort to persuade Robin to come back to FirstPoint. Robin reminded

me that in 2000, FirstPoint assigned 12 staff to work on ASE-related projects, but these professionals did not work for the ASE, nor did they work exclusively on ASE-related issues. Apparently, there were occasional circumstances (I'll use the term "differences of opinion") where the FirstPoint perspective was not well aligned with ASE's organizational needs. One example mentioned to me was ASE's desire - in the early years of the 21st century - to develop its own website. Apparently, FirstPoint felt that ASE's online profile and activities should be part of FirstPoint's digital profile, and not a separate project controlled by the Society itself.

It became increasingly clear to ASE leaders that having the Society's administrative activities controlled by an association management organization, rather than by the ASE itself, had some important downsides. According to ASE Past-President Thomas Ryan, who was part of the leadership group between 2005-2009, one of those downsides was that other organizations began to recruit Robin. Under the contract with FirstPoint, ASE officers were not able to offer Robin the title of Chief Executive Officer,

**Figure 2:** Robin Wiegerink, seen to the right in this photo taken with some ASE staff during an ASE Foundation outreach program in West Virginia. From left to right: Andrea Van Hoever, Lori Smith, Mary Carmody, and Robin.





*It became increasingly clear to ASE leaders that having the Society's administrative activities controlled by an association management organization, rather than by the ASE itself, had some important downsides.*

or to set her salary at a competitive level. Tom reminded me that in 2007 ASE embarked upon a project to study the feasibility of hiring its own staff. Harry Rakowski MD, FASE (ASE's 12th President) and Diane Millman, Esq (ASE's very smart attorney at the time) provided important input. Sharon Perry was asked to serve as a consultant to this project. In the end, a wise decision was made. ASE chose not to renew its contract with FirstPoint, and to hire its own staff whose loyalties were to the Society and not to an outside company that sometimes had different priorities. Tom Ryan reminded me that it is not uncommon for a professional association to move from hiring its own staff to hiring a professional management company, but quite unusual for an organization to leave an association management firm in order to hire, supervise, and pay its own staff. It seems quite evident that ASE's has been a success story!

Robin reminded me that at the present time, ASE has about 17,000 members and 40 staff with a variety of responsibilities. Space does not allow me to discuss every staff member or their assignments, but I must confess that I've been in contact with many of them, and they could not be more helpful. ASE's staff may know how to "speak Southern," but they also know how to do their jobs in an effective, professional, conscientious, and gracious manner. Obviously, the staff have learned the skills modeled by Sharon Perry and Robin Wiegerink.

Robin and I agreed that it would be proper and fitting to mention several longstanding staff members. Mary Alice Dilday served for decades as ASE's Associate Executive Director and lastly as Vice President of Internal Relations. Mary Alice was a dependable and always knowledgeable source of information and good advice about the nuances of ASE's activities, and – as one of ASE's Past Presidents reminded me, she "knew where the bones were buried." Having

retired a few years ago, Mary Alice is now herding her own cats, and not ASE committee members! I also had the good fortune to work with Rhonda Price, who was a key figure in the ASE Foundation's efforts to organize its Global Outreach program, allowing skilled sonographers and physicians, working on behalf of the ASE Foundation, to spend time and energy on a variety of medical "missions" in different locations in Asia, Central and South America, and several rural sites in the United States. By my count, the Global Outreach program has now affected nearly 20 sites, spreading knowledge and goodwill, and enhancing patient care. Another very noteworthy, skilled, and longstanding ASE staff member, Andrea Van Hoever, currently serves as the Deputy Director for both the ASE and the ASE Foundation. Andrea has provided support for over 21 years; she is exceptionally well-organized and has been a terrific resource to ASE members and to the International Alliance Partners.

Over the years, our two executive leaders (Sharon and Robin) have done a spectacular job in advising our volunteer leaders, providing continuity, identifying and hiring additional staff when new activities required additional administrative support, or when one or another staff member retired or moved on to other opportunities. I cannot comment individually on each of the ASE's current staff members, nor do I have the space to praise the professionalism and skills of the many staff who have helped me over the years. However, I can say with confidence that we are lucky to have such a fabulous professional staff.

**Acknowledgment:** I'm indebted to Sharon Perry, CAE; Robin Wiegerink, MNPL, CAE; Joseph Kisslo, MD, FASE; and Thomas Ryan, MD, FASE for taking the time to talk with me and to help me get the details right. I am fortunate to count them among my good friends.

