ECHO

VOLUME 9 ISSUE 1 **NOVEMBER 2020**

American Society of Echocardiography

ASE2021

A REVOLUTION IN CARDIOVASCULAR IMAGING

32nd Annual Scientific Sessions

June 18-21, 2021

Abstracts submission closes February 3

#ASE2021

ASEScientificSessions.org

ECHO

A MEMBER NEWS SOURCE

VOLUME 9, ISSUE 1 | NOVEMBER 2020

YOUR ASE WORLD.
Engaging. Informational. Entertaining.

Find this content online @ issuu.com/ase_echo

ABOUT ASE

The American Society of Echocardiography (ASE) is the Society for Cardiovascular Ultrasound Professionals™. Over 17,000 physicians, sonographers, nurses, veterinarians, and scientists are members of ASE, making it the largest global organization for cardiovascular ultrasound imaging and as such the leader and advocate, setting practice standards and guidelines for the field. Since 1975, the Society has been committed to advancing cardiovascular ultrasound to improve lives.

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.

COMMENT & CONTRIBUTE

Like what you read? Have an idea for a future article? We want to hear from you! Email: Echo@ASEcho.org.

Managing Editors

Deborah R. Meyer and Angie Porter

Staff Contributors

Sarah Beth Bdoyan and Christina LaFuria

Guest Contributors

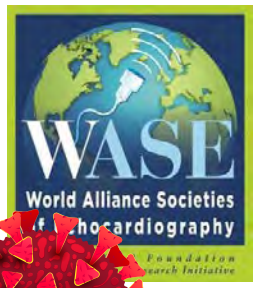
Federico M. Asch, MD, FASE, MedStar Health Research Institute, Washington, DC; Aaron Baggish, MD, FACC, FACSM, Massachusetts General Hospital, Boston, MA; Tiffany Chen, MD, FASE, Hospital of the University of Pennsylvania, Philadelphia, PA; Keith Collins, MS, RDCS, FASE, Northwestern Medicine, Chicago, IL; Sara Creighton, MD, Children's Hospital of Wisconsin, Milwaukee, WI; Ashlee Davis, BS, ACS, RDCS, FASE, Duke University Hospital, Durham, NC; Zabrina Duncan, RDCS, Scripps Clinic, La Jolla, CA; Peter Frommelt, MD, FASE, Children's Wisconsin, Milwaukee, Wisconsin; Regan E. Giesinger, MD, University of Iowa, Iowa City, IA; Amer M. Johri, MD, MSc, FRCPC, FASE, Queen's University, Kingston, Ontario, Canada; Ilya Karagodin, MD, University of Chicago, Chicago, IL; James N. Kirkpatrick, MD, FASE, University of Washington Medical Center, Seattle, WA; Arthur Labovitz, MD, FASE, FACC, FAHA, Naples Cardiac and Endovascular Center and Tampa General Hospital, Tampa, FL; Wyman Lai, MD, MPH, MBA, FASE, CHOC Children's Hospital, Orange, CA; Roberto M. Lang, MD, FASE, University of Chicago, Chicago, IL; Philip Levy, MD, Boston Children's Hospital, Boston, MA; Stephen H. Little, MD, FASE, Houston Methodist DeBakey Heart & Vascular Center, Houston, TX; Leo Lopez, MD, FASE, FACC, FAAP, FAHA, Stanford University School of Medicine, Palo Alto, CA; Michael L. Main, MD, FASE, Saint Luke's Mid America Heart Institute, Kansas City, MO; Laura E. Mantella, MSc, Queen's University, Kingston, Ontario, Canada; Tom Marwick, MD, PhD, MPH, Baker Heart and Diabetes Institute, Melbourne, Australia; Patrick J. McNamara, MD, University of Iowa, Iowa City, IA; Tatsuya Miyoshi, MD, MedStar Health Research Institute, Washington, DC; Alina Nicoara, MD, FASE, Duke University Medical Center, Durham, NC; Patricia A. Pellikka, MD, FASE, Mayo Clinic, Rochester, MN; Thomas R. Porter, MD, FASE, University of Nebraska Medical Center, Omaha, NE; Nishath Quader, MD, FASE, Washington University in St. Louis, St. Louis, MO; Lucy Safi, DO, FASE, Hackensack University Medical Center, Hackensack, NJ; Nikolaos Skubas, MD, FASE, Cleveland Clinic, Cleveland, OH; Madhav Swaminathan, MD, FAHA, MMCi, FASE, Duke University Health System, Durham, NC; Seda Tierney, MD, FAAP, FASE, FACC, FAHA, Stanford University School of Medicine, Stanford, CA; David H. Wiener, MD, FASE, Jefferson Heart Institute and Thomas Jefferson University, Philadelphia, PA; Neil J. Weissman, MD, FASE, MedStar Health and Georgetown University School of Medicine, Washington, DC

