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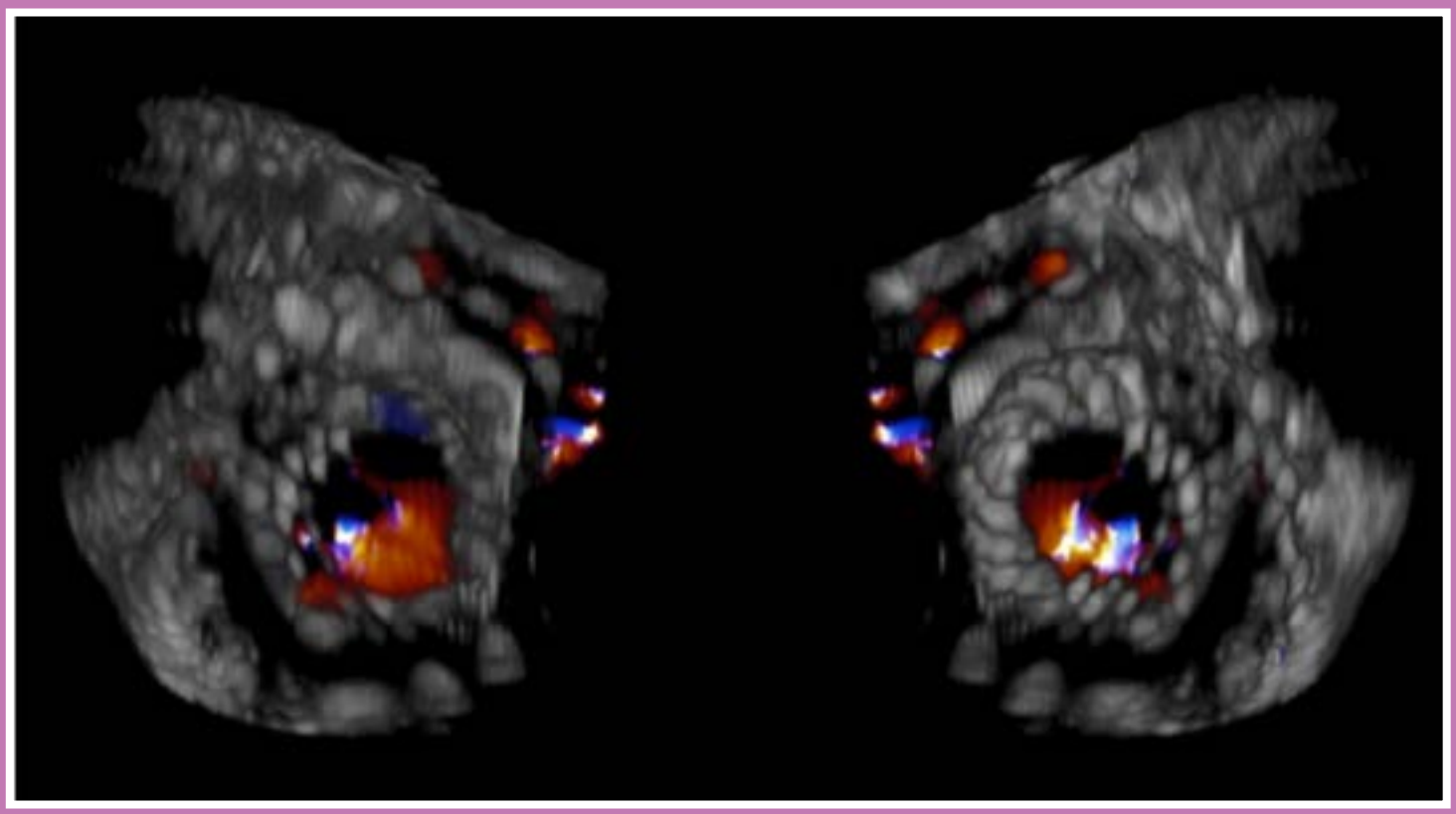

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This text also appears in the November JASE. ***OnlineJASE.com***

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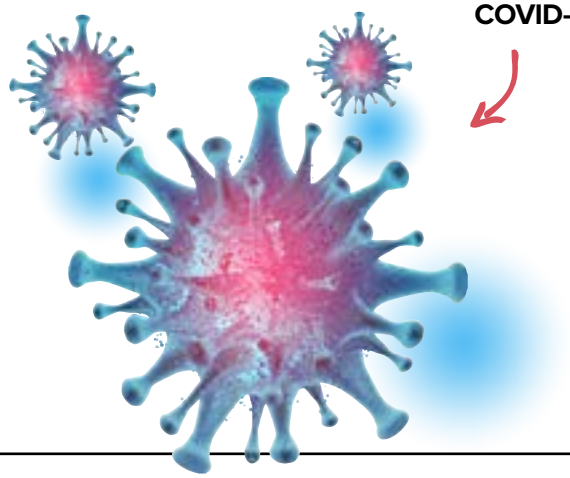

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Cover art: "Whoot!! Whoot!!" Kathryn Zeigler, BS, RDCS, FASE, and Katarzyna Kurnicka, MD, PhD, Medicover Hospital, Warsaw, Poland

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 PIVOTAL ROLE OF ASE IN PROMOTING EARLY CAREER CLINICIAN SCIENTISTS

*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 **Daniel E. Forsha MD, MHS, FASE**, Imaging Research Director of the Ward Family Heart Center at Children's Mercy Kansas City and Associate Professor, University of Missouri-Kansas City School of Medicine*

In this month's President's Message, I would like to continue my theme of highlighting ASE's core values. I believe that our Society's commitment to scholarly activities and cutting-edge research truly embodies our core values of ***excellence*** and ***advancing knowledge***. These research efforts are pivotal to our membership and to our strategic vision to be the leader in all facets of cardiovascular ultrasound. I have asked Daniel Forsha, co-chair of our Research Committee, to update our members regarding our research mission at ASE and how it has impacted his and many others' academic careers.

I believe that our Society's commitment to scholarly activities and cutting-edge research truly embodies our core values of **excellence** and **advancing knowledge**.

In life, we remember our firsts. Our first car, our first house. But these impactful moments are not restricted to our personal lives. The firsts in our lives as medical professionals are a primary determinant of the shape of our career arcs: the first mentor who truly inspired us, the first patient who impacted how we view medicine, the first time we shared the grief of a patient who died with their family or the joy of a patient who unexpectedly lived. For the clinician-scientist, an early career research grant often serves as an important "first" that often comes at a vulnerable time in our lives when modest funding opportunities can change the arc of our careers. I remember well my first primary investigator grant award. This golden moment was the culmination of long hours of study, writing, mentorship, and external support. This small grant was not game changing for our field, but it changed my path from a planned clinical imager to one of an imaging clinician-scientist. Continuing to maintain a strong pipeline of young talent who chose to commit to research is game changing for the field. Nearly all physicians whose research significantly impacted the field received grant support in their fellowship or early career.

Helping trainees and early career cardiac imagers achieve this first in their own careers is a critical role that ASE should continue to fill. Early

career funding is challenging for any physician-scientist and is always highly competitive with a typical grant success rate of only 10-20%. At the federal level, early career investigators (ECIs) who are physician-scientists often must compete with PhDs who have more extensive research backgrounds and generally more dedicated time to devote to grant procurement and generation of preliminary data. The path to funding for specialties outside of adult cardiology, such as my field of pediatric cardiology, must also deal with research topics and populations that are unfamiliar to most grant reviewers.

ASE has historically been an intermittent grant funding body. However, increasingly the Society has focused on promoting specifically the ECI. The E21 research awards promoting ECI clinician-engineering partnership led to most of those awardees using their E21 data to secure NIH funding in both adult and pediatric cardiology. The Pamela S. Douglas Research Scholar Award provides a regular and competitive grant application process for ECIs in cardiac imaging to keep their research momentum around the time of faculty transition. Most recently, the Research Committee chairs (Jonathan Lindner and me) have teamed with Dr. Jim Kirkpatrick, staff from ASE, and the ASE Foundation to collaboratively develop the EDGES (Early-career Development Grant for Echo Scientists) research program. These grants provide funding to ECIs who are on a path towards a career in echo research but need a source of funding to maintain their trajectory and momentum as scientists. These grant mechanisms are each modest in their funding and scope, but the intent is to unlock the door to a larger future in four ways:

1. **Fund the early research that will produce preliminary data necessary for a larger grant application.**

2. **Demonstrate their research potential to their division and institution whose support will be critical for their development.**

3. **Provide that critical positive feedback for the early career imager who is unsure if they can successfully attain funding.**

4. **Build a foundation for launching a research career separate from their mentors.**

They will also forever tie the memory of this golden moment to their relationship with ASE.