# ASE FOUNDATION GLOBAL HEALTH OUTREACH EVENT TO **Vietnam** 2023

Contributed by **Judith Becker, MD,**  
**Joan Brennan, RDCS,** and  
**Jane Marshall, RDCS, FASE**

**JN** September 2023, after a three-year delay due to the COVID pandemic, a team of 14 cardiologists and cardiac sonographers from across the U.S. participated in an ASE Foundation (ASEF) Global Health Outreach Event in Vietnam. Our project was part of an ongoing collaboration between Dr. Hoai Nguyen and her colleagues of the Bach Mai Hospital in Hà Nội, and Dr. James Kirkpatrick and Dr. Jose Banchs in the U.S. It was coordinated and facilitated by Andrea Van Hoever, Deputy Director of ASE and ASEF, who managed the enormous amount of detail, guiding, and advising the team members as we prepared for and embarked on our journey. Most of our team had never met and had no idea what to expect from this outreach event. What transpired over the week in Hà Nội and in northern Vietnam was nothing less than life changing.

The team gathered in Hà Nội and the following day began the five-hour bus trip to the town of Sa Pa, in the Hoàng Liên Sơn mountains, in Northwest Vietnam. Our task was to participate in the cardiac evaluation of 852 patients and provide gold standard scans to compare to those performed by local nurses recently trained in screening cardiac ultrasound exams. The patients spanned all ages, from infants to older adults, and were from the underserved Vietnamese hill tribes including the Red Dzao and H'mong. The plan is for the nurses to provide continuing care to these communities.



The screening, which took place in a large building resembling an old airplane hangar at the Sa Pa General Hospital, included a thorough history, ECG, vital signs, and blood work on each patient. Assisted by support teams from Philips Vietnam, Hamedco Medical Devices, Medivest, and Dr. Lab, who provided equipment and logistical support, the local and U.S. medical teams conducted echo exams as the last piece of the evaluation. The results were provided to the Bach Mai Hospital team for use in clinical visits. There were many newly diagnosed pathologies revealed, including rheumatic heart disease, segmental wall motion abnormalities, congenital heart disease, aortic pathology, etc., some requiring immediate referral to a higher level of care. The first day there were about 350 patients screened, and by word of mouth the next day almost double that number lined up for evaluation. It was very humbling to meet these individuals who were so respectful and grateful for the opportunity to participate in this medical screening program, many of whom patiently waited for hours to be seen.

After two days of scanning, we then traveled back to Hà Nội, to the Bach Mai Hospital for the two-day Vietnam-America Echocardiography Symposium supported by Philips Vietnam.

The conference welcomed more than 150 attendees, including fellows in training, staff cardiologists, and clinicians from various regions across Vietnam. Over the two days, presentations were given by cardiologists and sonographers from the ASEF team, the Bach Mai Hospital cardiologists, and local physicians. Topics covered a broad range including structural heart disease & treatment, cardiac oncology, artificial intelligence in echocardiography, fetal echo cases, multimodality imaging, and various lectures on technique & optimization of the echo exam. Cases were also presented for discussion, diagnosis, and management decisions, and there was a hands-on fetal teach-

ing session provided by the pediatric members of the ASEF team. Many of the sonographers were first time presenters, and were extremely nervous but delivered their talks beautifully. We also toured the Bach Mai Hospital Cath Lab as well as adult and pediatric cardiac wards.

On our final evening we enjoyed a special dinner, feasted on wonderful local food, exchanged gifts and sentiments, and sadly said “goodbye for now” although we know the collaboration will continue as the data obtained from the screenings is reviewed and prepared for publication. And even though miles apart, the email thread continues between team members with a reunion already in the planning stages for the next ASE Scientific Sessions.

Getting to know each other on the bus ride to Sa Pa.



Welcome to Sa Pa General Hospital.



Outside the work days, which honestly did not feel like work at all, we were immersed in the culture of Vietnam, sampling different locally made foods, shopping at local markets, and seeing historic sites together. Before and after the medical event, some of us added 1-2 days of touring. We visited Ngoc Son Temple, the Temple of Literature, the mausoleum of Hồ Chí Minh, and the famous “Hà Nội Hilton” where John McCain was a prisoner of war.

We finished our touring at the Thang Long Water Puppet Theatre, a visual and musical experience, which takes place in a waist-deep pool of water with the puppets moving along on the water’s surface, the puppet masters hidden from view behind a screen and the murky water. Musicians on either side of the pool of water provided vocals and music on traditional instruments.