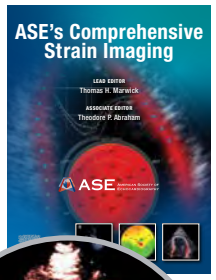
ASE MEMBERS:

ASE barely announced its new, five-year strategic plan (see graphic below) in February and then the world went upside down. The COVID-19 pandemic has affected every aspect of ASE, from converting our live courses and committee/board meetings to virtual events, to having all of our staff work remotely, to changing the way we proceed with our goal plans. Through the hard work of our volunteers and staff, we have re-grouped and focused strategically on areas that we can control and influence, issuing six COVID-19 guidance statements and eight webinars, holding virtual meet-ups like the "Women in Echo" event to foster career development, holding a virtual "Science Night" with our E21 researchers, and launching our ASE Learning Hub to accelerate our reach around the globe with lots of new educational offerings. Thanks for joining us on the journey to reach our new goal targets, especially as we will need to be flexible and evolve as new methods will be required to keep up with this ever-changing world.

Robin Wiegerink, CEO, MNPL

Contents





AMERICAN SOCIETY OF ECHOCARDIOGRAPHY

Meridian Corporate Center
2530 Meridian Parkway, Suite 450
Durham, NC 27713

ASEcho.org | ASEFoundation.org

Phone: 919-861-5574

Fax: 919-882-9900

FOLLOW US

Facebook.com/ASECHO

Twitter.com/ASE360

YouTube.com/ASE360

Instagram.com/ASE360

Pinterest.com/ASE360

Connect.ASEcho.org

American Society of Echocardiography

Cover art provided by Thomas Marwick, MD, PhD, MPH. Legend: Individual segmental waveforms in each apical view, and calculation of global longitudinal strain. Readers who are unsure about how to obtain this, or the need for the interpreting physician to review the waveforms, might be interested in the article on page 28 and the upcoming *ASE's Comprehensive Strain Imaging* textbook.

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.

Focus on LEADERSHIP

What is your *silver lining moment* to the adjustments you have had to make in 2020?

JUDY W. HUNG, MD, FACC, FASE
PRESIDENT, ASE
MASSACHUSETTS GENERAL HOSPITAL

If there is a silver lining to the COVID-19 crisis, it may be the degree to which it has reawakened the power of empathy during a time when things seemed to be getting pretty impersonal and divisive. When the pandemic hit it felt as if everyone just dropped everything and shifted into "how can I help?" mode. I was warmed by the sudden blossoming of cooperation, compassion, and selflessness as everyone I knew reoriented to engage the mounting human catastrophe. Once the crisis passes, I hope we find that it has left a crack in the crusty barriers that seemed to be steadily separating us. If that is the case, it will surely be a silver lining indeed.

Also, traffic has been really light, which is a real game-changer in Boston.