Why is ASE optimally positioned to fill this role? ASE is the home for echocardiography. Odds are that any young imager considering a research career is already an ASE member. As their home, ASE should provide the necessary pieces to start down the research path. With a fund-raising arm (ASE Foundation), dedicated veteran researchers to guide and mentor, and a high impact factor journal (JASE), the infrastructure is already in place. And our strategic vision for the future of ASE research includes maintaining regular and competitive grant RFAs aimed at supporting our ECIs through the current internally funded mechanisms and expanding to facilitate relationships between our ASE members and external foundation and industry partner sponsors. We appreciate the importance of funding success in the early career and will strive to find new and creative methods to fund our members, keeping that critical pipeline supplying the cardiac academic path healthy and strong.

Will every young researcher who wins one of these awards go on to innovate the landscape of echocardiography? Probably not, but each winner earns that foundational piece of the funding puzzle necessary to start down that path. their first.

This text also appears in the November JASE.
OnlineJASE.com

Benjamin W. Eidem, MD, FASE
ASE President

Sonographer

VOLUNTEER OF THE MONTH-NOVEMBER

Congratulations

Katie Jo Stauffer, BS, RDCS, FASE

Lead Pediatric Cardiac Sonographer
Stanford Medicine Children's Health

Q
A

When and how did you get involved with cardiovascular ultrasound?

I knew quite early on that this was the career I wanted to pursue. In high school, I began exploring medical careers, and at the age of 15, had an emergency appendectomy. The sonographer who diagnosed my appendicitis in the middle of the night told me what a great career she had, so I started exploring ultrasound. Once I discovered cardiovascular ultrasound and then congenital heart disease, I was hooked! I chose Seattle University's excellent Diagnostic Ultrasound bachelor's degree program and their echocardiography track with a specialty in pediatric echocardiography.

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

I am currently a part of Stanford Medicine Children's Health at Lucile Packard Children's Hospital (an academic medical center), where I've been a pediatric and fetal cardiac sonographer for 14 years, and the Lead Sonographer/Technical Director/Educator for the past seven years. I am also the designated Clinical Instructor for Seattle University student sonographers that train at our institution, a role I've played for over 10 years.

When and how did you get involved with the ASE?

I joined ASE very early on in my career. I was drawn in by the excellent educational offerings and the outstanding

> **"As a volunteer with ASE, I'm given the chance to give back in a small way to the community of cardiovascular ultrasound that has been my home for so many years."**

annual Scientific Sessions. In 2018, I applied for, and was granted the Fellow of the American Society of Echocardiography (FASE). In 2019, I applied for my first volunteer position as a sonographer representative with the ASE Pediatric and Congenital Heart Disease Council Steering Committee.

Why do you volunteer for ASE?

As a volunteer with ASE, I'm given the chance to give back in a small way to the community of cardiovascular ultrasound that has been my home for so many years. I love being a part of all the amazing work taking place within ASE. It is incredibly rewarding to be an integral part of this organization that has such a huge impact in my field - advocating, educating, advancing technology, and setting the industry standards for the critical work that we do.

With the help of ASE, more institutions increasingly appreciate the deep value that sonographers bring to the field of cardiovascular ultrasound.

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

I recently completed a three-year term as the Pediatric and Congenital Heart Disease Council representative to the ASE Foundation Annual Appeals Committee. This committee does amazing work in fundraising for the ASE Foundation to support all of the incredible missions of ASE that are not covered by membership dues, such as global outreach, scientific research, scholarships, travel grants, and much more. I currently also serve as co-chair of the Career Development Subcommittee of the Society of Pediatric Echo (SOPE), and co-chair of the newly developed Sonographer Subcommittee of the Fetal Heart Society. In the past, I have volunteered with the American Registry of Diagnostic Medical Sonographers (ARDMS).

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

I highly recommend getting involved with ASE as a volunteer! ASE offers so many amazing opportunities, from working in charitable fundraising, to guidelines and standards, to numerous task forces, to cardiovascular ultrasound advocacy, to advising vendors on technology, and so much more. Find an area of ASE that you are passionate about and get involved! As a volunteer with ASE, you get the opportunity to make a difference, take a front seat to everything happening at the forefront of cardiovascular ultrasound, as well as build life-long friendships and connections.

What is your vision for the future of cardiovascular sonography?

I am inspired by what I see happening for cardiovascular sonographer careers across the country. With the help of ASE, more institutions increasingly appreciate the deep value that sonographers bring to the field of cardiovascular ultrasound. This is opening up new career and growth opportunities for sonographers in addition to imaging patients. Roles such as educators, researchers, sonographer managers, and advanced practice sonographers are being developed at many institutions. I am so excited to participate in this development and to watch our profession grow in the coming years.

I am also thrilled to be a part of the movement within the world of pediatric echo to adapt advanced technologies such as 3D echo, strain imaging, ultrasound enhancing agents, and vector flow imaging for routine clinical use in our unique patient population.

Tackling the Problem of

Interventional Echocardiography Training

*Contributed by **Rebecca T. Hahn, MD, FASE**, Division of Cardiology, Department of Medicine, Columbia University Medical Center/ NY Presbyterian Hospital, New York, NY*

THE INTERVENTIONAL ECHOCARDIOGRAPHY (IE) specialist is integral to the function of the Structural Heart Disease (SHD) Team.[1] Training program guidelines, standards, credentialing, and board examinations for echocardiography have been developed and adopted,[2] with the 2019 ACC/AHA/ASE Advanced Training Statement on Echocardiography[5] alluding to the specialized training that this new field might require. In addition, the 2019 AATS/ACC/ASE/SCAI/STS Expert Consensus Systems of Care Document for valvular heart disease[3] identifies the need for an echocardiographer with expertise in valve disease and transcatheter and surgical interventions for all levels of care, but specifically the need for an IE to provide imaging guidance for transcatheter and intraoperative procedures for comprehensive Level I care. Recent recommendations from ASE define the core competencies in the field and offer a possible framework for required procedural numbers to acquire these competencies.[4] This document importantly emphasized that the length of IE training or achieved procedure volumes are less important than the demonstration of procedure-specific competencies within the milestone domains of knowledge, skill, and communication. Although procedural numbers have traditionally been viewed as a pathway to competency, this is clearly dependent upon the variety of case pathologies and the competency of the faculty; a SHD program in an academic center with access to both commercial and investigational devices may offer a different training experience to a lower volume non-academic program. The length of training to achieve those numbers is highly dependent on the training site procedural numbers and referral patterns; a tertiary care center may offer a mix of simple and complex procedures compared to a community hospital.

Recent recommendations from ASE define the core competencies in the field and offer a possible framework for required procedural numbers to acquire these competencies.

The current graduated medical education based on an apprenticeship model significantly limits current training of IE specialists given the requirements of high volume, broad range of case complexity, and expanding the variety of procedures.

The current graduated medical education based on an apprenticeship model significantly limits current training of IE specialists given the requirements of high volume, broad range of case complexity, and expanding the variety of procedures. This could limit advanced training to a limited number of institutions5 and further dichotomize care. The following is a suggested construct for an introductory IE training program that could shorten the learning curve for fellows in training as well as address the early educational needs of fully trained practitioners. This program could provide standardization of the initial knowledge and skill core competencies outlined by the ASE "Recommendations for Special Competency in Echocardiographic Guidance of Structural Heart Disease Interventions."[4]

Introductory Training Program for the Interventional Echocardiograper

1. ***Complex, three-dimensional anatomy:*** Using three-dimensional visualization has been shown to be a more effective method to gain factual and spatial anatomical knowledge compared to traditional methods.6 The three-dimensional (3D) visualization methods could include:
   a. computer-based 3D methods,
   b. 3D augmented reality methods,
   c. 3D virtual reality methods, and
   d. cadaveric models.