Our hotel was located centrally in the Old Quarter close to Hoàn Kiếm Lake, which is a popular stop for wedding photos and morning workouts. “Ho Hoàn Kiếm” means “Lake of the Returned Sword” alluding to the legend that the Vietnamese Emperor Lê Lợi received a sword from a magic turtle at the lake’s edge. Lê Lợi drove the Chinese out of Vietnam with the sword, returning it to the turtle after the



Scanning stations at Sa Pa General Hospital.



Big smiles and proud hearts at the conclusion of the medical screening event in Sa Pa.

Participating in the Vietnam-American Echocardiography Symposium at Bach Mai Hospital in Ha Noi.



invaders had left. This story is depicted by the enchanting aquatic marionettes at the Thang Long Water Puppet Theatre.

In a stroke of good fortune, we were in Hà Nội for the start of the “Tết Trung Thu” or the Mid-Autumn Festival. We joined festival goers at night watching lion dancers in the streets and tasted traditional “mooncakes.” Mooncakes, usually eaten outside, under the light of the moon, are molded with elaborate details of flowers, carp, and geometric patterns, and come in a seemingly infinite variety of flavors,

both sweet & savory. We were gifted some of these special delicacies by our hosts, which were made locally by a relative of one of the Vietnamese doctors.

Soon it was time to return home. We can say with certainty that our outreach trip to Vietnam was a success for all of us and our patients. A wonderful experience which we hope to repeat!

[Learn more about the Vietnam 2023 Global Outreach Event.](#)

## TEAM LEADERS

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James Kirkpatrick MD, FASE – University of Washington Medical Center, Seattle, Washington  
Hoai Thi Thu Nguyen, MD, PhD – Vietnam National Heart Institute, Bach Mai Hospital, Hà Nội, Vietnam

## MEDICAL TEAM

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Joan Brennan, RDCS – Hackensack Meridian Health, Toms River, New Jersey  
Eglé Burdulis, RDCS, FASE – Dartmouth-Hitchcock Medical Center, Lebanon, New Hampshire  
Can Thuy Do, MD – Vietnam National Heart Institute, Bach Mai Hospital, Hà Nội, Vietnam  
Danielle Gravin, RDCS – University of Michigan, C.S. Mott Children’s Hospital, Ann Arbor, Michigan  
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# HIGHLIGHTS FROM ASE'S MULTIMODALITY IMAGING FOR CARDIAC SURVEILLANCE OF CANCER TREATMENT IN CHILDREN GUIDELINE

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**D**ue to remarkable progress in pediatric cancer therapy over the past decades, more than 80% of children diagnosed with cancer today can expect to survive well into adulthood. At the same time, survivors face a high burden of morbidity and mortality, in particular cardiovascular disease (CVD), the leading non-cancer cause of late mortality in this population. Current practice employs longitudinal monitoring of echocardiographic measures of the left ventricle (LV) systolic function for screening and detection strategies for CVD in children with cancer.

However, there is significant variability in practice and lack of standardization in cardiovascular imaging methods used to perform cardiovascular screening in this population. The ASE guidelines developed by a multidisciplinary expert consensus panel of pediatric and adult cardiologists, pediatric oncologists, and experienced pediatric sonographers provide recommendations for the standardization of echocardiographic and multi-modality cardiovascular imaging assessment of cardiac function in pediatric cancer patients.

Cardiovascular complications after cancer treatment include LV dysfunction, cardiomyopathy, heart failure (HF), coronary artery disease, stroke, pericardial disease, and valvular and vascular dysfunction. The effects of anthracyclines and chest radiation have been well described. But there are several other established and newer cancer treatments with potential cardiovascular sequelae, and their cardiovascular toxicities are an area of active investigation (Figure 1). The primary goal of cardiac monitoring is to identify early signs of potentially reversible heart disease and seek to prevent progression of CVD to more advanced stages of heart failure. Prior to starting cardiotoxic treatment, a full baseline structural and functional echocardiogram should be performed. During the cancer treatment, echocardiographic screening for early detection of cardiac dysfunction is recommended. The frequency of screening will depend on the protocol and doses of cancer treat-

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Contributed by **Hari Narayan, MD, FASE, MSCE, Melissa Wasserman, RDCS, RCCS, FASE, Ruchira Garg, MD, FASE, Luc Mertens, MD, PhD, FASE, and Gautam Singh, MD, FASE**











ment used and other coexisting risk factors. Withholding cancer treatment requires multidisciplinary decision-making and must be made cautiously. After completion of treatment, cardiac surveillance is recommended at least every two years for high-risk and every five years for moderate-risk patients.

