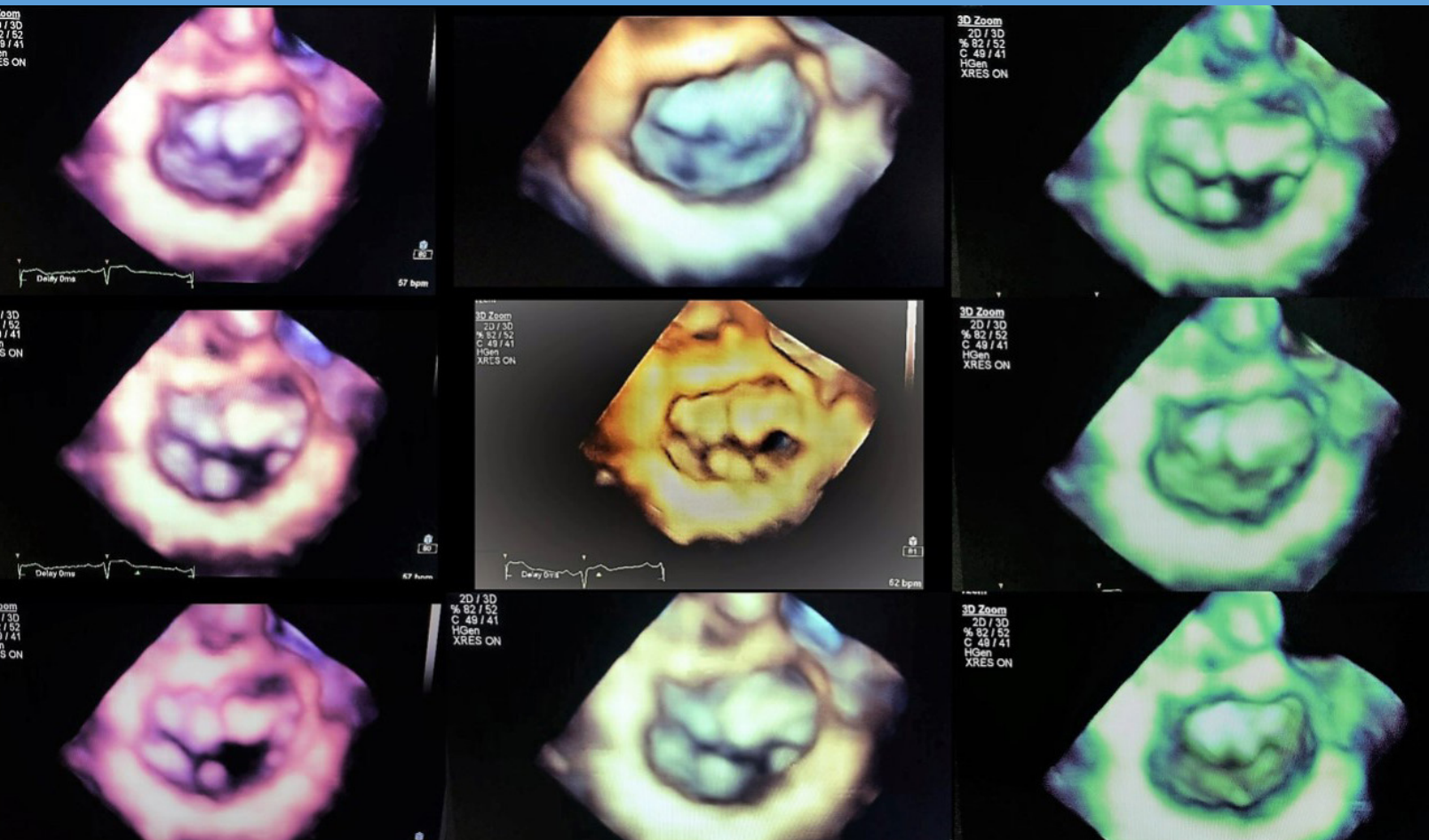


ECHO



20

***Honoring a True Echo
Pioneer and Mentor:
ASE's 6th President
David J. Sahn, MD, FASE***

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***Esther Kim, MD, FASE,
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Dr. Vivien Thomas and Shares
Opportunities to Show Your Heart***

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2022 EDUCATION CALENDAR

FEBRUARY

34th Annual State-of-the-Art Echocardiography: Virtual Experience

Content available February 19, 2022 to May 20, 2022.

Registration closes March 6, 2022.

Jointly provided by ASE and the ASE Foundation

MARCH

Advanced Echo: Echo Access Virtual Experience

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

Content available March 21, 2022 with access until March 21, 2023.

Jointly provided by ASE and the ASE Foundation

MAY

23rd Annual ASCeXAM/ReASCE Review Course | VIRTUAL

Content Available May 2022

Jointly provided by ASE and the ASE Foundation

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

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

JUNE

33rd Annual Scientific Sessions

June 10-13, 2022

Seattle, WA

Jointly provided by ASE and the ASE Foundation

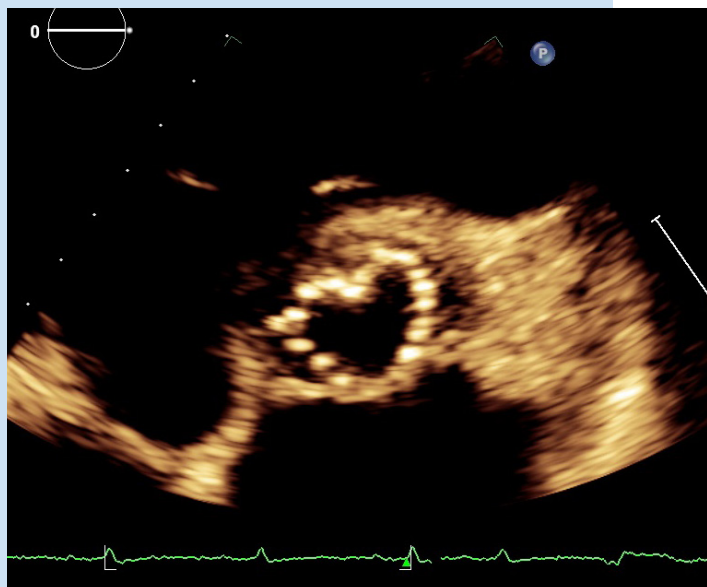
OCTOBER

10th Annual Echo Florida

October 8-10, 2022

Walt Disney World®, Florida

Jointly provided by ASE and the ASE Foundation



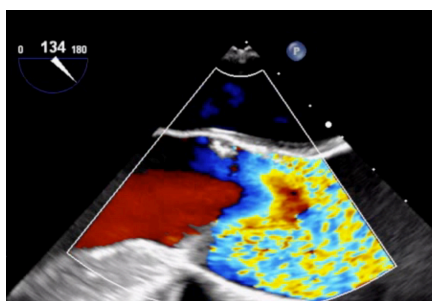
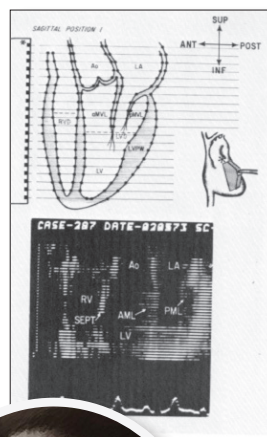
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2530 Meridian Parkway, Suite 450
Durham, NC 27713

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Cover art: "Scallops Revolution" — 3D-TTE
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Jason Ballo, RN, RDCS, RCS, Royal
Brompton Hospital, London, England,
United Kingdom

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.

IMPROVING HEART HEALTH THROUGH RESEARCH

Contributed by **Raymond Stainback, MD, FASE**, Chief of Non-invasive Cardiology at the Texas Heart Institute at Baylor St. Luke's Medical Center in Houston, Texas and associate professor of Medicine at Baylor College of Medicine.

The ASE's mission is to improve lives through the application of cardiovascular ultrasound imaging in its many forms. An instrumental way to do this is to explore knowledge gaps through research activities. February is Heart Month, an ideal time to reflect upon ASE's ongoing research efforts dedicated towards the diagnosis and treatment of cardiovascular disease.

The table, below, shows the diverse inventory of research-related projects developed within the ASE's ecosystem of committees, work groups, and the ASE Foundation – not just the Research Committee! This impressive list may not be apparent even to leaders within ASE due to rapid developments. As you can see, our ASE environment has proven to be a fertile ground for an entrepreneurial style of research development along many avenues. Within our existing structure, creativity happens because there are few limits placed on what we would like to achieve. However, the “magic” requires an organizational framework for scientific oversight and financial support. I am happy to report that in early December we conducted the first brainstorming meeting by our new research oversight work group headed by Dr. Sam Siu.

Included in the group are key ASE stakeholders

from diverse clinical backgrounds and a variety of areas within the Society including our Research Committee, JASE, the ASE Foundation, ImageGuideEcho Registry Committee, ASE Board, and the IRT Committee. We discussed ways to enhance the growth of ASE Research, coordinate activities, and how to improve the visibility of our many exciting projects both internally within the ASE family and to the outside world.

Let's take a look at some of our ongoing research. In 2021, we had progress in many areas (see table). One of the most prolific has been from our World Alliance Societies of Echocardiography (WASE) studies. To date, 10 original research manuscripts coming from this international collaborative group have been published in JASE. This series redefines the understanding of normative values for cardiac chambers in the adult population internationally. In addition, the WASE COVID study has completed its data gathering and has resulted to date in two publications that help understand the acute and mid-term cardiac consequences of COVID infection. Our PIs, Roberto Lang, MD, FASE, and Federico Asch, MD, FASE, lead a group of international WASE investigators in finalizing additional reports.