Raymond F. Stainback, MD, FACC, FASE

President-Elect, ASE
Texas Heart Institute

Cognizance of silver linings is an important tool for realizing happiness and resilience in the face of life's setbacks. Our generation has never experienced the likes of the COVID-19 pandemic which has brought silver linings into stark relief. In my world, I am thankful for several of these. In our hospital lab and across our facility the medical, nursing, technical, and administrative teams have worked together. We have created a safe, secure, and caring environment in the face of a common scourge. This hard and "in the trenches" shared work has increased trust, sense of mission, and esprit de corps that was previously sometimes lost in the shuffle. Although I have not seen any of my extended family in person since last Christmas, the miracles of modern communication have kept them close. Excluding underwear and socks, I have not needed to purchase any new clothes for many months or worry about dressing up. Time previously spent in airports, on planes, and attending countless in-person meetings has been traded for extended time in my garden. I have enjoyed saturated spring and summer experiences at my farm, and this used to feel crowded out. I routinely stay more caught up on daily tasks – my home is more organized and pleasant. The many silver linings are to be cherished. But, one person's silver lining is another's dread. For all who are tragically adversely affected, I am empathetic and praying for strong silver linings and your recovery with renewed hope and vigor, and I will do my part to provide and encourage support.

Stephen H. Little, MD, FACC, FASE

Vice President, ASE
Houston Methodist DeBakey Heart & Vascular Center

2020 has been a tough year for many people, and to find the silver lining within this dark cloud is not immediately obvious. However, I can think of two positive developments within these very challenging times. The first is the rapid dissemination and adoption of improved digital technologies such as the now ubiquitous video conferencing. In a new world of webcams and microphones the efficiency of communication between colleagues, our patients, and even our own families have to some extent changed – likely for good. These various video platforms have broken down or at least diminished some geographic or mobility barriers that have long existed. In the current era of social distancing and required isolation – I now sometimes actually look forward to the scheduled Zoom call, and waiting to see who will forget to mute when their dog barks.

Another positive outcome from these challenging times has been a renewed sense of teamwork and shared mission. Healthcare providers at every level have shouldered the burden during this pandemic. The demonstrated strength and resiliency I've witnessed from my colleagues has been truly remarkable. The common challenges of 2020 have solidified our team approach to patient care in an astonishing way. When we see colleagues today wearing face masks and face shields and layers of PPE, it's easy to recognize that we're all on the same team and all striving for a common goal – to deliver exemplary care during an extraordinary time.

Carol Mitchell, PhD, RDMS, RDCS, RVT, RT(R), ACS, FASE

Treasurer, ASE
University of Wisconsin School of Medicine and Public Health

For me, the silver lining in 2020 has been connection with family and friends. While the COVID-19 pandemic has changed the way we do things, it has given me a chance to explore new ways to connect with friends and family. I have found that in these strange times, I have actually reached out to more friends and family to see how everyone is doing using virtual platforms. These initial virtual meetings have fostered scheduled "connection times" and in some ways I am talking more with old friends than I have in years. In addition, with myself and my husband working from home, and my son going to school from home, we have been able to meet for lunch almost every day and catch up. We are connecting more frequently and appreciating each other even more. We also schedule time to meet with our extended family and are doing so on a regular basis – often leaving the question – why did we not do these things before? While we are all anxious to have things get back to the way they were, sometimes things need to slow down, and for me this has been a time to reconnect with many friends and family on a regular basis virtually.

Matt Umland, ACS, RDCS, FASE

Secretary, ASE
Aurora Health Care

Going into the healthcare field can be one of the most rewarding career choices one can make. The reward does not come without potential difficult times, such as during the COVID-19 pandemic.

Staying healthy on the job in this current pandemic can be quite difficult in the sense that our normalcy has changed, eating habits, exercise patterns are disrupted by closures or limitations. We need to make healthier choices which may not be the easiest choices. Long workdays may lure us to making poor choices in food and drinks. I plan each day to drink a set amount of water and have a balanced diet. The balanced diet requires me to pre-plan my meals and have the ingredients accessible so that I am not lured to stopping at a fast-food drive-thru on the way home. Making these changes to my diet allows me to feel more energetic and resilient.