### Echocardiography

Echocardiography remains the primary cardiac imaging technique for children before, during, and after cancer therapy, with focus on both cardiac structure and function. This tailored echocardiogram should

include assessment of LV dimensions, volumes and mass, as well as assessment of left and right ventricular systolic and diastolic function, valve function, and the pericardium. However, with so many echocardiographic techniques and measurements available, our aim is to provide guidance on which ones to use routinely in this specific patient population.

**FIGURE 1: Overview of the cardiovascular effects of cancer treatments and use of imaging modalities.** HTN, Hypertension; LVD, LV dysfunction; TK, tyrosine kinase.

Cardiac effect	 LVD/HF	 Myocarditis	 Arterial Thrombosis	 Atherosclerosis, Coronary Spasm	 Pericardial disease	 Valve Disease	 HTN	 Pulmonary HTN or fibrosis
<b>Conventional Therapies</b>								
<b>Anthracyclines</b>								
<b>Platinum-based</b> Cisplatin								
<b>Alkylating Agents</b> Cyclophosphamide, Ifosfamide								
<b>Vinca Alkaloids</b> Vinblastine, Vincristine								
<b>Antimetabolites</b> 5-fluorouracil (5-FU), Capecitabine, Cytarabine								
<b>Microtubule Inhibitors</b> (primarily used in adults) Paclitaxel, Docetaxel								
<b>Targeted Molecular Therapies (primarily used in adults)</b>								
<b>VEGF Antibodies</b> Bevacizumab								
<b>VEGF TK Inhibitors</b> Sunitinib, Pazopanib								
<b>BCR-ABL TK Inhibitors</b> Imatinib								
<b>Proteasome Inhibitors</b> Bortezomib, Carfilzomib								
<b>Radiation</b>								
<b>Steroids</b>								
<b>Imaging</b>								
<b>Echo*</b> (preferred screening modality)								
<b>CMR*</b>								
<b>CT*</b>								

For serial assessment of LV chamber size and wall thickness, linear dimensions of the LV cavity, inter-ventricular septum, and posterior wall should be measured based on 2D or M-mode. For measuring LV volume and mass, the method of disks or area-length methods are recommended. The measurements should be corrected for body size, and Z scores should be included in the report. We recommend using the Pediatric Heart Network normative Z scores.

A standardized protocol for measuring functional parameters must be developed. Each laboratory should consistently utilize standardized methods for serial assessment of LV function. The method used should be identified in the report. We recommend the use of LV ejection fraction (EF) for monitoring LV function in children with cancer. We recommend using the biplane method of disks for calculating EF. In cases where the apical images are suboptimal, the 5/6 area-length method can be a recommended alternative. Global longitudinal strain (GLS)

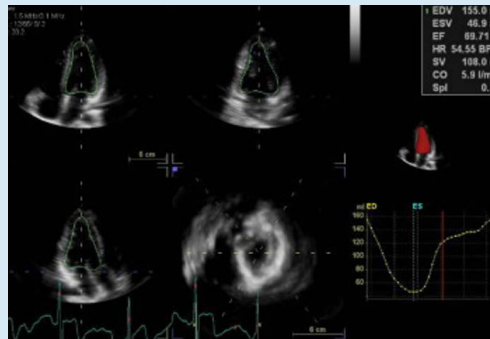
measurement by speckle-tracking echocardiography is a reproducible measurement of LV function that should be included in the assessment of LV function. Although, the predictive value of an early decrease in GLS during treatment and in long-term survivors is uncertain in the presence of preserved EF at the present, utilizing different measures of LV function for serial assessment, such as a 2D and 3D EF combined with GLS may allow reliable detection of early changes in cardiac function. We recommend adding GLS as an additional measurement to follow children after cancer treatment.

Evaluation of diastolic functional parameters, such as mitral inflow velocities, tissue Doppler velocities at the septal and mitral valve annulus and left atrial volume, are recommended, although their interpretation can be challenging. Left atrial volume is considered the most reliable parameter of diastolic function in children and should be included as part of a serial echocardiographic assessment. For right ventricular

**TABLE 1**

**LVEF 3D echo**      **Apical 4 chamber 3D volume**

- 3D volume should include entire LV avoid foreshortening or stitch artifacts.
- Temporal resolution of >20-25 volumes per second.
- Fully automated border detection available.