The ASE E21 Research Grant program, which funded partnerships between early career physician-scientists and engineers to tackle clinical gaps, is just now

RESEARCH PROJECT INVENTORY

| External – ASE as Facilitatory of Research | Status |
|--|--|
| WASE Normal Values | Completed – Additional Publications Pending |
| WASE COVID | Completed - Additional Publications Pending |
| E21s | Completed – Additional Projects Desired |
| Pam Douglas Research Scholar Award | In Progress – Bi-Annual Award |
| Innovation in CV Ultrasound Awards (2) | Awards given in 2021. Research studies underway. |
| Valvular Heart Disease Grant | In Progress – RFA opens late February 2022. |
| Hackathon – IEEE Partnership, Critical Care Monitoring | In Progress – June 2022 Debut |
| NAVREF Research & Education Partnership | Initial Connection Made |
| NIH NHLBI Project | In Progress |

wrapping up. The bold endeavors funded by the E21 awards will help shape the future for advanced diagnostic and therapeutic uses of ultrasound in cardiovascular medicine. The 2022 Annual Scientific Sessions in Seattle will highlight the results of these research programs.

Yasufami Nagata, MD, PhD, from the Massachusetts General Hospital, is our first Pamela S. Douglas Research Scholar fellow. Established by the ASE Foundation to support impactful clinical or translational research in advanced cardiovascular imaging, Dr. Nagata's research is entitled "Seeking Treatable Promotors of Ischemic Mitral Regurgitation: Using Advanced Echocardiographic Techniques to Discover Molecular and Cellular Factors." We look forward to hearing about his progress in June in Seattle as well.

Research is often at the forefront of the field, and it increases the velocity of innovation. Our two Innovation Awards in Cardiovascular Imaging, sponsored by the ASE Foundation, were created to fund projects that expand the key role of echocardiography, or the development of novel technology in clinical diagnosis or management. Two early career winners were selected by our ASE Research Committee: Olivier Villemain, MD, PhD, from The Hospital for Sick Children at the University of Toronto, and Bethel Woldu, MD, MPH, from Medstar Heart and Vascular Institute. Dr. Villemain's project, "Myocardial Stiffness and Coronary Micro-perfusion Assessment for Early Detection of Cardiac Allograft Vasculopathy in Children after Cardiac Transplantation: Human Application of Ultrafast Ultrasound Imaging," seeks to revolutionize the treatment of children after cardiac transplantation. Dr. Woldu's research is entitled "Non-Invasive Assessment of Myocardial Work to Differentiate TTR Cardiac Amyloidosis from Hypertensive Cardiomyopathy," and especially seeks to close the gap in adverse cardiac outcomes and reduce healthcare disparities among at-risk populations in the greater Washington, DC - Baltimore area.

In 2022, ASE will also be writing an extensive request for application (RFA) for projects related to practice patterns for the echocardiographic diagnosis and reporting of aortic stenosis, a project generously supported by Edwards Lifesciences.

This June, onsite at our annual Scientific Sessions, an exciting Hackathon project, chaired by Dr. Carol Mitchell, will unfold. In 2021, the ASE developed a partnership with the very large Institute of Electrical and Electronics Engineers – Ultrasonics, Ferroelectrics and Frequency Control Society (IEEE UFFC-S) to create five teams, with each team consisting of two PhD-level academic researcher members from UFFC-S and one ASE-assigned domain expert critical care clinician. The

five teams will compete to develop a novel method using ultrasound for the continuous monitoring of critical care patients. ASE-assigned clinicians include critical care pediatric, critical care cardiovascular anesthesia, pulmonary critical care, and adult cardiovascular specialists. The team meetings are under way in preparation for this upcoming June event!

We are also focused on expanding external collaborations, and two such projects are underway. The first, spearheaded by ASE's Board member, Vandana Sachdev, MD, FASE, is a potential public private partnership in heart failure research through the National Institutes of Health (NIH) and the Foundation for NIH. The other is focused on helping Veteran's Administration hospitals to be involved in cardiovascular imaging research through a partnership with the National Association of Veterans' Research and Education Foundations (NAVREF).

Internally, the ASE's ImageGuideEcho Registry is thriving, with over 320,000 exam reports in place with image uploads coming next. The Registry is considering many projects, specifically focusing on the acceleration of DICOM images within the registry interface – an activity prioritized by our ASE Board of Directors. The registry will ultimately house a vast quantity of real-world echo exam data, and this resource for investigators has the potential for providing important discoveries.

Our dedication to these projects and all forms of cardiovascular ultrasound-related research has the potential to change the landscape of cardiovascular disease diagnosis and management. We invite you to give us your feedback not only on how we are doing but also on how to involve more ASE members in these diverse and impactful efforts of cardiovascular research.

Raymond Stainback, MD, FASE
ASE President



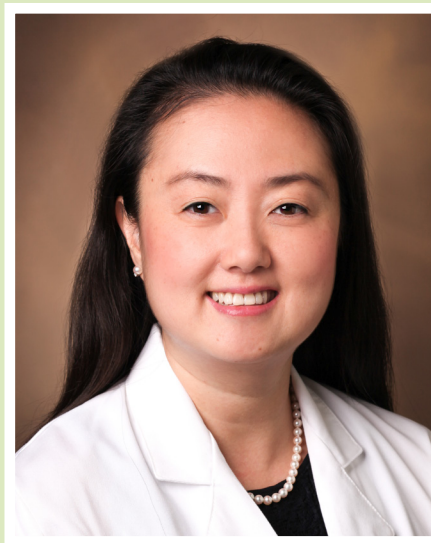
Esther Kim, MD, FASE, Receives Inaugural CAVUS Luminary Award

Contributed by:

**Bryan J. Wells, MD,
FASE, FACC, FSVM,**
Emory Healthcare,
Atlanta, GA, Council
on Circulation &
Vascular Ultrasound
Chair



AT THE ASE 2022 Scientific Sessions in June, Esther Kim, MD, FASE, will receive the first ever Circulation and Vascular Ultrasound (CAVUS) Council Luminary Award. Dr. Kim completed her undergraduate and medical school education at Duke. She then completed residency at Johns Hopkins and cardiology and vascular medicine fellowships at the Cleveland Clinic. She remained on faculty at Cleveland Clinic and is now Associate Professor of Medicine at Vanderbilt. At Vanderbilt, she is the director of the arteriopathy service and the diagnostic vascular laboratory. She leads the national registry for spontaneous coronary dissection (iSCAD), and is the site primary investigator for the national fibromuscular dysplasia registry. Most impressive, is the robust number of publications and national presentations that Dr. Kim has contributed relatively early in her career. Similarly, her service at the national level is exemplary, with a long list of committees and leadership positions in ASE, the Society for Vascular Medicine, American College of Cardiology, and the American Heart Association. In the area of cardiovascular ultrasound, Dr. Kim



recently published a guideline document on vascular waveforms that will standardize reporting in vascular labs across the world. She was also an author on the recent ASE carotid plaque guideline document. She frequently gives lectures on vascular imaging, including board review courses and cutting-edge

science. She is also an editor for multiple journals in the area of vascular imaging and medicine. Dr. Kim was recently interviewed about her career and the CAVUS Luminary Award.

Q: What does the ASE CAVUS Luminary Award mean to you?

A: This one is so hard! I am so honored to be the inaugural ASE CAVUS Luminary Award recipient. The award is made even more special because the nomination came from my fellow colleagues, who are themselves leaders in the field of vascular imaging. ASE has been pivotal in my career development since I joined in 2010. I have served on multiple committees and was privileged to be a part of the Board of Directors from 2015-2017. Those experiences have taught me leadership skills that have been invaluable in multiple areas of my career. To be recognized with this award from ASE now is beyond humbling. Thank you.

Q: What inspired you to pursue cardiology as a career?

A: Cardiology was the perfect intersection of thinking and doing. It is cerebral and procedural and that was very appealing to me as a medical resident. I also appreciated the ability to become facile at reviewing multiple imaging modalities in the care of the cardiac patient.

Q: What do you enjoy about the field of vascular medicine and vascular imaging?

A: The heart cannot function in isolation, and I think we are just now learning about the complex interplay between the heart and the vasculature. Vascular medicine allows me to call myself a true “Cardio Vascular” medicine specialist as the additional training in all blood vessels outside the heart allows for the complete care of the cardiovascular patient. My current interest in spontaneous coronary artery dissection (SCAD) is the perfect example as patients (primarily women) present with myocardial infarction, but frequently have vascular findings such as fibromuscular dysplasia, aneurysm, or dissection that need treatment as well. My additional training in vascular medicine has allowed me to provide comprehensive care for these patients, simultaneously treating their residual chest pain or heart failure while also monitoring or referring for their vascular abnormalities. Vascular imaging is just fun! There are a variety of tests, so reading is never monotonous, and the field of vascular imaging has been advanced by physicians and sonographers in so many different specialties (vascular surgery, radiology, cardiology) that I have colleagues all over the world I can call friends. It’s truly a gift to be able to see a patient with something common like leg swelling and be able to read the echo, read the venous duplex, manage the anticoagulation for deep vein thrombosis (DVT) or medications for heart failure, or make the diagnosis of lymphedema or lipedema and treat accordingly.

Q: Who are your career mentors and why?

A: My career mentors include Dr. Michael Lauer who is the current Deputy Director for Extramural Research at the National Institutes of Health. He was my research mentor when I was a cardiology fellow at the Cleveland Clinic, and I will never forget his advice that if the reviewer of your manuscript just “doesn’t get it,” rewrite it so they get it! He made the time at short intervals to make sure I was on the right track, and I have learned so much from him. My mentor in vascular medicine and vascular imaging is Dr. Heather Gornik, who is currently the Co-Director of the Vascular Center at University Hospitals, Harrington Heart and Vascular Institute in Cleveland. She taught me a love of clinical medicine, vascular ultrasound, and caring for patients with rare disease. It has been the greatest blessing to have Dr. Gornik’s mentorship through my career, and the only way to truly pay her back is to be that kind of mentor to someone else.