This brings me to my next point regarding personal resilience, it is defined as the individual ability to withstand, adapt to, and recover from adversity and stress. It involves behaviors, actions, and thoughts that ultimately promote wellbeing and healthy mental status. This can appear at different levels and changes through life. I try to periodically assess what are my biggest distracters in life and set goals to reduce the impact. These distractors are ever changing and as we change in life, issues around us change, and becomes even more important to be aware. We can easily be steered down a wrong course if we do not reflect on our surroundings. I set aside time each day to reflect, assess the negative and positives and set goals if needed to overcome any negativity. Assessing these distracters and setting goals allows me a path to overcome and achieve, which ultimately leads me to overcome adversity and become personally more resilient.

In order to stay healthy and energetic, we all need to assess our current lifestyles and ask ourselves "is this the lifestyle I want." Make the changes, believe in yourself, be optimistic, and a motto I like to use and share, "Everyone should have at least one good laugh per day."

Meryl S. Cohen, MD, MSED, FASE, FACC, FAHA

Council Representative, ASE
Children's Hospital
of Philadelphia

Despite all of the struggles for all of us trying to figure out how to get through the day in a pandemic I would say there have been several positive aspects of the past year that I am grateful for. At home, I have been able to spend more time with my immediate family. Two of my children moved back in for a time and we all have dinner together every night, a gift I would not have had otherwise. And my other son got engaged during the pandemic! The pandemic has also made me prioritize what is important including working to stay fit and healthy, keeping in touch with friends and extended family, and being grateful that I have a good job. At work, the pandemic has led to many international teaching opportunities I would not have had otherwise. It has also resulted in tremendous teamwork and camaraderie amongst my colleagues and trainees. Everyone has stepped up to work together to keep our patients and their families safe. Though I would never have wanted a pandemic to occur, it has aligned my priorities and made me take notice of my surroundings in a way I might have missed otherwise.

The word "adjustments" is something the entire human race has had to deal with in 2020. As if there weren't enough issues surrounding us, a pandemic forced its way into our lives early this year, prompting dramatic changes to our way of life, forcing us to adjust. Not too long before the pandemic struck, provider burnout was one of our biggest concerns. Then this viral scourge came roaring in.

Perhaps the most visible of changes for most of us has been the shift to "virtual" meetings, social distancing, and the use of personal protective equipment. For me, the one "adjustment" that has led to several silver lining moments has been prompted by the complete cessation of professional travel. While traveling was always something I looked forward to, especially exploring new places, cultures, foods and meeting new people, the time spent waiting at airports, riding in taxis, staying at hotels and spending time away from family were major dissatisfiers. Suddenly, all meetings went virtual and I was able to spend so much more time with my family! I rediscovered a love for cooking, running outdoors, and binge-watching movies with my wife. I was also able to attend more meetings, make more efficient use of my time, and hone my presentation skills in front of a camera rather than an audience!

While we have learned new words and use phrases we never did before February of this year, we have also realized what is truly essential – the people around us.

Madhav Swaminathan, MD, FAHA, MMCI, FASE

Immediate Past President, ASE
Duke University
Health System

ECHO IN THE TIME OF COVID

CONTRIBUTED BY:
ASHLEE DAVIS, BS, ACS, RDCS, FASE, CHIEF TECHNOLOGIST, CARDIAC DIAGNOSTIC UNIT, DUKE UNIVERSITY HOSPITAL, DURHAM, NC AND KEITH COLLINS, MS, RDCS, FASE, LEAD CARDIAC SONOGRAPHER-NEW TECHNOLOGY, NORTHWESTERN MEDICINE, CHICAGO, IL

"Stay fluid."