2. ***Indications and contra-indications for SHD procedures:*** The IE specialist should be well versed in the pathophysiology, imaging diagnosis and management options of various cardiovascular disease processes.[7,8] This enables the IE specialist to screen patients for disease severity and the need for intervention. Training would focus on the quantitation of valvular heart disease as well as the anatomic criteria for SHD intervention feasibility. This will require training in the acquisition and interpretation of echocardiography (both TTE and TEE) as well as the basics of CT planning for valve interventions (i.e., aortic, mitral, and tricuspid valves) as well as left atrial appendage closure.

3. ***Fluoroscopic imaging and catheter motion:*** Coregistration of echocardiographic and fluoroscopic imaging has significantly enhanced the communication between the interventional cardiologist/proceduralist (IC) and the IE. Even in the absence of co-registration however, it is essential to have cross-disciplinary imaging recognition in order to improve procedural guidance. Toward that end, Katsiampoura and colleagues developed a novel fluoroscopic phantom cardiac model with enhanced structural markers to display the basic fluoroscopic images used during SHD interventions.[9]

4. ***Transesophageal image acquisition and probe manipulation:*** Similar to training for the IC,[5,10] training IE specialists in the manipulation of the TEE probe for image acquisition, as well as optimizing the use of software tools to enhance image rendering requires repetitive performance in a time-limited clinical exposure to perfect the "knobology" and eye-hand coordination required for intra-procedural guidance. The more complex the procedure, the greater the number of probe manipulations which increases the risk for esophageal injury[11] and exposure of the IE specialist to radiation.[12] Simulation training has been supported by the recent ASE "Recommendations for Special Competency in Echocardiographic Guidance of Structural Heart Disease Interventions" as a means of shortening the learning curve for IE specialists4 however improving the efficiency and accuracy of image acquisition should also reduce the risks associated with this new sub-specialty, for

the patient and the imager. The goals of this training could include:

a. computer-based TEE simulators to teach standard imaging views/levels,[13]
b. physical TEE simulators to teach manual manipulation dexterity,[14,15]
c. beating heart models with real-time TEE imaging on commercially-available equipment to learn equipment-specific image manipulation.

5. ***Complex Case Planning:*** The IE specialist is often required to interpret pre-procedural imaging for the morphology and severity of valve disease, and thus the appropriateness of SHD interventions. This can be accomplished by lectures and case-based studies, augmented by off-line analysis of images using commercially available CT and echo software packages.

6. ***Recognition and/or Mitigation of Complications:*** A library of common and rare complications could be developed to allow a case-based approach to the recognition of complications and possible ways to avoid or manage these complications. Online training or webinars that allow for interaction with experts on the Heart Team would enhance this training on an ongoing basis, particularly as the field continues to evolve, and provide a resource for IE specialists around the world.

Summary

Interventional echocardiography is a new subspecialty within cardiology and anesthesiology, which requires advanced skills in performing and interpreting echocardiographic and CT studies, as well as guiding interventional procedures. A concerted effort is required on the part of the physician, hospital, and societies to standardize the training of IE specialists in order to develop a path to certification, and in doing so, also provide the justification for adequate compensation for this highly specialized imager.16 The above proposal for is just one possible approach to that standardization.

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Disclosures: Dr. Hahn is a speaker for Boston Scientific and Bayliss; a speaker and consultant for Abbott Structural, Edwards Lifescience, Philips Healthcare, Siemens Healthineers; a consultant for 3Mensio, Medtronic, Navigate; and is the Chief Scientific Officer for the Echocardiography Core Laboratory at the Cardiovascular Research Foundation for multiple industry-sponsored trials, for which she receives no direct industry compensation.

PCHD Council Steering Committee –

Welcomes Incoming Members

Every Scientific Session brings new learning, new accolades to great mentors and contributors in our field, and new committee members who bring in fresh ideas and perspectives.

EVERY SCIENTIFIC SESSION brings new learning, new accolades to great mentors and contributors in our field, and new committee members who bring in fresh ideas and perspectives. All this allows ASE to reinvigorate itself yearly with the contributions of these new members while building on the foundation and contributions of those who have gone before. We show our sincere gratitude to our Past Chair, Carolyn Altman, MD FACC, FAHA, FASE for her wisdom and leadership when serving the Pediatric and Congenital Heart Disease (PCHD) Council Steering Committee. We now welcome our new Chair, Craig Fleishman, MD, FASE. Thanks also to Seda Tierney, MD, FAAP, FASE, FACC, FAHA and Jennifer Hake, RDCS(PE/AE), RDMS(FE), FASE, who completed their terms as members at-large, providing content on behalf of the PCHD Council for *Echo* Magazine and contributing to the work of the Council Steering Committee. New appointments include Shubhika Srivastava, MD, FASE, who serves as the Education Committee Representative and Andrea Dragulescu, MD, PhD, FASE, who serves as the Guidelines and Standards Committee representative for the PCHD Council. Our sincere appreciation to Dallas Lyons who serves as our staff liaison and keeps us all on track and the Council work running on deadline. Our appreciation and recognition for all of the work by Luciana Young, MD, FAHA, FACC, FASE, who served as the PCHD Track Chair of the highly successful 2023 ASE Scientific Sessions and who partnered with Anitha Parthiban, MD, FASE (PCHD Track Co-Chair). Dr. Parthiban will now serve as the PCHD Track Chair for the 2024 ASE Scientific Sessions. Sharing in that work this year is Adam Dorfman, MD, FASE, who will be joining her as track co-chair. We would also like to extend a warm welcome to our new at-Large members, Daniel Forsha, MD, MCS, FASE, and Rebecca Klug, BA, ACS, RDCS (AE,PE), RT(R), FASE.

Dan Forsha, MD, MCS, FASE, is an associate professor and the Director of Imaging Research in the Children's Mercy Kansas City Heart Center in Kansas City, Missouri. His ASE involvement currently includes serving as the Co-Chair of the ASE Research Committee, Chair of the Pediatric Sub-Committee of the ASE ImageGuideEcho Registry, and he is a member of the JASE Advisory Editorial Board. He has also contributed to the upcoming Pediatric Transthoracic Echo Guideline and Adult Echo Standards papers. He was honored to be chosen for the second cohort of the ASE Leadership Academy (2020-2022) where he gained valuable leadership experience in addition to a strong bond to a rising group of future ASE leaders. Many of his favorite professional experiences have occurred at the ASE Scientific Sessions where he has presented on a variety of imaging topics and directed the Interactive Strain Learning Lab. He enjoys a mixture of clinical and research imaging pursuits with a focus on strain echocardiography and the impact of exercise on the single ventricle population. Recently, he was awarded the Single Ventricle Research Fund grant to team up with an applied physiologist and study the relationship between skeletal muscle, fitness, and cardiac function in the adolescent Fontan population. His time outside of work is family focused (wife and two teenage daughters), but he also finds time for some fitness and fantasy football hobbies. While he lives in Kansas City, he will forever be a Denver Broncos fan (even though that situation may currently be sad).

Rebecca Klug, BA, ACS, RDCS (AE,PE), RT(R), FASE, is the Assistant Supervisor at the Mayo Clinic Adult and Congenital Echocardiography Lab in Rochester, Minnesota. She has been involved with ASE since 2009 when she received the Alan D. Waggoner Student Sonographer Scholarship. From then, she became an ASE member and received FASE designation. Becky has participated and been active on numerous ASE committees such as the Education Committee, FASE Training and Certification Advisory Committee, and the CME Committee. Her passion is in training sonographers, students, and cardiology fellows in the echo assessment of congenital heart disease. She possesses the role of adjunct faculty within the Mayo School of Health Sciences, instructing the Congenital Echocardiography course. Becky makes education a priority, as evident in her longevity in the role as a clinical instructor as well as speaking at numerous Adult and Pediatric Echo Imaging conferences. She feels honored to have the opportunity to work daily with distinguished cardiologists and sonographers both at Mayo Clinic and among the ASE community. When off hours, Becky enjoys spending family time with her husband Jon, three children, Christian (11), Valerie (8), and Nolan (3), and their puppy Lilly.