Q: What advice would you give to women in cardiology?

A: I would tell women in cardiovascular medicine that you may not be able to do everything at the same time, but you can do most things eventually. Everything has a time and a season, and for me, the season to be a good mother to my boys is just as important as the season to be a national leader in vascular medicine. Cardiovascular medicine is a demanding specialty, but if you have vision and a good plan, cardiovascular medicine can be so fulfilling. I would tell them to be ambitious, seek out good mentors, and persevere.

The CAVUS council is thrilled to recognize Dr. Kim for this prestigious recognition. She is an absolute superstar, and a quintessential colleague who continues to contribute to ASE.

Cardiovascular medicine is a demanding specialty, but if you have vision and a good plan, cardiovascular medicine can be so fulfilling.

During Congenital Heart Disease Awareness and Black History Month, PCHD Honors Dr. Vivien Thomas and Shares Opportunities to Show Your Heart

Contributed by: Members at Large on behalf of the ASE Pediatric and Congenital Heart Disease Steering Committee: **Bhawna Arya, MD, FASE; Pei-Ni Jone, MD, FASE; Neha Soni-Patel, MEd, BSME, RCCS, RDCS (AE/PE), FASE; Seda Tierney, MD, FASE; and Jennifer Tresness, RDCS(PE/AE), RDMS(FE), FASE**



THE ASE PEDIATRIC and Congenital Heart Disease Steering Committee would like to recognize three very important celebrations occurring in February: Black History Month, American Heart Month, and Congenital Heart Defect Awareness Week.

Black History Month is an opportunity to acknowledge and honor the innumerable contributions and sacrifices made by African Americans throughout our history. Advancements in pediatric cardiology resulting from efforts such as these, are of special interest. American Heart Month is a reminder to prioritize heart health for everyone, particularly vital for our congenital heart disease patients. Our hope is that you find inspiration this February to honor these observations with action, seeking new ways to serve. Allow this month to be an invitation to open your heart to the many opportunities to contribute to our cardiology profession or to our worldwide community.

In 1976, President Gerald R. Ford encouraged Americans to “seize the opportunity to honor the too-often neglected accomplishments of black Americans in every area of endeavor throughout our history.” We would like to honor this commemoration of Black History by sharing the story of a substantial

contributor to our field, Dr. Vivien Thomas.

Dr. Vivien Thomas worked as a laboratory assistant to Alfred Blalock in 1930. His intellectual gifts were quickly recognized, and he was tutored in anatomy and physiology by Blalock and his research fellow, Dr. Joseph Beard. Thomas’ work ethic and aptitude allowed him to master surgical techniques and research, and his work laid the foundations of congenital complex heart defect repairs at Johns Hopkins in the 1940s.

Circumstances did not allow Thomas to attend college after earning the highest honors in high school. The Depression and lack of opportunity derailed his dreams of pursuing medicine. He beat the odds as he faced poverty and racism to be a pioneer in cardiovascular surgical techniques. Even though Thomas was not mentioned in the development of the Blalock-Taussig, BT shunt, he continued his work and developed further techniques such as the balloon atrial septostomy. This was a significant contribution to the survival of cyanotic congenital heart disease patients.

As a black man in the 1930s, he was not afforded the accolades he greatly deserved. Paid as a janitor, but suturing in the operating room, Thomas is the epitome of selflessly contributing to science for the

betterment of our youngest patients. Famous cardiologists and surgeons such as Blalock, Taussig, Cooley, Haller, and Spencer stood on the surgical foundations that were created by Thomas. He continued to use his mind and hands to carefully perform ground-breaking surgical procedures, while he remained in the shadows outside the operating room. While his name was whispered in the halls where Blalock and Taussig roamed, we now hear “BTT shunt” echoing back at all of us. This opportunity is a significant and essential duty that we should all consider thoughtfully. Many echo labs around the country have slowly but surely transitioned from BT shunt to BTT shunt in their daily reporting to finally honor Dr. Thomas’ contributions. In 1976, Hopkins awarded him an honorary doctorate and named him an instructor of surgery for the [Johns Hopkins School of Medicine](#).

In addition to honoring past efforts and achievements, it is also vitally important to look forward. ASE values this mission very highly, with DIVERSITY being one of its Core Values. The ASE Diversity & Inclusion Policy highlights the inclusive nature of our organization, and that all those in the field of cardiovascular ultrasound are welcome to join. It recognizes the significance of how diversity “drives innovation and contributes to building a holistic culture that will, in turn, enhance our ability to care for our patients and eventually benefit those living with cardiovascular disease. Including diverse individuals adds value to our activities by increasing the range of experience, ideas, and perspectives. We will strive to build a diverse and inclusive organization at all levels, including leadership, staff, councils, committees, task forces, faculty, writing

Paid as a janitor, but suturing in the operating room, Thomas is the epitome of selflessly contributing to science for the betterment of our youngest patients.



***“Life’s
persistent
and most
urgent
question is,
‘What are
you doing
for others?’”***

- Dr. Martin Luther King, Jr.

groups, and other volunteer activities.”

Each February, we also celebrate American Heart Month with a focus on motivating all Americans to lead healthy lifestyles to prevent heart disease. This is even more important in the era of COVID-19. It is also imperative to remember that children with congenital and acquired heart disease need to be active for heart health. Thus, our goal

should be on how to promote safe exercise in this patient population.

The American Heart Association holds The Heart Walk event to raise funds to elevate awareness of these issues. They also offer a [Kid’s Heart Challenge](#), allowing children to volunteer as a Kids Heart Challenge Heart Hero. This program connects them with a child with congenital heart disease, and helps them to raise money for the health of all hearts. Forming a team to walk and raise funds for cardiovascular health awareness is a wonderful way to help our professional and personal communities. Tucked into American Heart Month, is Congenital Heart Defect Awareness Week. The week

of February 7-14, is dedicated to promoting awareness and providing education about congenital heart defects. Congenital heart defects are the most common birth defect, affecting one in a hundred births in the United States. A study published in *Circulation* in 2016 estimated that in 2010, about one million children and 1.4 million adults in the United States were living with a congenital heart defect. There are many simple ways for us to educate others about CHD, with one example being sharing facts about [congenital heart defects](#) on our social media accounts.

In the spirit of service, the PCHD Steering Committee would like to share some of the ways to contribute to our field of pediatric cardiology through the ASE. One way to share your experience and expertise is to apply to serve on one of the many ASE committees or councils. With areas of focus ranging from advocacy to finance and strategy, to research, there really is something for

everybody! Here is a [link to the entire list](#) on the ASE website. We are now exactly six months out from the next call for volunteers, which happens in the fall every year. Planning now gives plenty of time to prepare for that application, such as applying for and earning for your FASE designation! Please see [Way to FASE](#) for all the information you need. For those wishing to give, but unable to make a time commitment, there are other options such as fund donations. One place to do this is with the [ASE Foundation](#) (ASEF). The ASEF funds important endeavors such as scholarships, global outreach, and research not supported by ASE membership dues. [Donating is easy](#), either as a one-time gift, or by joining the Sustainer Club by setting up a monthly donation!

For those looking for a more active way to serve, there are many local community-based youth heart screening programs seeking volunteers. These organizations exist to provide free EKG and limited echocardiogram screening in an effort to prevent Sudden Cardiac Arrest (SCA) in children and young adults. Global outreach is yet another option for service. Despite these global endeavors being impacted by the COVID-19 pandemic, we are hopeful for their return as soon as it is safe for all involved. There are opportunities for that as well through ASEF, or well-respected organizations such as [Team Heart](#).

By highlighting some of the pathways to service, we hope that new inspiration has been found. If you have discovered in yourself a desire to serve, there are many possibilities to explore. As a tribute to Black History Month, may we all take Dr. Martin Luther King’s words to heart.

Ross Procedure

Contributed by: **Andrea Corujo Rodriguez, MD**, Assistant Professor, Division of Cardiothoracic Anesthesiology, Emory University School of Medicine, Atlanta, GA; **Yasdet Maldonado, MD, PhD, FASE**, Cardiac Anesthesiologist, Cleveland Clinic, Cleveland, OH, Guidelines and Standards Committee Representative, ASE Council on Perioperative Echocardiography; **Ratna Vadlamudi, MD, FASE**, Program Director, Adult Cardiothoracic Anesthesiology Fellowship, Associate Professor, Department of Anesthesiology, Emory School of Medicine, Atlanta, GA, Member at Large; ASE Council on Perioperative Echocardiography



PULMONARY AUTOGRAFT replacement of the aortic valve, also known as the Ross procedure, was developed in 1967 and has commonly been used in children with aortic valve disease due to the advantage of avoiding lifelong anticoagulation and low morbidity and mortality.¹ It is grossly underused however in young adults owing to its technical complexity, the possible morbidity associated with neo-aortic root dilatation and pulmonic graft failure, and the complexity of re-interventions.²

Standard aortic valve replacement (AVR) for young adults has therefore typically involved either a mechanical valve, bioprosthetic valve, or an aortic valve homograft. All these options have their pitfalls and numerous studies have demonstrated suboptimal outcomes, especially in restoring normal life expectancy in young adults.³ With these findings, the Ross procedure has recaptured the interest of cardiac teams for adult patients, especially with the promising long-term outcomes from high volume centers.⁴