This was advice given by one physician as he was talking about the ever-changing time we are in. "Stay fluid" meaning to be adaptable, go with the flow, stay flexible. To us, this epitomizes the sonographer's response to COVID-19. We have been adapting to an ever-changing working environment, learning new protocols, shifting our focus to the echo essentials, learning new PPE processes, social distancing, cleaning the daylights out of everything, etc., all while dealing with our own stressors outside of work. We are essential. We have always been essential, to our patients, to our coworkers, to our hospitals and clinics.

Never has that phrase held so much weight as it does during a global pandemic. We HAD to show up, but HOW we responded was all up to us. A few words that came to mind as we thought back on the past few months in the echo community were: Commitment, Compassion, Flexibility, and Perseverance.

COMMITMENT

As healthcare workers, we made a commitment, a commitment to our patients and to our profession. Sonographers have proven this commitment over and over again as we

Sonographer Abby Payne (Aurora Health, Milwaukee, WI) demonstrates the draping of the echo machine and PPE worn while imaging COVID-19 patients.

continue to show up, day after day. We have been asked to do things that may not be a part of our usual work routine, but we showed up because we are dedicated. At the beginning of the pandemic, as it moved into each of our cities and hospitals in one form or another, things started changing. We were unsure of what the future would hold, whether our patients would be infected, whether we would contract the virus or worse, bring it home to our families or immunocompromised community members.

Still, we showed up. Often showing up to work meant that you didn't know exactly what the day would look like, going where the need was greatest whether that be the temp pool, screening patients or employees as they came into the hospital, watching as people don and doff PPE and making sure they are appropriately protecting themselves, or even delivering PPE to other areas of the hospital. We went where we could make the biggest impact.

One of the most impactful areas where we showed our commitment to the profession was through educating and training point of care ultrasound (POCUS) users in various areas of the hospital. Luckily, the sonography community had already been well on its way to embracing POCUS, developing training programs, protocols, and even developing AI software to improve imaging for novice users (Recommendations for Echo Labs Participating in Cardiac POCUS and CCE Training, Kirkpatrick et. al. JASE April 2020).

Increasing the use of POCUS served two very important purposes in the COVID-19 environment:

1. **To put real-time cardiac assessment in the hands of frontline providers, so that they are able to treat these patients quickly and effectively; and**
2. **To protect sonographers by reducing exposure time, to only when sonographer expertise is absolutely needed.**

COMPASSION

Compassion is a cornerstone of the sonography profession. We care about our patients, and that translates into the way we interact with them, as well as our focus on quality imaging. One of the most heartbreaking things about the COVID-19 pandemic is the necessary visitor restrictions hospitals had to implement to protect patients, visitors, and employees. This created an isolating environment for almost all patients but especially for our COVID-infected patients.

Often frontline caregivers were the only faces (masks and all) that these patients saw for weeks or months at a time. When a coworker was approached and asked how he feels about scanning a COVID-positive patient, he said, "I love to scan these patients because I feel for them and how isolated they are; they need to see a friendly face." As close as we are physically to these patients, we really have an opportunity to make them feel cared for and connected to another human being.

Caring for our patients is not the only place sonographers have shown their compassion. Compassion was shown in the form of taking extra shifts while colleagues who are older or immunocompromised stay home to stay safe or volunteering to scan COVID-positive patients. We have also protected each other by ensuring isolation guidelines are followed, practicing social distancing, and masking when around each other.

In the midst of this global health crisis, frontline workers have been acknowledged worldwide for their work. Doctors and nurses

are most often mentioned, along with technicians, waste personnel, police, paramedics, and restaurant and grocery workers.

As essential workers, we sonographers feel a greater good for the patient care we provide and mutual respect for other essential workers. On two April mornings, Chicago police lined the designated entry for Northwestern Hospital, and cheered all hospital staff entering for their shift. We were equally as appreciative and humbled by their work during these difficult times.

When celebrities, politicians, patients, and others commend essential workers, we know we are part of a collective team to better understand how this virus affects our patients' health and daily lives.