We are fortunate to have such a dynamic and involved membership in the PCHD community. If you would like to get involved in the PCHD steering committee, there will be three At Large positions coming open this next year. As a PCHD representative, you would participate fully in the work of that respective committee, representing the interests of our community and reporting to the chair of the steering committee. Members at large participate in the steering committee meetings and work together to produce the monthly *Echo* magazine contributions on topics they choose that will be interesting and engaging for the membership.

Beyond these positions, there will be many opportunities for involvement on a number of committees. PCHD representation on these committees supports the profile and goals of our community and elevates our voice in all aspects of the ASE community and work while allowing volunteers to bring their own experience and insights into that work. The official call for volunteers opened November 1 and those openings are listed online.

Although not required, preference is shown to those with FASE designation, so if you have not yet applied for FASE, take that important step. There is a great article coming out about that just next month but click this link to get started.

Another way to contribute to our profession is to support the ASE Foundation. The Foundation supports initiatives such as training scholarships, global outreach, and scientific research that is not supported by membership dues. These projects are completely dependent on donations by our members, industry partners, and community health care providers. If Council Steering Committee involvement is not feasible for you at this time, please consider becoming an "ASEF Sustainer." By allowing a automatic charge to a credit card, monthly on the date of your choosing, you can support these important projects that benefit the entire community. Your donation can be in any amount and can be started and stopped at any time.

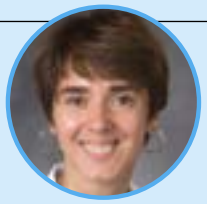
The Pediatric Steering Committee is looking forward to another highly productive year and we want to hear from you if there are issues to address or subjects that you would like to see highlighted in one of the monthly articles. We encourage you to get involved and help drive the interests of our community forward.

PCHD representation on these committees supports the profile and goals of our community and elevates our voice in all aspects of the ASE community and work while allowing volunteers to bring their own experience and insights into that work.

Accreditation for Perioperative Transesophageal Echocardiography is Here:

Time to Start Your Journey

*Contributed by **Alina Nicoara, MD, FASE**, Department of Anesthesiology, Duke University Medical Center, Durham, NC; **G. Burkhard Mackensen, MD, PhD, FASE**, Department of Anesthesiology and Pain Medicine, University of Washington Medical Center, Seattle, WA; and **Madhav Swaminathan, MD, MMCi, FASE**, Department of Anesthesiology, Duke University Medical Center, Durham, NC*



The primary objective of the IAC's echocardiography accreditation program is to ensure the delivery of superior patient care.

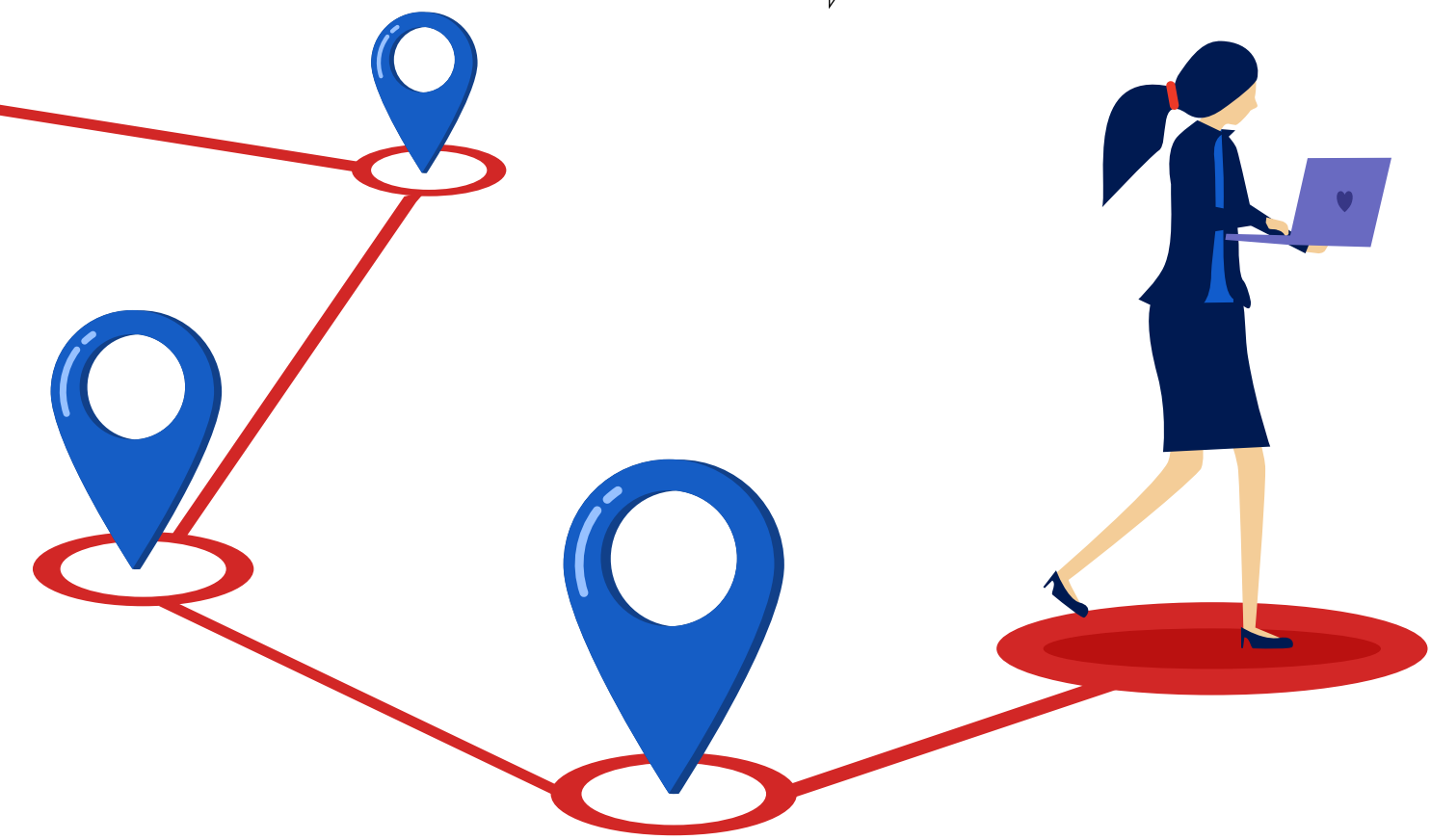
THE INTERSOCIETAL ACCREDITATION Commission (IAC), a nationally recognized nonprofit non-membership accrediting body, was established by physicians, technologists, sonographers, physicists, and other professionals across several medical specialties, to promote the appropriate use, standardization, and quality of diagnostic imaging and intervention-based procedures.

The IAC's journey in accrediting echocardiography laboratories began over two decades ago. The primary objective of the IAC's echocardiography accreditation program is to ensure the delivery of superior patient care. By championing enhanced healthcare and clinical outcomes, it provides a structured avenue to both encourage and recognize outstanding diagnostic evaluations. Engaging in the accreditation process enables facilities to meticulously assess every facet of their daily operations. Throughout the completion of the accreditation application, facilities frequently pinpoint and rectify latent issues, refine protocols, and affirm the effectiveness of their quality assurance initiatives.

Perioperative transesophageal echocardiography stands as a fundamental diagnostic and monitoring tool in managing patients undergoing a diverse range of cardiac surgical and transcatheter procedures. Often, these patients present with complex, rapidly evolving diseases, unstable conditions, and fluctuating hemodynamics. The success of surgical or transcatheter interventions heavily hinges on top-tier imaging quality.