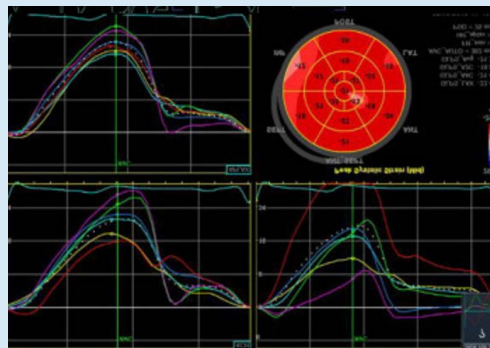


- No geometrical assumptions.
- Automated analysis available.
- Reproducible.
- Normative pediatric data available.

- Image quality- dependent.
- Lower temporal resolution.
- Requires cooperation.
- Specific transducers and software analysis package needed.

**LV GLS STE**      **Apical 4 chamber, Apical 2 chamber, Apical 3 chamber**

- Image optimized for myocardial definition; avoid foreshortening or dropout.
- 3 views selected should have similar heart and frame rates with clear electrocardiogram tracing
- Visual inspection to ensure accurate tracking of LV walls; analysis excluded if more than 2 segments per view show poor tracking.



- Highly reproducible.
- Automated analysis.

- Image quality dependent
- Heart and frame rates need to be comparable in all 3 views.
- Specific software analysis package needed.
- Vendor dependent.

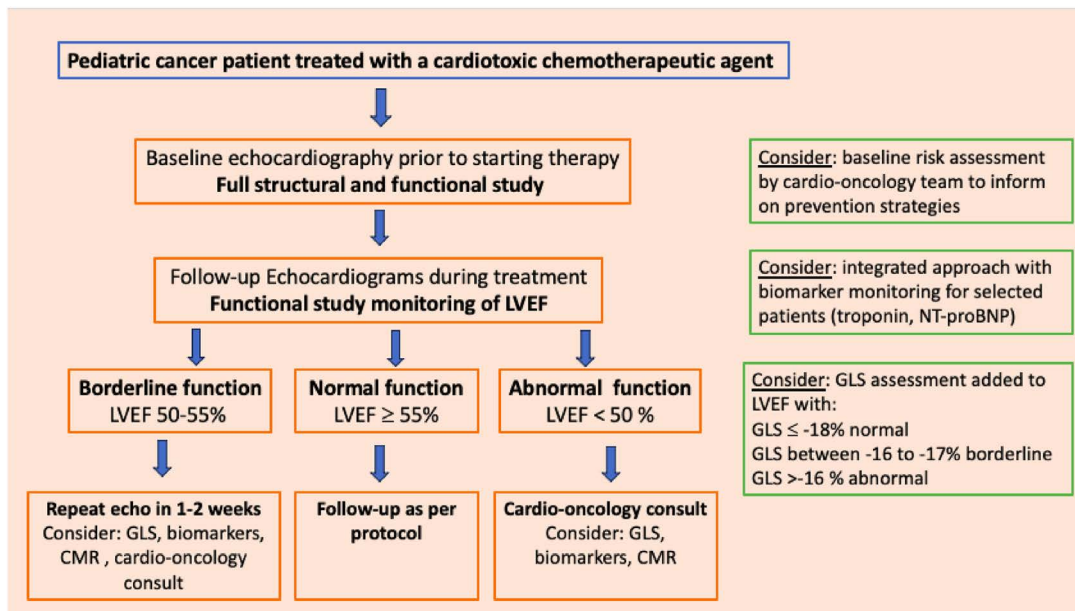
(This figure is from Multimodality Imaging for Cardiac Surveillance of Cancer Treatment in Children: Recommendations From the American Society of Echocardiography, published in the December 2023 *Journal of the American Society of Echocardiography*. Reprinted with permission from Elsevier Inc.)

assessment, an RV size measurement, such as RV basal diameter; together with a right ventricular functional parameter such as RV FAC, is recommended.