FLEXIBILITY

Flexibility has been an absolute necessity for sonographers during the pandemic. We have all seen a change in our daily workload, and some of us have even had our hours significantly cut. Our protocols have changed from the extensive full protocol we are used to, to a more streamlined but still thorough exam. Using the ASE recommendations for protecting patients and echo providers (https://www.asecho.org/ase-statement-covid-19/), we all have one goal for the echo community: getting as much useful information as possible, with as little exposure as possible.

Many echo labs have implemented limited studies or POCUS studies followed by official echocardiograms when needed. In many ways this change has actually forced institutions to allow sonographers to do what we do best: think on our feet, and know what images can tell the story as succinctly as possible without wasting time.

We have had to learn new isolation and PPE recommendations as protocols and PPE supplies change. In some facilities, healthcare workers are dealing with PPE shortages and are having to be creative with solutions to these problems. Sonographers have adapted by using smaller handheld or laptop machines which are easier to clean and allow them to get information quickly and efficiently. We have, in many areas, adjusted our workflow to reduce exposure, limit patient-to-patient interactions, and comply with the Centers for Disease Control and Prevention (CDC) and local/institutional guidelines.

In doing this, the sonographer exposure and contraction of the virus has been overall very low. In our institutions, as of mid-September, the healthcare positive rate of COVID-19 is less than 4% (compared to a rate of 8% for the general population) with zero positive cases among reported sonographers. We believe this speaks to our steadfastness in complying with guidelines and protecting ourselves and each other.

With ASE guidance (ASE Statement on the Reintroduction of Echocardiography Services During the COVID-19 Pandemic, Hung et. al. JASE, August 2020), many labs across the country are bringing back "non-urgent" patients while balancing timing, scheduling, social distancing, and personal protective equipment. One of the biggest challenges we are facing as we care for patients who were pushed back during the peak of the pandemic, is how to continue to keep patients and one another healthy and safe. We adhere to restrictions about social distancing (both staff and patients), waiting room limits, mask mandates, etc. As more patients return, safety remains our highest priority.

Sonographers have always been extremely flexible, on-their-feet thinkers, but this pandemic showcased just how adaptive we can be.

SONOGRAPHER JEFF GRAHAM (DUKE UNIVERSITY) USES A TABLET ULTRASOUND MACHINE TO SCAN A PATIENT WHILE WEARING PERSONAL PROTECTIVE EQUIPMENT.

PERSEVERANCE

Even with "COVID fatigue," sonographers have displayed incredible amounts of perseverance. Often, we have pushed through the difficulties and limitations to fight for the best images and studies for our patients. Sonographers have continually provided resources, guidelines, and even mental health support for fellow community members.

Formal recommendations for echocardiography users were developed, written, and published at lightning speed in order to get needed information out to the echo community. The ASE COVID resource page (https://www.asecho.org/covid-19-resources/) has been continually updated with necessary content to keep us informed. Multiple ASE webinars have been developed and presented by and for sonographers (https://www.youtube.com/watch?v=T8AktdbozOQ), notably one titled "Specific Considerations for Sonographers When Performing Echocardiograms During the 2019 Novel Coronavirus Outbreak" (https://www.youtube.com/watch?v=JF16yma-AoM&feature=youtu.be).

The recent ASE 2020 Virtual Experience Scientific Sessions even featured a COVID-19 session with case studies exploring the effect of COVID-19 on the heart. As we continue to learn more of this virus' cardiovascular effects, sonographers and serial echos will continue to provide data for greater understanding.

In addition to technical resources during the COVID-19 pandemic, ASE has also compiled many mental health resources to help sonographers cope with the stress of working and living in a pandemic. The ASE Cares Wellness Center (https://www.asecho.org/covid-19-resources/ase-wellness-center/) is a great resource for sonographers and other clinicians alike. ASE has curated a collection of articles, mental health resources, virtual fitness options, meditation recommendations, and fun activities.