The accreditation odyssey for perioperative echocardiography was pioneered by the visionary 2006 document on recommendations and guidelines for Continuous Quality Improvement (CQI) in perioperative echocardiography. Spearheaded by the ASE Council on Perioperative Echocardiography (COPE) in tandem with the Society of Cardiovascular Anesthesiologists (SCA), this groundbreaking document was the inaugural initiative to lay out the rationale for CQI.[1] It demarcated the components of a perioperative echocardiography service and underscored the CQI principles tailored to perioperative echocardiography practices. Over the years, the essence of CQI and accreditation in perioperative echocardiography have been consistently highlighted in the *Journal of the American Society of Echocardiography*. These publications underscored the necessity for standardized benchmarks in imaging and reporting.[2, 3]

This path represents a collaborative endeavor, uniting stakeholders and ushering in a transformative culture centered on continuous improvement of processes.



Fast forward to 2018, a formal alliance was forged between IAC, SCA, and ASE regarding perioperative echocardiography accreditation. This partnership saw the inclusion of representatives from ASE and SCA in the IAC Division of Echocardiography. Over the subsequent months, an assembly within the IAC Division of Echocardiography held consistent meetings and their collective efforts culminated in the creation of the IAC Standards and Guidelines for Perioperative Transesophageal Echocardiography. Following further in-depth discussions within the IAC and a public comment phase, four institutions—Duke University, Cleveland Clinic, University of Michigan, and University of Washington—were selected as pilot sites for accreditation applications. By February 2023, these pilot sites earned their accreditation, the IAC Standards and Guidelines for Perioperative Transesophageal Echocardiography were officially published,[4] and the doors of accreditation were opened to all perioperative echocardiography services prepared to embark on the process.

The process of securing accreditation in perioperative echocardiography aligns closely with that for other echocardiographic specialties. To begin, the application mandates comprehensive documentation, showcasing adherence to the stipulated standards. This includes details of policies, procedures, illustrative cases and reports, and additional corroborative evidence. Once the application is submitted, it comes under the scrutiny of a peer-review system managed by echocardiography specialists. This meticulous assessment ascertains that the facility either aligns with or surpasses the prescribed benchmarks. Depending on this evaluation's outcome, the IAC might grant the accreditation or, in cases where standards aren't fully met or if there are unresolved queries, solicit further details.

For institutions that already possess accreditation for adult or pediatric echocardiography laboratories, certain components of the IAC application might already exist, such as policy documents, business associate agreements, and quality improvement processes. These elements may simply need modification to fit the workflow of perioperative echocardiography. A trove of resources and assistance for crafting the application is readily available on the IAC website, and through direct outreach to IAC staff.

The ultimate focus remains unwavering: upholding high patient care standards.

While securing IAC accreditation is undeniably the end-goal of the application, the inherent value resides in the journey towards achieving it. This path represents a collaborative endeavor, uniting stakeholders and ushering in a transformative culture centered on continuous improvement of processes. The ultimate focus remains unwavering: upholding high patient care standards.

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IN MEMORIAM: Walter L. Henry, MD, FASE

Walter L. Henry, MD, FASE, was the 3rd President of ASE, serving from January 1981 through December 1982. Recently, we learned that Walter died on April 11, 2022. He was 81 years of age.

Contributed by **Alan S. Pearlman, MD, FASE**, Past-President, ASE, and JASE Editor-in-Chief, Emeritus, and **Julius M. Gardin, MD, MBA, FASE**, Past-President, ASE, and JASE Senior Consulting Editor

Walter Henry had a meteoric career. He was born and raised in Cumberland, MD, a small city located on the Potomac River in Western Maryland. Cumberland and Washington, DC border the same river, but Cumberland is closer to Pittsburgh than to our nation's capital. Hence, it seems fitting that Walter attended the University of Pittsburgh, where he majored in Electrical Engineering and graduated cum laude. He then entered the Stanford University School of Medicine, where – as a medical student – he wrote a computer program to quantify pressure data recorded in the cardiac cath lab.[1] While in the cath lab, he witnessed the first attempts to measure LV stroke volume using M-mode ultrasound, and he became fascinated by echocardiography. A friend recalls that while visiting Richard Popp's nascent echo lab, Walter was fascinated when he saw moving images of the heart walls and valves on an oscilloscope, and thought they were "a thing of beauty." Walter received his MD degree in June 1969, and was elected to Alpha Omega Alpha. After two years of training in Internal Medicine in the Albert Einstein College of Medicine program in New York City, Walter moved to the National Institutes of Health (NIH) in Bethesda in 1971, where he joined the Cardiology Branch at the National Heart and Lung Institute (now the

National Heart, Lung & Blood Institute) as a Clinical Associate. Asked "have you seen anything interesting recently?," Walter noted his strong interest in cardiac ultrasound. His supervisors were not equally enthusiastic, at least initially, but Walter followed his instincts and became the first physician at NIH to use echocardiography in both clinical investigations and patient care. In 1973, Walter became a Senior Investigator in the Cardiology Branch, remaining on staff until December 1978. Based on his strong record of accomplishments, Walter was actively recruited for academic positions in both New York City and Southern California. Ultimately, the opportunities offered by the University of California, Irvine (UCI) were the most attractive. In late 1978, Walter left the NIH and moved to UCI as a Professor of Medicine and Chief of the Division of Cardiology. Notably, it is very rare for one's first faculty position to be at the rank of Full Professor, with the responsibilities of a Division Chief! And especially noteworthy that Walter achieved these milestones before his 40th birthday!

Among other goals, UCI was eager to establish academic credibility, and Walter was the perfect fit. In addition to developing a productive and well-respected Division of Cardiology, Walter's administrative skills were quickly recognized, and he was asked to serve on numerous committees. He chaired the Cardiology Long Range Planning Task Force, the Credentials Committee, several Promotions Committees, and the College of Medicine's Risk Management Committee. He served as Vice-President of the Finance Committee, Vice-President of the Medical Staff Executive Committee, and President of the Medical Staff at the UCI Medical Center. In 1989, Walter was named Dean of the UCI College of Medicine, and Vice Chancellor of Health Sciences. He resigned from those positions in December 1993. He founded and was briefly involved with a company focused on intravascular coronary imaging, but in essence, he left the field of academic cardiology at the age of 52, more than 30 years ago.

Walter was active in the American College of Cardiology, the American Heart Association, the American Institute of Ultrasound in Medicine, and the ASE. Particularly noteworthy was his role as Chair of ASE's Committee on Nomenclature and Standards in Two-Dimensional (2D) Echocardiography. In 1980, this committee defined the standard 2D echocardiographic views that have been used for the past 40 years. One committee member recalls Walter's ability to consider various opinions carefully, and to settle controversy by incorporating two ways to orient an apical four chamber view (with the left ventricle on the right, as most preferred, or with the LV on the left, as a few wanted). The committee's report was one of the first ASE standards documents.[2] Walter's curriculum vitae lists an impressive series of original articles published in peer reviewed journals, review articles, and book chapters, as well as hundreds of lectures given over a 15-year period. In reviewing the materials that we were able to locate, two observations stood out. His first 8 publications were written while Walter was still a medical student, and he was first author on half of these! More striking than the number of articles published was the originality of the work, the quality of the articles, and the high impact journals in which they were published.

A friend recalls that while visiting Richard Popp's nascent echo lab, Walter was fascinated when he saw moving images of the heart walls and valves on an oscilloscope, and thought they were "a thing of beauty."