The Ross procedure has been modified over time. It was first described using a subcoronary technique for the pulmonary autograft but since the mid-1980s, it is typically performed using a full root replacement technique. The latter technique may require additional modifications to mitigate late autograft dilation and subsequent valvular insufficiency, which is one of the leading causes for re-intervention. Regardless of the approach, it does involve additional steps that are not included in a conventional, uncomplicated AVR. These steps include dissection of the aortic root, mobilization of the coronary arteries, harvesting and

implantation of the pulmonary autograft, and pulmonary homograft implantation.³ Intraoperative transesophageal echocardiography (TEE) at baseline should focus on the etiology of the native aortic valve disease, aortic annulus, root, and ascending aorta measurements and pulmonic annulus/RVOT measurements. Some centers utilize aortic xenografts in the pulmonary position but long-term data on the outcomes are lacking.³ Once these steps are accomplished, separation from cardiopulmonary bypass is achieved and tight blood pressure control is maintained in the operating room (SBP < 110-115 mmHg) to prevent dilatation of the neo-aortic root. Intraoperative TEE should focus on obtaining measurements of aortic and pulmonary transvalvular gradients and evaluating for possible immediate complications, such as right or left ventricular dysfunction, segmental wall motion abnormalities from injury to the coronary arteries, and right ventricular outflow obstruction.⁵ After a successful surgery, the pulmonary autograft allows mobilization of all the components of the aortic root and provides superior hemodynamics with consistently lower mean gradients at long-term follow up when compared to standard AVR.⁶ The Ross procedure can therefore provide durability, excellent performance when compared to prosthetic options, potential for survival advantage and can be a feasible first choice in select young patients.³

Despite the mentioned benefits of this procedure, this complex surgery needs appropriate patient selection, as this is a key determinant of the patient's outcome. The 2020 ACC/AHA Guidelines for Management of Patients with Valvular Heart Disease recommends the Ross procedure (COR 2b, LOE

B-NR) in “younger patients with appropriate anatomy and tissue characteristics for whom anticoagulation is either contraindicated or undesirable, and it is performed only at Comprehensive Valve Centers by surgeons experienced in this procedure.”⁸ An ideal patient for the Ross procedure is < 50 years old with a non-repairable aortic valve. The patient should primarily have aortic stenosis and a normal sized aortic annulus and be free from familial aortopathies and connective tissue disorders. Patients with primary aortic insufficiency and a dilated aortic annulus at baseline are not ideal candidates but can still have the procedure with acceptable outcomes with adoption of modified surgical techniques.³

Operative risk from the Ross procedure when compared to standard AVR was known to be higher, with a review of the Society of Thoracic Surgeon’s database showing a three-fold increase in operative mortality in low volume centers (<1 procedure/year) (3). Data from high volume centers are reassuring however with an operative mortality of 0.3-1.1%, which is similar to standard AVR (3). Morbidity can be related to the autograft or pulmonary homograft

and includes valve degeneration, annular dilation, neoartical valve regurgitation and need for reintervention due to degeneration of the pulmonary homograft.^{7,8} Most reoperations for autograft failure are due to dilation of the annulus, sinuses of Valsalva, or sinotubular junction.³ Surgical techniques have been developed to support and stabilize the neo-aortic root for patients at risk for autograft dilation, which includes patients with aortic insufficiency, dilated annulus and/or ascending aorta, and aortic/pulmonary valve size mismatches at baseline.³ In addition, patients should be screened for elevated systemic and pulmonary arterial pressures, as these comorbidities are associated with early degeneration of the autograft and pulmonary homograft.³ A recent systematic review demonstrated that patients who underwent a Ross procedure had a significantly reduced stroke rate as well as a reduction in bleeding events when compared to patients after mechanical AVR.⁷ Notably, patient rating of quality of life is high when assessed in post procedure surveys, thanks to avoidance of anticoagulation and excellent hemodynamic performance.³

▼ Image 1



▼ Image 2

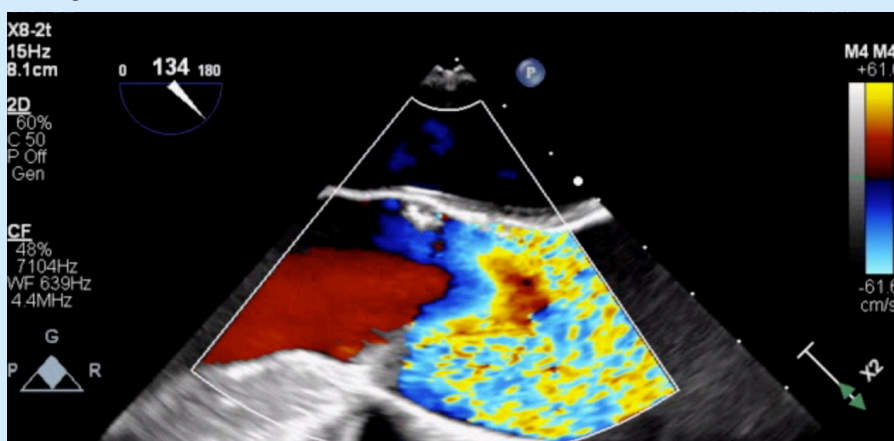
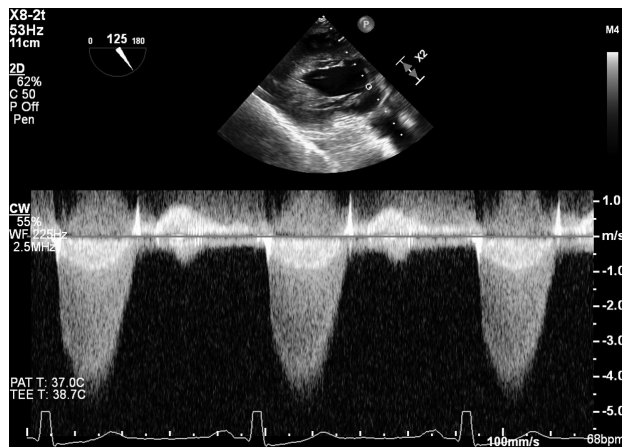


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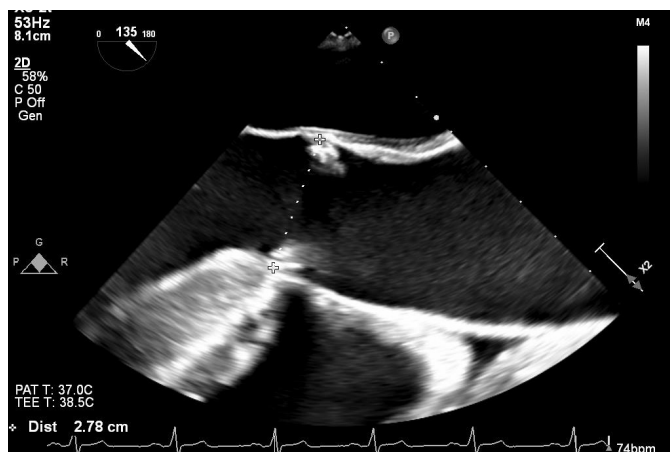
- Image 1** ME AV SAX of Bicuspid AV
- Image 2** ME AV LAX Showing AS
- Image 3** Elevated Gradient Across Stenotic AV
- Image 4** ME AV LAX with Aortic Annulus Measurement
- Image 5** ME RV Inflow-Outflow with Pulmonic Annulus Measurement
- Image 6** Post-Cardiopulmonary Bypass Gradient Across Neoartical Valve
- Image 7** Post-Cardiopulmonary Bypass Gradient Across Pulmonary Homograft

In summary, the Ross procedure is increasing in popularity, as it can offer excellent outcomes when performed at experienced centers and in appropriately selected patients. These centers should also be equipped to address long-term management of these patients, including autograft and allograft failures and future percutaneous interventions. Creating teams dedicated to caring for young aortic valve patients beyond the standard AVR is vitally important.

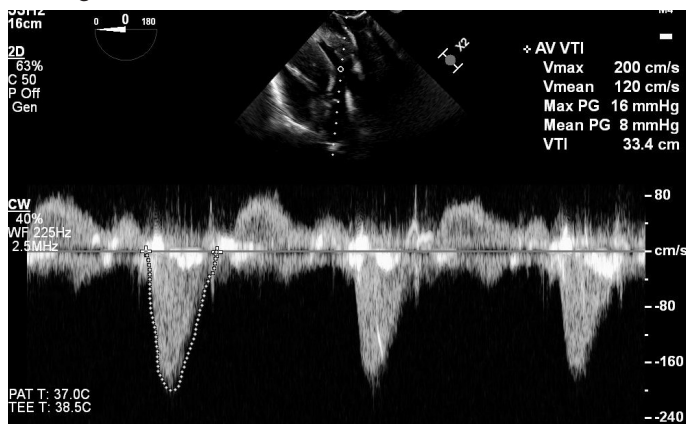
▼ Image 3



▼ Image 4



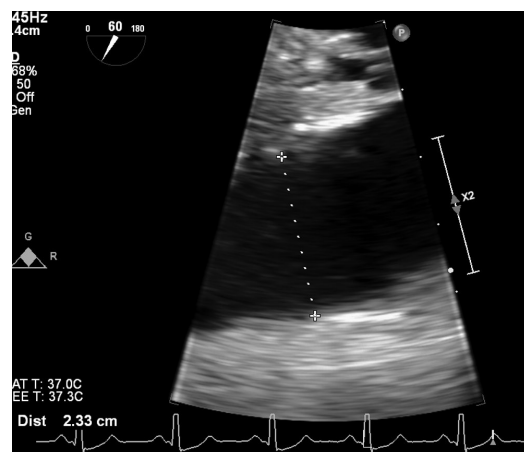
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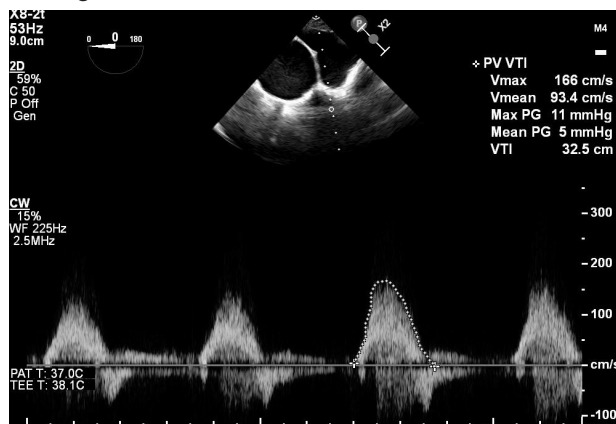
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▼ Image 5