We summarize the advantages and pitfalls, as well as how to perform all recommended echocardiographic measurements in a Table in the Guidelines,

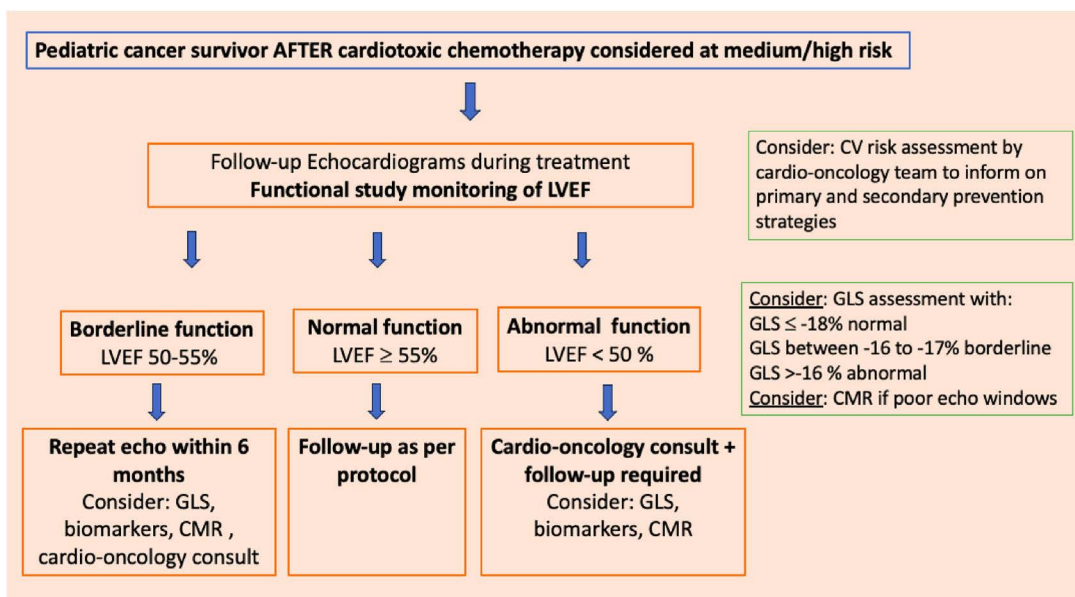
a part of which is reproduced for 3D LV EF and LV GLS in Table 1.

Guidance for monitoring of cardiac function in children with cancer during treatment with cardiotoxic agents is highlighted in Figure 2 and after treatment in Figure 3.



**FIGURE 2:** Monitoring of cardiac function in children with cancer during treatment with cardiotoxic agents

(This figure is from Multimodality Imaging for Cardiac Surveillance of Cancer Treatment in Children: Recommendations From the American Society of Echocardiography, published in the December 2023 *Journal of the American Society of Echocardiography*. Reprinted with permission from Elsevier Inc.)



**FIGURE 3:** Monitoring of cardiac function in children with cancer after treatment with cardiotoxic agents.

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## Use of CMR in Evaluating Children with Cancer

Echocardiography is the primary imaging modality for cardiac evaluation of this population; however, there are certain, specific indications for which CMR could be considered in pediatric cancer patients:

1. If echocardiographic images are poor and it is difficult to reliably assess ventricular function
2. When borderline (EF 50–55%) or abnormal (EF <50%) LV function is detected by echocardiography and an alternative modality is desired.
3. For tissue characterization in suspected myocarditis.
4. For suspected constrictive pericarditis.
5. For cancer involving the heart.

The protocol must include biventricular volumes, mass, and ejection fraction. All the other CMR techniques are considered optional and can be considered. These include assessment of LV diastolic function using phase-contrast or tissue-phase mapping, and measurement of atrial volumes. Also, myocardial deformation imaging by various techniques such as tagging, strain and feature tracking can be considered for advanced assessment of global and regional myocardial dysfunction. These advanced assessments of cardiac function by CMR have considerable technical variability and lack standard values in pediatric cancer patients to endorse routine use. Tissue characterization to assess myocardial fibrosis, edema and iron load can be included when clinically indicated.

## CardiacCT

When both echo and CMR are not adequate or feasible, cardiac CT can determine biventricular volumes and EF. Surveillance of adults for atherosclerotic coronary artery (CA) disease with CA calcium scans can be considered at 5–10-year intervals after radiation therapy (RT). Coronary CT angiography is appropriate in survivors >18 years to assess for RT-related atherosclerotic disease.

## Knowledge Gaps

The guidelines highlight the gap in standardized approach in the current practice of cardiac monitoring and identify important knowledge gaps on the predictive value of echocardiographic measurements during and after cancer treatment.





# 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.*