During his years in Bethesda, Walter made several major contributions to the relatively "new" field of echocardiography. Many of those ground-breaking contributions involved Walter's very fruitful collaboration with a young engineer, Jim Griffith, who happened to be working in the biomedical engineering group at the NIH. In the early 1970s, Walter and Jim visited Dr. Feigen-

NIH Echocardiology Development Team front row: Japanese visitor Ito, Walt Henry, Cora Burn, back row: Jim Griffith, Joyce Bryant MacKay, Estelle Cohen. Photo taken about 1974 in Bethesda Maryland.

baum's lab at Indiana University in Indianapolis, and spent some time with Sonia Chang, a cardiac sonographer who at the time performed most of the clinical echo studies at that facility. After studying the echo equipment and its clinical applications, Walter and Jim returned to Bethesda, where Jim built an M-mode echo unit that he linked to a fiberoptic strip chart recorder able to provide high resolution records of time-motion scans. Advanced for that era, this device facilitated recording of high quality, time-motion recordings that were suitable for quantitative analysis. In the early 1970s, a large group of patients with hypertrophic cardiomyopathy (HCM) were followed in the Cardiology Clinic at NIH, in part because the surgical myotomy-myectomy procedure for obstructive HCM had been developed by Andrew Glenn Morrow, MD, Chief of the Clinic of Surgery. Walter and his colleagues realized that by using M-mode echocardiography, they could document – and measure – thickening of the basal septum, which they found to be a dependable anatomic feature in patients with clinically apparent HCM.[3] They described a non-invasive approach to quantitating the subaortic gradient by measuring the duration and degree of mitral-septal contact.[4] They also noted increased septal thickness in asymptomatic relatives of patients with symptomatic HCM, suggesting a genetic basis for this disorder,[5] which previously had been considered to be "rare."

Walter realized that instead of slowly sweeping the echo transducer along the long and short axes of the left ventricle to create "M-mode scans," it might be possible to generate real-time tomographic images by moving the transducer. Jim Griffith built and perfected a transducer that "wobbled" a piezoelectric element back and forth on the chest wall, creating two-dimensional scans.[6] He also incorporated a potentiometer so that when the rate of transducer motion was affected by pressure on the chest during scanning, the rate of image display was altered accordingly. True to Walter's engineering background and his belief that making nice images was not sufficient and that quantitating the findings was a key step, he thought it important to validate the accuracy of 2D echo images. One approach to quantita-

tive assessment focused on patients with rheumatic mitral stenosis. Walter and his colleagues demonstrated that by scanning these patients carefully, one could image the stenotic valve orifice in cross-section, and trace its area by planimetry. To validate that approach, he studied patients with mitral stenosis who had been referred for valve surgery. Using a specially calibrated surgical device, Dr. Morrow and his surgical colleagues measured the stenotic valve orifice during mitral valve surgery, and their direct measurements confirmed the accuracy of the noninvasive images.[7]

Another early application of 2D echo involved the study of children with complex congenital heart disease. Walter realized that it should be possible to image the origins of the ascending aorta and main pulmonary artery, and to identify infants with abnormalities such as transposition of the great arteries and tetralogy of Fallot, for example. Walter tested this approach in healthy children, and also studied patients with known congenital heart disease with the assistance of his good friend, David Sahn, MD, FASE.[8] Finding children with carefully documented complex congenital heart disease was challenging, so Walter also took advantage of the opportunity to scan some explanted, formaldehyde-fixed heart specimens with classic congenital lesions that were part of an extensive collection at the Armed Forces Institute of Pathology. Working with Leon Schlossberg, a gifted medical illustrator and a professor at Johns Hopkins University, Walter compared images taken using his sector scanner with Schlossberg's professional illustrations as a clever way to validate the accuracy of the 2D echo images.

Walter and Jim Griffith also developed instrumentation that allowed both echocardiographic imaging and Doppler blood flow measurement. This ultimately led to early studies at UC Irvine (using commercial equipment) in which Julius Gardin, MD, working with Dr. Henry, used pulsed Doppler techniques to study intracardiac blood flow behavior in a series of nearly three dozen studies, published during the decade 1983-1993. In addition, Dr. Henry was instrumental in assisting Dr. Gardin to establish an NHLBI-funded core echocardiography laboratory that played an important role in multicenter NIH-funded epidemiologic studies of the elderly (CHS) and young adults (CARDIA). Walter also worked with Jonathan M. Tobis, MD (who became a well-known interventional cardiologist) and Orhan Nalcioglu, PhD to advance the fields of digital subtraction angiography and intravascular ultrasound imaging. Walter also assisted Uri Elkayam, MD (who became an expert in pregnancy-related heart disease) on important studies related to heart failure.[9] In addition, Walter helped to mentor Dr. Ali Dabestani and a cadre of gifted Japanese investigators, including Drs. Katsu Takenaka and Toshinori Utsunomiya.[10]

During his term as ASE's third President, Walter made efforts to move the ASE into the digital world. Estelle Cohen, RN, who had moved from NIH to UC Irvine with Walter, used a very early computer system to organize ASE records and correspondence. Personal computers were rudimentary and not yet in vogue in 1981-1982, but Walter had already written computer programs in the late 1960s, while a Stanford medical student, and he wisely recognized that digital records would be important in the future.

His colleagues remember Walter as a bright, energetic, imaginative man who enjoyed a good laugh and cherished the finer things in life. Several colleagues have reminded us of his love of fine dining and his familiarity and friendship with Alice Waters at Chez Panisse in Berkeley, who helped to popularize the "farm to table" approach to cuisine. Walter is reported to have said that "he remembered where and what he ate but could not recall who he was with." He also enjoyed interesting automobiles; while he was at the NIH, he drove a Triumph TR-4 convertible, and after moving to Southern California, he upgraded to a chocolate-colored Mercedes sedan. He and his longtime friend David Sahn were irreverent, but they made a powerful team when it came to imaging and documenting novel applications of ultrasound technology, and in advocating effectively for the clinical value of cardiac ultrasound. Walter was also a patron of the arts. While at the NIH, he was fond of attending performances at what is now called the Wolf Trap National Park for the Performing Arts, in northern Virginia. In California, he enjoyed attending live performances of Luciano Pavarotti, and was equally comfortable discussing punk rock. Whether

Walter's career reminds us that if one is bright, focused, and committed to designing and executing imaginative, clinically important work, one can indeed accomplish a great deal in a relatively short period of time.

dressed in a tuxedo or in jeans, he enjoyed spending time conversing with friends. After moving to Southern California, he became quite involved in the very active Arts scene in Orange County, CA where he lived. His wife, Maria del Carmen Calvo, was a gifted and accomplished artist who passed away several years before Walter's death. As one of his friends reminded us, Walter saw something new every time he opened his eyes, whether that involved looking at images of the heart or staring at the Pacific Ocean.

Walter Henry's brief but very productive career in echocardiography illustrates the value of a winning "game plan." We'll paraphrase Jim Griffith's nice summary: Before starting on a project, Walter carefully considered the importance of the proposed idea if the project were accomplished. He focused not just on initiating worthy projects, but on completing them. And he placed high value on interdisciplinary work and collaborative efforts; his collaborations with nurse-sonographers Cora Burn, Joyce Bryant MacKay, and Estelle Cohen were central to the quality of his studies. ***Figure 1***, which was taken almost 50 years ago, shows a group of professionals who clearly enjoyed working together. In this photo, it is fitting that Walter is surrounded by his three very skilled nurse-sonographers, and sharing his expertise with a visiting scientist. Equally important, although Jim Griffith might appear to be hiding in the background, he was never far away. Walter's career reminds us that if one is bright, focused, and committed to designing and executing imaginative, clinically important work, one can indeed accomplish a great deal in a relatively short period of time.

The authors of this In Memoriam article were fortunate to have worked with Dr. Henry at the NIH (ASP 1972-75; JMG 1976-77) and at UC Irvine (JMG, 1979-93), and we both learned a great deal from him. He was a unique individual in many ways, and we cherish his memory. The authors would like to thank several of Walter's good friends who generously contributed some of their own recollections, for which we are grateful. These include (listed alphabetically) Cora R. Burn, RN, Anthony N. DeMaria, MD, FASE, James M. Griffith, PhD, Joseph Kisslo, MD, FASE, Cynthia G. McDaniel, and Richard L. Popp, MD, FASE.

Readers interested in "seeing and hearing" Dr. Henry will enjoy his video interview, conducted in 2009 by Dr. Randy Martin, which can be accessed on YouTube.