▼ Image 7

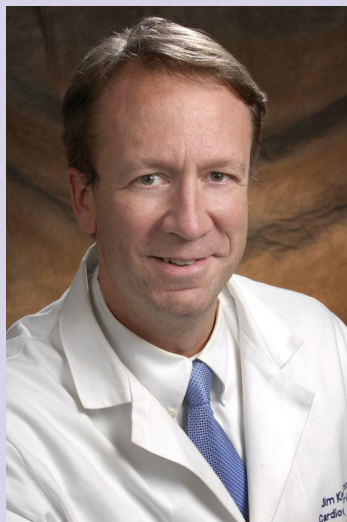


Echo is a Universal Language

Contributed by: **Keith Collins, MS, RDCS, FASE**, Lead Cardiac Sonographer-New Technology, Northwestern Medicine, Chair, ASE Sonography Council, Member, ASE Board of Directors, @KeithC_echo



In 2016, I applied and was selected to join the ASEF global outreach event in Xian province, China, organized by current ASE Treasurer, Dr. Cynthia Taub. Nervous about going to a central Chinese province, I was encouraged by the stellar team assembled. Physicians involved were Drs. Taub, Vera Rigolin (previous ASEF Chair), Jose Banchs, Dali Fan, and David Slovut. Sonographers Erica Chung and Jian Zhang had more pediatric experience and language ability. I was selected for my experience with 3D scanning and teaching. I prepared lectures requested on scanning for mitral stenosis and set off on a professional adventure I now treasure. We trained, taught and scanned at the ‘small’ city (pop. ~7M), to a city of just over 100K, and a remote city. Always met with grace and kindness, our team spent seven days seeing incredible echo cases, learning how quickly the Chinese physicians scan and assess disease. We encouraged comprehensive evaluation including 3D assessment and felt amazed at the rabid excitement with which the Chinese incorporated the ASE guidelines, recently translated into Mandarin.



Jim Kirkpatrick, MD, FASE, FACC, is Professor of Medicine, Cardiology and Bioethics and Humanities (adjunct) Section Chief, Cardiovascular Imaging Director, Echocardiography, University of Washington Chair, Ethics Committee, University of Washington Medical Center, Ethics Consultation Service, Aortopathy Clinic, at the University of Washington Medical Center. He is the 2022-2024 Chair of the ASE Foundation.

As a working sonographer and educator, this experience transformed the way I saw echo involved in cardiovascular care worldwide. I was honored to share my experiences with the ever kind and welcoming Chinese clinicians. Upon returning to the United States, I was motivated to continue this work. I applied the next year for ASEF events in China and Vietnam. I was selected for the Vietnam team. It was a great experience, and I want to share the following conversation I had Dr. Jim Kirkpatrick, co-organizer of the ASEF event in Vietnam.

Interview with Dr. James Kirkpatrick-ASEF Vietnam

KC: I’m here virtually with Dr. James Kirkpatrick, cardiologist, researcher, POCUS expert and my friend. Reflecting on our trip to Vietnam on an ASE Foundation global outreach event in October 2017, I was able to play a key role in a multi-year collaboration in research, training and education events. Even better, I made long-term friendships. Jim, what has been your experience?

JK: Keith, thank you so much for the opportunity to share my perspective, and thank you so much for joining our 2017 trip. Your expertise in 3D and echo in general was greatly appreciated by our Vietnamese colleagues who benefitted from your training, and by the patients you scanned. In answer to your question, I’d fully agree with everything you said. Being part of multi-year collaborations has allowed us to conduct research and participate in development of a program to train healthcare professionals other than physicians in performing cardiac ultrasound, potentially leading to expansion of echo services to remote areas. As in many countries, there are no sonographers in Vietnam, but, in part because of our involvement and the fact that their main academic hospital in north Vietnam performs 120,000 echos per year, our

exceptional colleagues, led by Dr. Hoai Nguyen of the Vietnam National Heart Institute, are laying the foundation for a sonographer training program. But we can't lose site of the fact that ASE sonographers have played a major role in educating the current physician-echocardiographer workforce in Vietnam, both in-person and at virtual national congresses during COVID time (with thousands of attendees).

KC: I know that you and Dr. Banchs have unique ties to Vietnamese culture and that must have influenced your interest in building partnerships with Vietnamese echocardiographers. How did you get started and organize your first global outreach event in Vietnam?

JK: We are both married to Vietnamese immigrants, but we “found” each other through ASE. Mutual colleagues knew we were both interested in echo outreach in Vietnam and made the connection. We had multiple phone calls in organizing our 2013 trip to Hue in Central Vietnam. Exceptional ASE sonographers played a key role in scanning patients in remote villages.

KC: I know that you are a strong advocate and supporter of sonographers in echo and selected specific FASE sonographers for the trip, based on their abilities and experience scanning, training and teaching. I was happy to create and present lectures on the assessment of restrictive cardiomyopathy, 3D assessment of valves and present them at Thanh Hoa hospital in Hanoi and the Vietnam National Heart Association (VNHA) meeting. With such a high presence of rheumatic heart disease in Vietnam, showing comprehensive assessment of valve disease with 3D was fun and rewarding. What specific benefits do you think sonographers bring to these global outreach events?

JK: To be perfectly honest, these trips don't happen without sonographers. They are the heart and soul of the trips, central to hands-on scanning training of physicians and, let's call them “proto-sonographers”, to the lectures, and, of course to the scanning of patients in village health centers. In addition, none of the research happens without ASE sonographers. In our “virtual training villages” during COVID times, sonographers provide unique, “hands-on” scanning lectures that are not easy to find elsewhere.

KC: When selecting a team of physicians and sonographers, what skillsets and experiences do you look for from the sonographer applicants?



Dr. Taub and I demonstrating 3D views, Xian, China Sept. 2016



Dr. Banchs, Jian, and I enjoying a break with our new Chinese friends. Shaani, China Sept. 2016

JK: ASE has general guidelines that are very helpful, and each outreach leaders have the benefit of working with Andrea Van Hoever from ASE in developing more specific criteria. I greatly appreciate the thoughtful way that ASE goes about selecting participants. We've been blessed to have many applicants for our trips who fit our needs in terms of scanning experience, lecture/training skills, and flexibility and ability to handle the curveballs that always come on outreach trips. Of course, it is always helpful to have language skills, even though translators are usually readily available.



Our ASEF team with our Vietnamese friends on a scan day. Dong Ve, Vietnam Oct 2017

KC: Each global outreach event in Vietnam had multiple components of teaching, scanning, and training. During our trip, we performed community patient scans at a clinic outside Hanoi, gave lectures at the VNHA conference and performed basic and specialty training in Thanh Hoa Hospital. Are there some initiatives that continue from one trip to another? Do you develop the program from specific requests from our Vietnamese partners, our unique ASE initiatives or both?

JK: Great question. We have attempted to develop both longitudinal and outreach-specific components. Our research publication combined data from multiple trips, as we used the same scanning protocol, but we also addressed different research aspects in each trip, including specific training focuses for “proto-sonographers”. We develop specific educational components in terms of training villages, national and international congresses, and local symposia, in collaboration with our colleagues in Vietnam and conference organizers. Our colleagues have translated ASE guidelines into Vietnamese, focusing on the guidelines pertinent to our topics. For instance, our virtual training villages focused on aspects of scanning, so we made copies of the translated “Performance of a Comprehensive Echocardiogram” guideline.

KC: This experience in Vietnam, as well as the ASEF global outreach event to Xian, China in 2016 in which I participated, have been so personally fulfilling and given me a world perspective that awes me. I feel we learn as much from them as much as they learn from

us about ASE guidelines and disease-specific education we try to impart. That perspective informs and guides me in my sonographer position in the US. For anyone interested in participating, can you share how the growth of these personal friendships and professional partnerships has affected your practice?

JK: I can report a similar perspective on the trips. I’m continually amazed at both the differences and similarities between the professional colleagues and patients in different countries. I understand my own patients and myself better, given the ability to reflect when stepping out of my native environment. We just invited Dr. Hoai Nguyen to give a lecture at our University of Washington echo conference on the topic of Echocardiography and Women, A Perspective from Vietnam. I think these collaborations make us all aware of opportunities for two-way learning.

KC: Working closely over the 10 days, we worked hard and had time to enjoy Vietnam as well. I worked closely with you, Drs. Susan Mayer, Greg Tatum and Eric Bonno. We had such a wonderful group of sonographers with Jen Mercandetti, Barry Canaday, Debra Herring, Carol Mortier, and Michele Fujioka. ASE Deputy Director Andrea Van Hoever helped to coordinate the logistics and keep us on track. Even better, we extended our ASE family to include wonderful Vietnamese physicians, who became active ASE members. These long-term friendships and partnerships are so mutually beneficial and speak to the goals of ASE Foundation. I feel so very connected to our Vietnamese colleagues, even after the trip. How does the ASEF continue to foster these international

relationships, especially over long-distance and during COVID, with sonographers involved?

JK: Thanks so much for the opportunity to highlight sonographer participation in the recent Asian Society for Cardiovascular Imaging Congress and the Vietnam National Heart Institute Congresses of the last two years. In each of these, sonographers participated in virtual training villages, giving lectures and demonstrating scanning tips and tricks. Carol Kraft, Jane Marshall, Egle Burdulis, Joan Brennan, Danielle Labadie, Jennifer Tresness, Nikhil Pasumarti, Linh Kieu, Dylan Johnson, Becky Schwaegler, Eric Kruse, Ashlee Davis, Todd Zwink, Giang Cao, and, of course, yourself and others contributed wonderfully!