In our labs, we chose to incorporate some of these things to help maintain positive mental health through the crisis including Zoom get-togethers, wellness Wednesday lunch breaks, mental health surveys, and a support phone tree. Staying connected and supporting each other, while we are caring for others, is vital to increasing our personal resilience.

CONCLUSION

The COVID-19 global pandemic of 2020 is sure to be a period in time that none of us will forget. While we remember the lockdown, virtual schools, never-ending Zoom meetings, drive-by birthday parties, and social distancing, may we also remember the commitment, compassion, flexibility, and perseverance of sonographers. It is with admiration and pride that we recall how we continually cared for patients in the most difficult of times. The collaboration and respect we share with our physician partners has never been so demonstrated as during the pandemic while we worked together to find best practices for providing quality patient care while protecting ourselves and one another.

We sought guidance from ASE on who, where, and how to image our patients. We can be proud of how we adapted quickly and came together in novel ways to continue to provide top notch imaging and quality patient care.

HELPFUL RESOURCES

- ASE Coronavirus (COVID-19) Resources: https://www.asecho.org/covid-19-resources/
- ASE Statement on COVID-19. J. Kirkpatrick, et. al.: https://www.asecho.org/ase-statement-covid-19/
- ASE Cares Wellness Center: https://www.asecho.org/covid-19-resources/ase-wellness-center/
- ASE Statement on the Reintroduction of Echocardiography Services During the COVID-19 Pandemic. J. Hung, et. al.: https://www.asecho.org/wp-content/uploads/2020/05/ASE-Reintro-Statement-FINAL.pdf
- Specific Considerations for Sonographers When Performing Echocardiography During the 2019 Novel Coronavirus Outbreak. C. Mitchell, et. al.: https://www.asecho.org/wp-content/uploads/2020/06/COVID-Sonog_June-2020.pdf
- ASE Statement on Point-of-Care Ultrasound during the 2019 Novel Coronavirus Pandemic. A. Johri, et. al.: https://www.asecho.org/wp-content/uploads/2020/06/COVID-POCUS_June-2020.pdf
- CDC: Information for Healthcare professionals about Coronavirus (2019): https://www.cdc.gov/coronavirus/2019-ncov/hcp/index.html
- World Health Organization: https://www.who.int/emergencies/diseases/novel-coronavirus-2019

ASE LEADERSHIP ACADEMY HELPING ELEVATE LEADERS IN ECHOCARDIOGRAPHY

Contributed by: Neil J. Weissman, MD, FACC, FASE, Chief Scientific Officer, MedStar Health and Professor of Medicine, Georgetown University School of Medicine, Washington, DC

ASE is committed to the professional growth of its members, a dynamic volunteer leadership team, and continued investment in our Society's future. The ASE Leadership Academy brings together all of these goals. Fourteen members of the inaugural Leadership Academy graduated this summer. Over the past two years, this group of early to mid-career ASE members gained not only a deep understanding of essential leadership skills and attributes, but also practiced that knowledge through ASE volunteer positions and in their own professional and personal lives. During the program, the group worked through different education modules on topics such as conflict resolution, strategic thinking, practical change management, marketing for physicians, and trust. Leadership Academy participants were also matched with a senior ASE advisor whom they interacted with regularly. Peer-to-peer learning on video calls and face-to-face meetings were helpful in establishing meaningful relationships within the class that will span years to come. The group developed a very close connection over the past two years and has been actively applying their new leadership knowledge and skills within ASE and at their home institutions; in fact, approximately half the class has taken on new or expanded leadership roles since starting the program!

Sangeeta B. Shah, MD, FASE, who was at Ochsner Heart and Vascular Institute while she was a member of the first ASE Leadership Academy class, and is now in a new leadership role as Director, Adult Congenital Heart Clinic, Medical College of Virginia School of Medicine, said, "This cohort was a diverse group of people with a common passion for imaging. This group was a great resource as we shared vulnerable experiences and learned from each other. It will be interesting to see what this group can accomplish together in the future."