This text also appears in the November JASE. OnlineJASE.com

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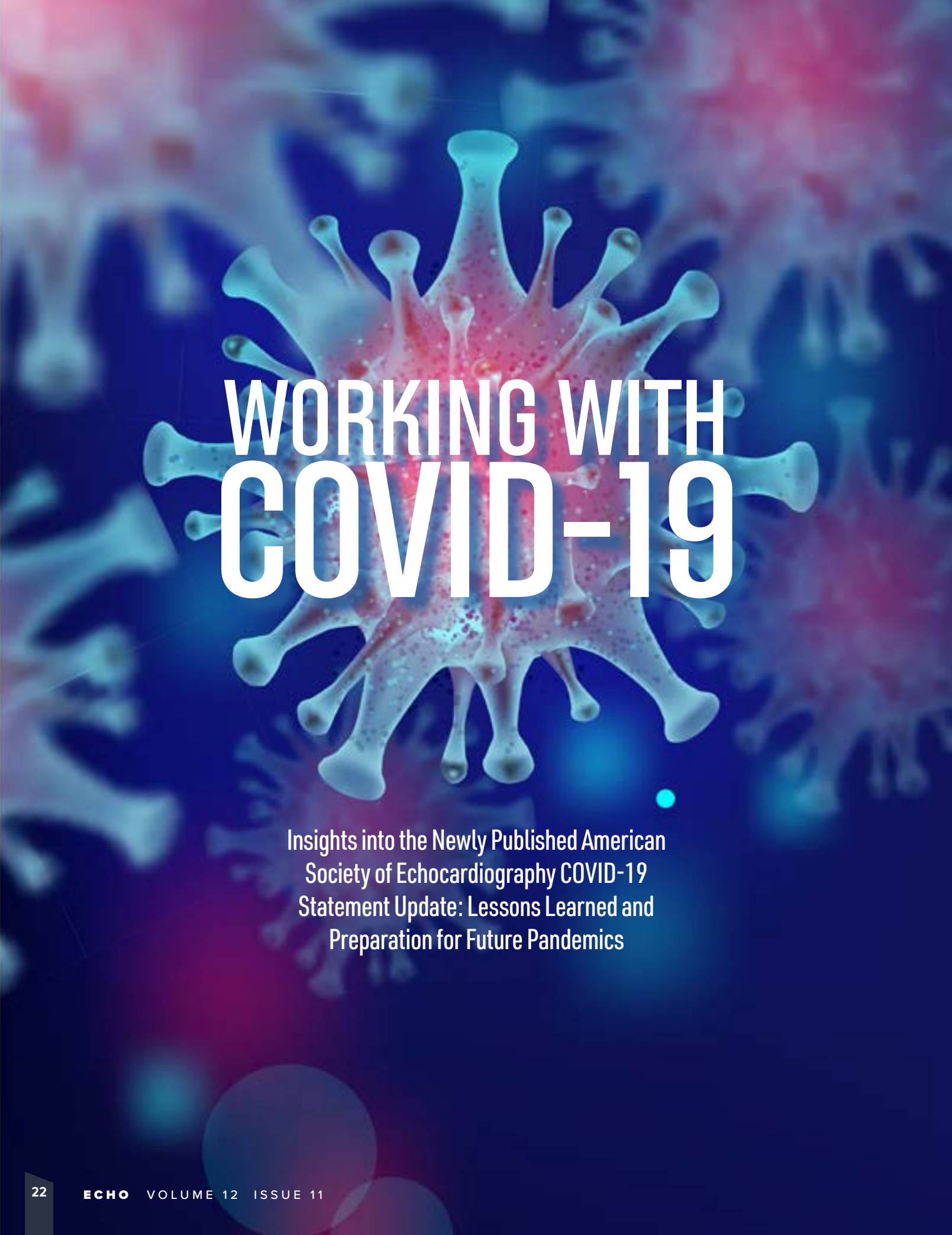
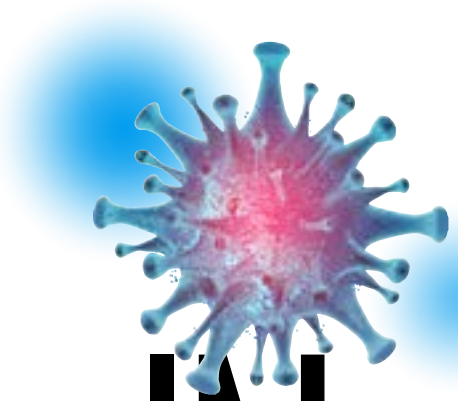


WORKING WITH COVID-19

Insights into the Newly Published American Society of Echocardiography COVID-19 Statement Update: Lessons Learned and Preparation for Future Pandemics



IN 2020, ASE published a statement guiding echocardiography laboratories in best practice during the COVID-19 pandemic.

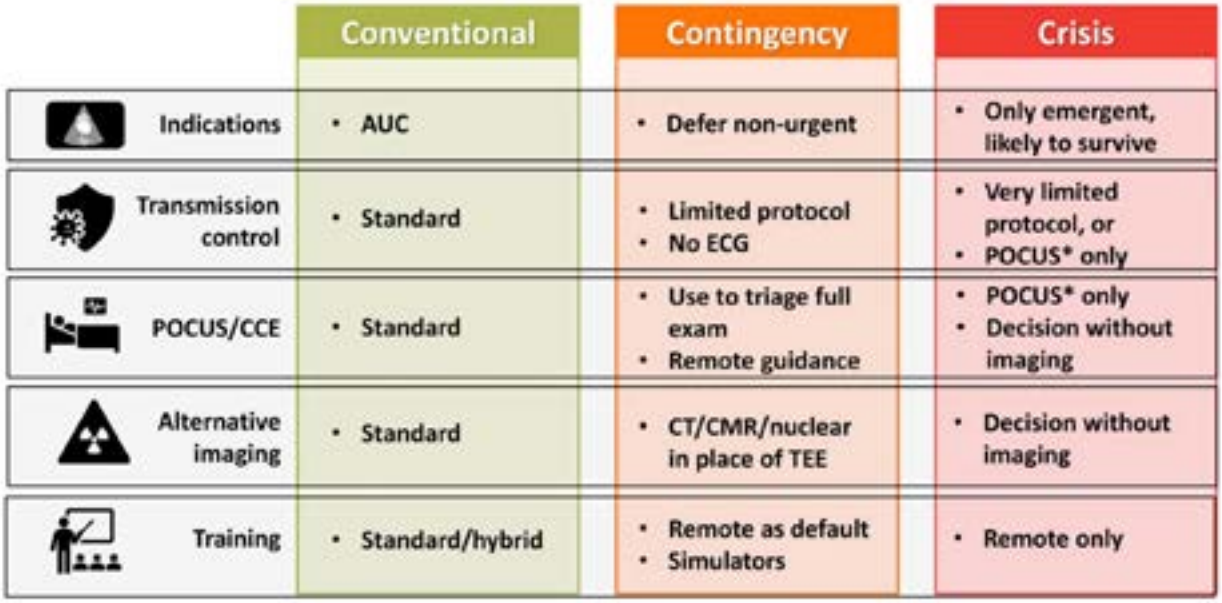
Since this publication and additional statements focused on specific patient populations (pediatric, perioperative), the pandemic has evolved and so have our tools protecting and treating COVID-19 infection. ASE convened an expert writing group to address the current state of the COVID-19 pandemic and advise echocardiography laboratories on operation during future pandemics.

The ASE COVID-19 Statement Update: Lessons Learned and Preparation for Future Pandemics covers the following important areas: indications for echocardiography, application of echocardiographic services in a pandemic, transmission and mitigation strategies, role of cardiac POCUS/critical care echocardiography (CCE), unique/alternative imaging modalities, and training in echocardiography.

When recommending for preparedness for future pandemics, the writing group followed a disaster-response planning model: conventional, contingency, and crisis standards of care and preparedness. Conventional care standards are the high standards of performance when resources are not limited. Contingency care standards anticipate shortages and find ways to conserve resources or to substitute with alternative techniques, without compromising usual standards. In crisis standards resources are insufficient to maintain usual standards of care and, in many instances, necessitate deferring or canceling nonurgent studies.

Contributed by
Smadar Kort, MD, FASE,
Professor of Medicine, Director, Non-Invasive Cardiovascular Imaging, Director, Echocardiography, Co-Director, Valve Center Director, Structural Heart Imaging Program, Renaissance School of Medicine at Stony Brook University, Stony Brook, NY

Most of the guidance in this statement applies to contingency standards of care.