KC: Finally, thank you, and all involved at ASEF, for including me on this important work. I have always loved to travel, exploring Europe, South and North America and some limited visits to Asia. Seeing Vietnam was exciting, especially through the professional lens of how echocardiography is performed there and efficiently with so many patients. As a foodie, I marveled at the Vietnamese hospitality and grace with which they shared their culinary world. Sharing wonderful meals, talking about our backgrounds, we connected over food and a passion for echocardiography. I look forward to seeing our Vietnamese friends in Seattle for the 2022 ASE Scientific Sessions. Hopefully our ASE colleagues will seek them out in the program and welcome them. How can interested sonographers seek out information on upcoming ASEF global outreach events?



JK: Keep tabs on the ASEF website and look for emails announcing future opportunities.

ASEFoundation.org/Why-Donate/GlobalHealth

Eric, Jim, Michele and Barry make a new Vietnamese friend.



Always time for dinner with our new friends! Hanoi Nov. 2017.

The Benefits of Becoming a Member of a Medical Outreach Team

Contributed by: **Kathy Olejnik, BS, RDCS, ACS, FASE**, Yale New Haven Hospital, New Haven, CT, Member at Large, ASE Council on Cardiovascular Sonography



“**C**OME FLY WITH ME, LET’S FLY, LET’S FLY AWAY....” - FRANK SINATRA
American writer, philanthropist, and naval officer James A. Michener once said: “If you reject the food, ignore the customs, fear the religion and avoid the people, you might better stay at home.” James Michener could not have been any more correct. Traveling, be it for work or pleasure, comes with a lot of inconveniences, uncertainties, and unknowns. But there is nothing more gratifying than coming back from any trip and knowing that something within you has changed. Something nameless.

Young patients in Bali.



Being a member of medical outreach teams has been one of the most gratifying things I have ever done in my professional life. I have been traveling and discovering the world for over 28 years now but there are no places in the world that changed my perception on life more than trips to Bali in 2017 and Nepal in 2018. In 2017 I had a privilege of traveling to Bali with a group of Yale physicians where, in two days, we screened over 250 youngsters for rheumatic heart disease in a very rural and mountainous area.

In 2018 I had a chance to be one of the members of the large group of sonographers and physicians who went to Bhaktapur, Nepal to teach nursing and medical staff the intricacies as well as importance of performing routine and emergent echoes.

In this article I would like to talk about my experiences from the trip to Nepal. Finding myself in Nepal became obvious to me when our airplane pilot announced to all passengers that he was not receiving permission to land yet. He had no choice but to circle around the area and give us a 45-minute overview of the Himalayan Mountains. How often in life are we “forced” to see Mount Everest from the airplane?

Yes, traveling is wonderful but there is something that I would like to explain in greater detail. One of the biggest misconceptions that seems to exist in medical society (at least it appears to be very dominant in my circles) is that we (meaning any person or group of professionals coming from the United States) are teaching or training the locals. It is not US teaching THEM. It is a very mutual process of teaching and learning. The concept of US teaching THEM couldn’t be any further from the truth. In my experience



Enjoying time with nurses in Bhaktapur, Nepal.

all parties involved gain an unbelievable amount of knowledge which may not be apparent at first.

When I arrived in Nepal in March 2018, I must admit I was slightly terrified from seeing how the local hospital even functions, considering the level of sanitation and hygiene. And yet they do. There were things I haven't seen in my life, and they were not necessarily good things. The group of nurses that I was there to train is probably a group of the most dedicated professionals I ever had the privilege of working with and teaching. Their level of interest was unbelievable.

Being a member of medical outreach teams has been one of the most gratifying things I have ever done in my professional life.

Every morning, we would gather together and have a class about a particular subject. After that, we would go to their Echo Lab and perform echoes on patients who were previously seen by a cardiologist.

One of my first shocks (I will use that word for the lack of a better one) was seeing their echo machine. It was one of the oldest versions of Philips CX50 portable machines. In my echo lab, we did indeed have that piece of equipment but it was tucked nicely into the corner of our supply room. I don't think we even use it anymore. I do not exaggerate when I say that my lovely Nepalese friends treated their Philips CX50 machine like their Nobel prize. I remember it took me few minutes to refresh my memory and remember how to navigate through it

but we managed to perform really good, diagnostic studies on it eventually. When you find yourself in an environment with limited resources you have no choice but to be creative and learn new ways if you want to be successful.

In my professional life I have not met an individual or a group of people that showed such a hunger for knowledge. As we all know, there are some concepts of echocardiography that require a deep understanding of multiple diseases and many concepts are also a part of a "chain reaction." Those concepts are challenging to understand in your native language. The fact that our lectures were provided in a foreign language to the local medical staff emphasizes their commitment and desire to learn.

In those three weeks that I spent in Bhaktapur, I may not have gained much of a "book knowledge" of how to perform my job better but I received a wonderful life lesson.

I learned:

- *how to do more with so much less or with barely anything;*
- *that you can truly teach ONLY those who really want to learn;*
- *that if you truly want to learn – NOTHING will stand in a way of doing it;*
- *that you don't need a very expensive device or piece of equipment to do good for others;*
- *that you can achieve great things but ONLY if you work with open-minded people and you yourself remain open-minded.*

I also would like to make something very clear. Nothing that I mentioned was meant to belittle, humiliate, or demean any persons, events, or situations in Nepal. It is a known fact that the country of Nepal is underprivileged but they are doing a great job trying to improve and catch up with highly developed countries.

In those three weeks in Nepal, I gained friends for life, and I learned things that I will never forget. One thing is for certain – being a member of an outreach team will teach you things that no book in this world possibly could. As Evan Esar said, "You can't do anything about the length of your life, but you can do something about its width and depth." Don't be intimidated by the challenges, go widen your horizons. I highly encourage you to participate in a medical outreach event. It will definitely change your perspective and likely change your life!

ASEFoundation.org/Why-Donate/GlobalHealth

Honoring a True Echo Pioneer and Mentor:

ASE's 6th President David J. Sahn, MD, FASE

Remembering David J. Sahn, MD

Contributed by: **Lilliam Valdes-Cruz, MD**, Physician Emerita, Director (Retired), Pediatric and Congenital Cardiac Imaging, The Heart Institute, Joe DiMaggio Children's Hospital, Hollywood, FL

It is difficult to remember a time when there was no imaging – other than X-rays – with which to look at hearts. But in the late 1960s a new technology emerged which offered the promise of looking at the beating heart using ultrasound waves. David joined University of California San Diego (UCSD) as a Pediatric Cardiology Fellow under Bill Friedman and his imagination was captured by this new tool and its possibilities for diagnosing congenital cardiac anomalies. At the beginning the technology was primitive and, although easier in its application for young children, still was in its infancy with mostly linear arrays and M-mode scanners into the early 1970s. The first M-mode echo I saw was during my senior year of Medical School at Georgetown University (1972) when my mentor at the time, Joseph Perloff, called me in to show me the images. Clearly, we had very little idea what we were looking at and certainly could not have guessed the importance echocardiography would gain in the diagnosis and management of pediatric (and adult) heart disease.

However, by this time, David had joined University of Arizona under Stan Goldberg and Hugh Allen who were pioneers in the application of the early technology in infants at a time when



David J. Sahn (1945-2021)

survival of premature babies was improving and establishing the presence of a ductus arteriosus was critical to their management. Walt Henry at NIH developed a mechanical sector scanner which allowed two-dimensional imaging and David and the group in Tucson were instrumental in its application in congenital

cardiac malformations. By 1975 they performed the first two-dimensional fetal echo.

I had the opportunity of meeting David in 1975 when I presented the first contrast echo paper using M-mode at the Scientific Sessions of the American Heart Association (AHA), demonstrating the presence of intracardiac right to left shunting in children. At that time, I was a Fellow in Pediatric Cardiology at Johns Hopkins under the mentorship of Richard D. Rowe and more specifically Daniel Pieroni in echocardiography. We had discovered the effect of microbubbles on M-mode echo images during an examination of an infant in the Intensive Care Unit while a nurse quite by chance performed a peripheral venous injection. We then proceeded to elucidate what that appearance was in other patients and in animal studies that were being conducted as part of an unrelated electrophysiologic research. Those results formed the presentation at the AHA. I also met Walt Henry at that same meeting.

I joined the group at the University of Arizona in 1979 as a very young Assistant Professor. David had developed relationships with engineers in the various companies and eventually he had availed himself of novel spectral and color Doppler equipment. As a result, multiple studies were conducted and published validating Doppler velocimetry in patients and in animal models. With the help of experienced animal surgeons, we created acute models of atrial and ventricular septal defects as well as stenosis caused by banding of pulmonary artery and aorta which served to look into the applicability and accuracy of flow volume calculations and of the Bernoulli equation in vivo. Later, after moving to UCSD together in 1983, David was approached by Ajit Yoganathan of the Engineering Department at Georgia Tech and that relationship resulted in multiple publications validating ultrasound Doppler with laser Doppler velocimetry in vitro. This collaboration was very enriching to our knowledge and understanding of Doppler. Notably, when Franco Recusani from Pavia, Italy, approached David with his original mathematical formulas proposing the Doppler flow convergence method for calculating mitral valve regurgitation (later known as the PISA method), it was at Ajit's flow laboratory at Georgia Tech that the initial validation against laser Doppler was conducted and later published in *Circulation* in 1991.

Besides his major contributions in the field of clinical echocardiography, it is my belief that David's willingness to support and mentor multiple young scholars from many different countries has to be one

of his foremost gifts. The list is too long to include here but names such as Carlos Oliveira Lima, Benedito Maciel, Susana Horowitz, Valdir Moises from Brazil, Ian Simpson from the United Kingdom, and Takahiro Shiota from Japan are a few of the many who became renowned in their respective countries and internationally following periods of mentorship with David in our research laboratories. Further, he sponsored and served as advisor to several engineering graduate students in their Master's and PhD dissertations. Notably Robin Shandas, PhD, who did his dissertation under David's supervision at UCSD started the Biomedical Engineering program at University of Colorado, Boulder and is its current Chair.

A true teacher and pioneer are one whose contributions serve to benefit patients and offer inspiration to others and in particular to later investigators. It is without doubt that David is such a true teacher and visionary. We will miss him.

Dr. Sahn's final ASE President's Message in the November-December 1988 *Journal of the American Society of Echocardiography*.

AMERICAN SOCIETY OF ECHOCARDIOGRAPHY NEWS

President's Message

I have been the president of The American Society of Echocardiography for 2 years. Enclosed are photographs to show that I have been changed by my tenure serving you. All kidding aside, these old photographs of me (from at least 6 months ago) come from an era when my nickname was "Ultrasahn." In all seriousness though, it has been a pleasure being the president of this organization. It has a superb management team; an energetic hard-working board of directors; a membership that is concerned, calls about their questions, writes letters, volunteers openly for projects, and keeps the central office breathing on their local issues.

I am proud to say that during the 2 years that I have been president, we have seen the successful beginning of our JOURNAL, a legacy that to some extent was handed to me by Tony DeMaria, the previous president, and a smoothly functioning Publications Committee headed by Al Parisi, your next president. The organization has weathered the establishment of that JOURNAL and a restructuring of its dues philosophy to include the cost of the JOURNAL subscription and yet has grown in membership by 11% in the last 2 years. Its budgetary reserves have grown by 126% in the 2 years, and we pass on a firmly established, fiscally sound, mature organization that has interacted in major ways to clarify issues related to echocardiography with the American College of Cardiology, the American Heart Association, the Food and Drug Administration, and third-party payers. It is an organization that should have forthcoming new standards for quantitation of left ventricular function; new standards for evaluation and anatomic orientation of esophageal echocardiography; a standard for display in color flow mapping; and new white papers in fetal echocardiography, pediatric echocardiography, contrast echocardiography, and indications for transesophageal and interventional intravascular studies with ultrasound. To Al Parisi, your next president, and to your incoming vice president (who will be president after Al, Ned Weyman) I wish that your years as president of this organization are as pleasant as mine were and that you will be as grateful and as pleased as I am that you can



Figure 1 David Sahn



Figure 2 "Ultrasahn" and friends.

look back on your service to the American Society of Echocardiography with warm thoughts of good times, hard work, and pride of accomplishment.

David J. Sahn, MD

Highlights of Memories of David Sahn, MD

Contributed by **Stan Goldberg, MD**, Professor Emeritus, University of Arizona, Founder and Consultant, Advanced Lipidology

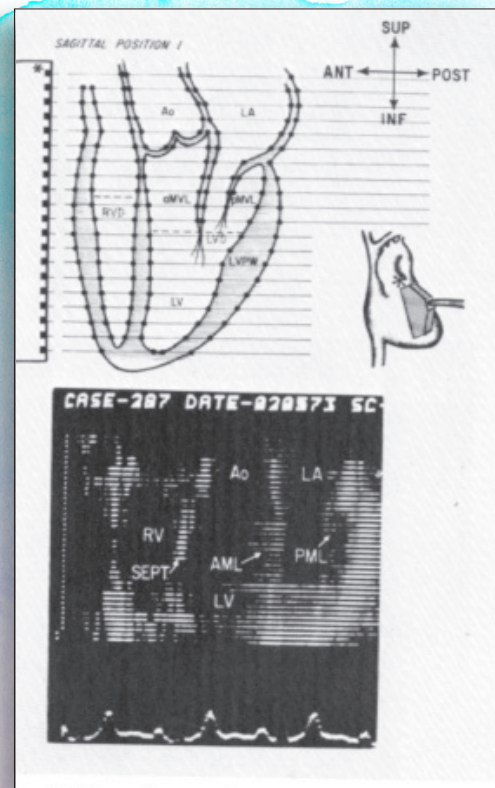
In this tribute to David Sahn, I will address his early career. In 1973 Hugh Allen joined me as a faculty member at the University of Arizona in pediatric cardiology. Both of us were doing echocardiography and we came across a paper by David Sahn regarding echocardiographic studies in children. To our knowledge at that time, he was the only other person doing pediatric echocardiography, and we decided to visit him in San Diego. David showed us very early 20 crystal linear array two dimensional echocardiograms that he had performed, and we decided that it would be accretive if the three of us could work together in this very early stage of echocardiography. David soon joined as the third faculty member in pediatric cardiology at the University of Arizona. In early 1974 we were able to acquire a minimally updated version of this linear array scanner. This device arrived several months later and shortly after its arrival, the FDA embargoed further two-dimensional scanners for the next several years. David arranged to have Walter Henry from the NIH bring his experimental phased array to Tucson so the only 2D echocardiographic machines in the country could be compared side-by-side on the

David's chapter on two-dimensional echocardiography was the first detailed account of how to accomplish several planes of examination and interpret 2D cardiac images.

same patients. This was the beginning of the second stage of two-dimensional echocardiography, and David was clearly the pioneer in this area. The three of us then wrote the first book regarding echocardiography in congenital heart disease. David's chapter on two-dimensional echocardiography was the first detailed account of how to accomplish several planes of examination and interpret 2D cardiac images. David also did the first transesophageal echocardiogram by swallowing a single crystal disc shaped transducer mounted on a thin wire cable which was moved up and down through his esophagus while collecting images of cardiac structures. David mentored numerous individuals. As an example, Kathy Reed,

an OB-Gyn resident at that time, worked with David to do some of the first fetal cardiac studies. During his nine years at the University of Arizona, David authored and co-authored many publications regarding ultrasonics in congenital heart disease. In 1983 David left Arizona to become the head of pediatric cardiology at the University of California at San Diego and began his work with color-coded Doppler in 1984. Some years later he went to the University of Oregon and devoted most of the rest of his career to research in ultrasonics and other imaging modalities.

David was not only a pioneer, but he was also an outstanding lecturer and illustrator of the technology that he utilized. Further, he was an astute clinician and clear thinker. David worked with engineers and other scientists to advance imaging throughout his career. He made major and lasting contributions to pediatric cardiology, and we all will miss him.



An early illustration made by David with the 20 crystal linear array circa 1974.

Mentor, Musician, Master of Echo – You Will be Missed

Contributed by: **Hugh D. Allen, MD**, Professor of Pediatrics, Baylor College of Medicine, Texas Children's Hospital

David Sahn joined us in Tucson at the University of Arizona in 1974. He had been a fellow at San Diego under Bill Friedman and was noticed by Stan Goldberg and myself for his work with a 2D echo imaging Octason system (that took a great deal of imagination to see, but it worked). We intentionally stacked the echo deck by recruiting him and Lilliam Valdes-Cruz to Tucson. What an exciting time! This was when the stalwarts thought echo was a passing fad and relied solely on EKG, chest roentgenography, and catheterization of all newborns who were cyanotic as well as most other patients in whom diagnosis was elusive.

David was instrumental in changing at least some of those who held those opinions by publications, presentations, lectures, and visiting professorships. He was a clairvoyant who was always thinking ahead, and developing the next studies to be done that showed the usefulness of echo. He was a master trainer, and along with Stan and Lilliam, shepherded many U.S. and international trainees who then took echo back to their institutions. It was amazing to watch him work with the fellows during abstract season. He continued to maintain contact with them and was instrumental in their ongoing progress.

David later showed the same enthusiasm to MRI and was one of its early developers. It is interesting to note that today's imagers tend to think that they thought of the technique, but we should remember where it all started.

David was always unique. He, as a youth in Brooklyn, played backup bass guitar for the Kingston

trio. He was also a violinist. I recall that when we were preparing for the cardiology board exams together, he had absolutely meticulous study notes (that only he could read). We roomed in a hotel the night before the oral examinations after a night of Greek food and a bottle of Ouzo wine with Bill Berman. At 3:00 AM he got up to trim his beard so that Dr. Nadas would not be offended. The floor by the sink was very springy the next morning. We passed.

The world will miss his brilliance, his unique personality, and his contributions. I will miss him personally. Rest in peace, David.

He was a clairvoyant who was always thinking ahead, and developing the next studies to be done that showed the usefulness of echo.



Jack Rychik, MD, (left) with David Sahn at the 2003 ASE Scientific Sessions when Dr. Sahn was honored with the Council on Pediatric and Congenital Heart Disease Founders' Award.

Additional Tributes to Dr. Sahn from ASE Members

Editor-in-Chief of the *Journal of the American Society of Echocardiography*, Michael H. Picard, MD, FASE, is writing a tribute on Dr. Sahn that will appear in an upcoming issue of JASE.

Friends: For those who didn't know him well, David was an amazing mentor, researcher, and human being who spent the last several decades of his career here at OHSU. He was, without question, one of only a handful who made huge impacts in the earliest days of echocardiography. He was one of the founders of pediatric echo and his contributions have been treasured by cardiologists who are familiar with the origins of non-invasive cardiovascular imaging. I'm not sure OHSU ever really realized exactly what he meant to pediatric cardiology. He was a clinician who was extremely well-versed in engineering. As such, he had a lot of say in transducer design and 2D beam forming as the field of echocardiography was being born. To call him "one of a kind" is an understatement; not because of his eccentricities, but because he was one of the kindest, gentlest souls you will ever meet. He loved science and he loved mentoring generations of early career clinician-scientists who loved him right back.

He was a treasure and this world is just a bit sadder without him.