Central Illustration Practice applications in pandemic standards of care. AUC, Appropriate Use Criteria; ECG, Electrocardiogram; POCUS, Point of Care Ultrasound; CCE, Critical Care Echocardiography; CT, Computed Tomography; CMR, Cardiac Magnetic Resonance Imaging; TEE, Transesophageal Echocardiogram. (This Central Illustration is from the American Society of Echocardiography COVID-19 Statement Update: Lessons Learned and Preparation for Future Pandemics, Published in the November 2023 *Journal of the American Society of Echocardiography.* Reprinted with permission from Elsevier Inc.)

It is important to keep in mind that while this document refers to the COVID-19 pandemic with respect to disease-specific management, the recommendations made may be broadly applicable in any future pandemic.

INDICATIONS FOR ECHOCARDIOGRAPHY

Indications for echocardiography during a pandemic are based on the expected manifestations of the infection and the expected echocardiographic findings.

Echocardiographic Findings in Acute COVID-19 Infection

One of the most common indications for echocardiography in patients with COVID-19 infection is suspected left-sided heart failure, and the test is used to determine the presence, the severity and potential causes of left ventricular (LV) systolic dysfunction including acute coronary syndrome, stress (takotsubo) cardiomyopathy, myocarditis, and multisystem inflammatory syndrome. LV diastolic dysfunction has also been found in patients with acute COVID-19 infection, however, the exact incidence and the mechanism for development of isolated diastolic dysfunction is unknown.

At least as common as the incidence of LV dysfunction in acute COVID-19 is the incidence of right ventricular (RV) dilation and dysfunction. The potential mechanisms include any potential cause of LV dysfunction as well as acute pulmonary hypertension or acute cor pulmonale caused by acute respiratory distress syndrome, pneumonia, or pulmonary thromboembolism. Echocardiography is the noninvasive test of choice to determine the severity and possible etiology of pulmonary hypertension. Pericardial effusions leading to tamponade can be seen, although uncommon.

Echocardiographic Findings in Postvaccine Myocarditis

Myocarditis and pericarditis occur rarely following administration of COVID-19 mRNA vaccines. Echocardiographic findings in myocarditis include reduced or normal ejection fraction, increased wall thickness, mild regional wall motion abnormalities, diastolic dysfunction, RV systolic dysfunction, pericardial effusion, and abnormal LV global longitudinal strain (GLS).

Echocardiographic Findings in Long COVID Syndromes

"Long COVID" is defined as symptoms persisting ≥4 weeks after acute infection, and "post-COVID syndrome" for symptoms persisting for ≥12 weeks. Longitudinal echocardiographic studies show discrepant results, and further research is needed to determine the reversible nature of any identified LV dysfunction.

APPLICATION OF ECHOCARDIOGRAPHY SERVICES IN A PANDEMIC

Decisions about performance of studies should incorporate benefit and risk for the patient, as well as risk for the staff, within the context of conventional, contingency, or crisis standards of care. Although there are no appropriate use criteria specific for COVID-19, criteria can be extrapolated. The complexity and potential risk associated with specific tests (aerosolizing TEE and exercise stress echocardiography vs. nonaerosolizing TTE and dobutamine stress echocardiogram) as well as the local prevalence of infection should be considered. In crisis standards of care, it may be necessary to consider the trajectory of the patient. Each facility should develop screening and triaging protocols that should be reassessed and modified as the prevalence of COVID-19 in the community changes. The patient's COVID status should not be a reason to deny an appropriate test or affect timeliness benchmarks.

INFECTION/TRANSMISSION MITIGATION STRATEGIES

Personal Protective Equipment

The level of personal protective equipment (PPE) depends on the COVID-19 risk as well as institutional policy and resources. Standard care requires hand washing, use of gloves, and possible use of surgical face mask. Droplet precautions require gown, gloves, head cover, face mask, and eye shield. Airborne precautions required during TEE requires N-95 or N-99 respirator masks, powered air-purifying respirator systems, and possibly shoe covers, because of the increased risk for aerosolization. During TTE, symptomatic patients and the scanning sonographers should wear masks.

Recommendations for Avoiding Pathogen Transmission During Echocardiography

1.	For inpatients, examination should be performed at the bedside, and for outpatients, a dedicated room should be used to avoid crossover with more vulnerable patients.
2.	PPE as dictated by local protocols is required.
3.	Physical barriers between sonographer and patient may be advised.
4.	Handheld devices may further mitigate infection risk due to their smaller size, making them easier to clean.
5.	Echocardiographers should take steps to minimize patient contact time, which may include importing the ECG from the patient's telemetry system when possible or using time-based acquisitions.
6.	It is advisable to perform a limited study with images specifically targeted at answering the clinical question and for de novo cases, addressing the most common expected findings.
7.	Offline measurement analysis is encouraged in this setting to further reduce patient contact time.
8.	To save time, UEAs should be prepared and brought into the room if there is an anticipated need.
9.	Appropriate postprocedural disinfection of equipment is required.

(Table 2 from the American Society of Echocardiography COVID-19 Statement Update: Lessons Learned and Preparation for Future Pandemics, Published in the November 2023 *Journal of the American Society of Echocardiography*. Reprinted with permission from Elsevier Inc.)

Vaccines

Vaccination is one of the most effective countermeasures for mitigating a pandemic. Decisions about mandating vaccines and reassigning staff with religious or medical exemptions to vaccination depend on institutional policies.

Limited, Focused Studies

To reduce exposure time and therefore transmission, it is advisable to perform a limited study with images specifically targeted at answering the clinical question. Importing the ECG from the patient's telemetry system where possible or using time-based acquisitions may reduce contact. When a comprehensive study is required, offline analysis is recommended. Ultrasound enhancing agents should be considered and be made readily available for use in portable echos.

Unique/Alternative Imaging Modalities

The risk of aerosol generation during TEE and deep breathing or coughing during exercise stress echocardiography have led to an increase in alternative imaging modalities that could provide similar diagnostic information. However, in some situations the benefits of TEE or stress echocardiography may outweigh the risks.

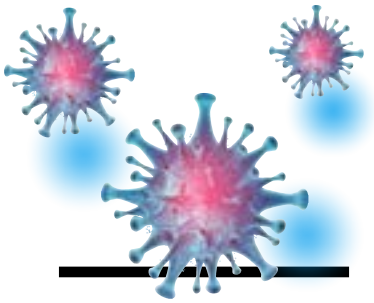
POINT-OF-CARE ULTRASOUND AND CRITICAL CARE ECHOCARDIOGRAPHY

POCUS can be used to guide the need for further imaging and to allow for more focused TTE. If a full TTE is indicated, requiring POCUS prior to it may add unnecessary exposure and may delay care. However, in crisis or severe contingency standard situations, POCUS/CCE may be the only modality available. Ideally, they should be formally interpreted, documented, and archived. Barriers for implementing a POCUS/CCE program should be addressed ahead of future pandemics.

TRAINING IN ECHOCARDIOGRAPHY

Scanning

Considering the risk of future pandemics, sonography schools and clinician training programs should explore hybrid learning models, which involve a mix of in-person, simulator-based, and online instruction. Asynchronous online instruction and simulators are crucial in crisis standards of care. An alternative approach is extending the time to acquire the requisite number of cases.



Considering the risk of future pandemics, sonography schools and clinician training programs should explore hybrid learning models, which involve a mix of in-person, simulator-based, and online instruction.

Interpretation

Remote learning platforms can provide wider accessibility and flexibility for trainees. Technology allows interactivity and reliable use of instructional tools to engage learners. Recording of sessions allows for creating content repositories. The efficacy of remote learning is similar to in person instruction, provided a comprehensive and structured approach is followed.

A blended method is likely the optimal approach, therefore adopting the technology and protocols to allow remote learning is recommended.

CONCLUSION

This statement addresses echocardiography practice in current and future pandemics. Specific indications and decisions about the performance of echocardiography services, infection/transmission mitigation strategies, the role of cardiac POCUS/CCE, unique/alternative imaging modalities, and training in echocardiography remain key areas for planning and preparation.

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.