Jonathan R. Lindner, MD, FASE
Oregon Health & Science University,
Portland, OR

David and I collaborated for over 40 years. Once after a consulting meeting in New Jersey we stopped at my mother's house in Bayonne, and she was incredulous that he was a famous cardiologist. A ponytail, blue jeans, and a peace belt. He was one of the true early adopters of ultrasound and spread the word, and his impact upon echo will be enduring.

Anthony N. DeMaria, MD, FASE,
University of California, San Diego,
San Diego, CA

David was a key thought leader applying physical principles to echocardiography and always an incredibly fun guy to be around. I will miss his company.

James D. Thomas, MD, FASE
Northwestern Medicine, Chicago, IL

David was really one of the first to embrace 2D ultrasound in Cardiology. He was "one of a kind" and a wonderful companion as we all went on the road to sell echocardiography to the rest of the world.

Richard Popp, MD, FASE
Stanford University Medical Center,
Palo Alto, CA

I read his book as I started echo in the Philippines in the 1980s and had opportunities to listen to his presentations at ASE meetings. A legend, hero, an icon in Pediatric Echocardiography. Thank you for your works in echocardiography and service to humanity.

Eli Diolanda
Trillium Health Partners,
Mississauga, Ontario, Canada

I remember his memorable speech as he accepted the ASE presidency during which he changed from a suit to his usual casual uniform. A fantastic colleague who will be dearly missed.

Roberto M Lang, MD, FASE
University of Chicago, Chicago, Illinois

Here are a few tidbits that come to mind from when I had the honor of working with David for several years:

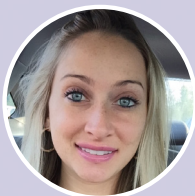
- David was an Eagle Scout and would camp in Central Park. His father was Council Commissioner of New York. He even showed me his Eagle Scout uniform.
- He always showed individuals who visited his office his picture of him and Pope John Paul II when they met at the Vatican. In the picture, he was wearing his famous peace buckle belt.
- He told me, "Always write a script when you do any type of presentation, this keeps you on track." This was surprising to me because he was such an accomplished presenter and had a wealth of knowledge.

Robert W. McDonald, RCS, RDCS, RCCS, ACS, FASE
Doernbecher Children's Hospital - Oregon
Health Science University, Portland, OR

He will be remembered as a creative thinker who helped pioneer the field of echo and ASE.

Vera Rigolin, MD, FASE
Northwestern Medicine, Chicago, IL

IMAGES FOR LEARNING

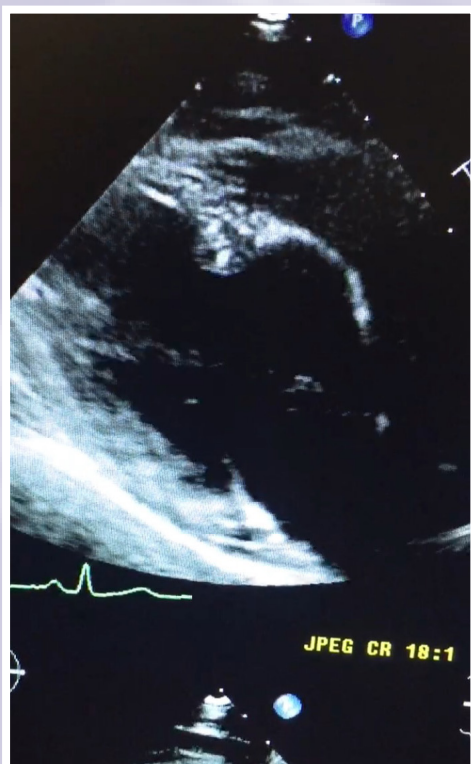


Contributed by:
Christina Sarratori, RCS, Technical Director

In the early 1960's cardiology changed for the better when Dr. W.P. Cleland performed the very first septal myectomy. Also known as the Morrow operation or myomectomy, this cut and go surgery changed the game of cardiology and health. Dr. Andrew Glen Morrow pioneered this procedure for decades to come. For an echocardiographer, post-surgical treatment scans are a must.



→
**Parasternal Long Axis View
or "PLAX", Basal septal
Myocardial Infarction
vs. Myomectomy**



←
**Parasternal Long
Axis View or "PLAX"**



→
**Apical Four
Chamber View**

Photo credit the University of Alabama Medicine

In Memoriam:

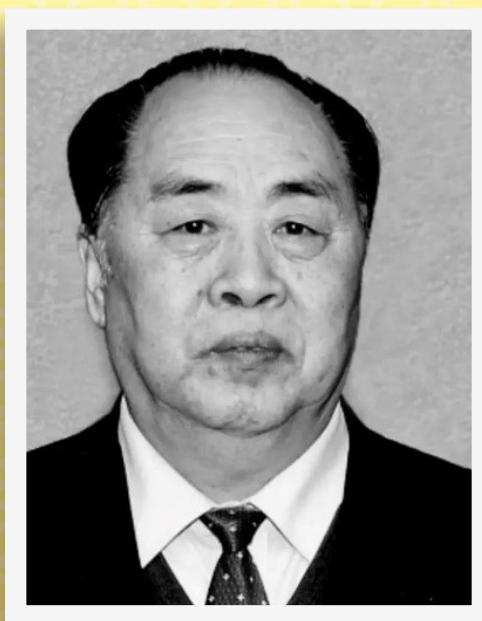
PROFESSOR XINFANG WANG, MD, HONORARY FASE (1934-2021)

Contributed by **Feng Xie, MD**, Professor in Medicine, University of Nebraska Medical Center, Omaha, NE, and **Leng Jiang, MD, FASE, FACC**, Professor in Medicine, Tufts University & University of Massachusetts, Springfield, MA

We were overwhelmed with sadness to hear of Dr. Xinfang Wang's passing at the age of 87 on November 30, 2021. Dr. Wang was one of the pioneers of ultrasound medicine and founders of modern echocardiography in China. He was our most esteemed and memorable teacher and colleague in our motherland.

Dr. Wang was born on September 28, 1934, in a teacher's family in rural Henan, China. Unlike many other children in the countryside at that time, he was able to complete high school and enroll in college with the firm support of his parents. Dr. Wang graduated from Tongji Medical College, Wuhan in 1958. He became Associate Professor of Medicine and Director of the Echocardiographic Department at Union Hospital of the Tongji Medical College in 1980. In 1986, he was promoted to Professor of Medicine and Deputy Director of the Institute of Cardiovascular Disease at Tongji Medical College in Wuhan, now called the Cardiovascular Institute of Huazhong University of Science and Technology. Dr. Wang quickly emerged as a national leader in the cardiac ultrasound field and served as President of the Chinese Ultrasound Society in

1999, Editor-in-Chief of the *Chinese Journal of Ultrasonography* from 1999 to 2003, and Editor-in-Chief of the *Chinese Journal of Medical Ultrasound* from 2003 to 2010.



Dr. Wang first started to learn ultrasound in 1961 and focused on the heart using ultrasound (echocardiography) in 1963. Dr. Wang and his colleagues have accomplished many pioneering works in China, such as detecting pericardial effusion and diagnosing rheumatic mitral valve stenosis with M-mode echocardiography in the early days. Notably, in 1963 Dr. Wang discovered the waveform characteristics of the fetal heart reflex by ultrasound and the earliest time it could be detected, which had significant impact on determining fetal viability.

The results from 140 cases were published in the *Chinese Journal of Obstetrics and Gynecology* in 1964, which was the earliest report in the field of fetal echocardiography. In 1965, Dr. Wang revealed the opening snap in mitral stenosis coinciding with the E-peak of M-mode tracing, by a prototype echo system combined with phonocardiogram. In 1979, Dr. Wang with his colleagues invented contrast echocardiography by injecting a small dose of hydrogen peroxide

in a series of animal experiments and clinical trials, contributing to the development of contrast echocardiography in China. Incredibly, the first human tested with the intravenous hydrogen peroxide was Dr. Wang himself! In 1975 Dr. Wang wrote the nation's first textbook of echocardiography, which was formally published in 1981. Both of us were immensely nourished by his book during our early career development, as were many others.

Over the following decades, Dr. Wang, with his outstanding acumen, intellect, and passion, continued playing a leading role in the nation, introducing and promoting the cutting-edge technology of echocardiography, including color Doppler imaging, transesophageal echocardiography, and three-dimensional and four-dimensional echocardiography. Dr. Wang authored and co-authored 197 peer review articles, which have been widely cited. Dr. Wang's *Textbook of Echocardiography* has been expanded considerably, and currently is in its fifth edition. His outstanding work was also presented in more than 30 international conferences, in the United States, Japan, South Korea, Germany, France, India, Poland, Egypt, etc.

Dr. Wang's remarkable accomplishments received high praise both nationally and internationally. He received awards from the State Council of China (1979, 1998, and 2005), Chinese Education Commission (1992), and Chinese Ministry of Health (1992). Dr. Wang also received a prestigious International award - the "History of Medical Ultrasound Pioneer" by the World Federation of Ultrasound in Medicine and Biology in 1988. In 2012, Dr. Wang was recognized as an Honorary Fellow of American Society of Echocardiography (FASE), the first Honorary FASE from China!

Dr. Xinfang Wang may be most remembered by the scores of trainees he mentored over the decades. He has trained many well-known echocardiographers in China who in turn train younger generations of echocardiographers. His famous four lines on scientific research are our motto, and will never be forgotten:

*To have a keen perspective,
To unite your team,
To respect your colleagues,
To treat your success as a team achievement.*

His legacy will live forever.



Dr. Xinfang Wang with Dr. Harvey Feigenbaum in an echo conference in France.



Dr. Xinfang Wang received a plaque of Honorary FASE, presented by Dr. Patricia Pellikka, the President of ASE, in 2012.

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.*