The ASE Leadership Academy premiered in the fall of 2018 to support ASE members with leadership aspirations who had shown a commitment to cardiovascular ultrasound and ASE. The program was created to mentor and train future leaders who would benefit from the program in such a way that their professional growth would include an increasing contribution to ASE over the next 15-20 years. The ASE Board of Directors is dedicated to providing educational opportunities and connections while fostering effective leadership for the organization and the field.

Many class members have experienced significant achievements that they attribute at least partially to their experience and learning in the Leadership Academy program. All three sonographer members in the group were promoted to leadership management positions during this time. Kristen Billick, BS, ACS, RDCS (AE, PE), FASE, is now Echo Lab Manager at Scripps Clinic in California. She said about being offered the Echo Lab Manager position, "I wasn't yet 100% convinced that I was ready to take on

the manager position...and that's where the encouragement from my Leadership Academy advisor, Peg Knoll, came into play. She shared the pros and cons of being an Echo Lab Manager. I'm almost one year into having accepted the Manager position, and I've been tested more now than I ever imagined. COVID-19 has literally rocked my whole leadership world... The Leadership Academy has given me the organizational people skills I needed to work with all of the employees during this time."

Other Leadership Academy members have been elected to positions on Boards of Governors and Boards of Directors for professional organizations, as well as the new ASE Foundation Board of Directors. One member, Enrique Garcia-Sayan, MD, FASE, was promoted to Director of Cardiovascular Imaging and Co-Director of Cardiology at University of Texas Health Science Center at Houston. Another Leadership Academy graduate, Dermot Phelan, MD, PhD, FASE, became the Director of Cardiovascular Imaging at Atrium Health, as a direct result of relationships built with his ASE Senior Advisor through this program.

After the graduation of the first cohort, the organization's open nomination process was conducted garnering a large number of submissions. The second cohort of 15 ASE members, representing all areas of ASE membership, was selected from a pool of 50 highly qualified and talented applicants. This new group is remarkably diverse, including its first international member. This cohort will spend 19 months in training to increase their knowledge and develop skill sets that will help them be successful leaders throughout their careers.

After a very competitive selection process, we are thrilled to have another stellar group of physicians and sonographers dedicated to advancing their careers and the field of cardiovascular ultrasound. The first cohort of the Leadership Academy set the bar very high. We are very proud of their accomplishments and their ongoing commitment to ASE. This second cohort is a very diverse group, with talents and interests that connect the membership of ASE today to the potential areas of growth for tomorrow. I could not be more excited to get started!

ASEcho.org/LeadershipAcademy

2020-2022 ASE Leadership Academy

Daniel Bourque, MS, RCS, FASE, Orlando Regional Medical Center, Lakeland, FL

Sujatha Buddhe, MD, FASE, Seattle Children's Hospital, Seattle, WA

Patrick Collier, MD, PhD, FASE, FESC, FACC, Cleveland Clinic, Cleveland, OH

David Dudzinski, MD, FASE, Massachusetts General Hospital, Boston, MA

Abimbola Faloye, MD, FASE, FASA, Emory Healthcare, Atlanta, GA

Daniel Forsha, MD, MCS, FASE, Children's Mercy Kansas City, Kansas City, MO

Madeline Jankowski, BS, RDCS, FASE, Northwestern Memorial Hospital, Chicago, IL

Noreen Kelly, MD, MBA, FASE, Sanger Heart and Vascular Institute, Charlotte, NC

Juan Lopez-Mattei, MD, FASE, University of Texas MD Anderson Cancer Center, Houston, TX

Marcelo Miglioranza, MD, PhD, FASE, Instituto de Cardiologia do Rio Grande do Sul - ICFUC, Porto Alegre-RS, Brazil

Matthew Parker, MD, FASE, UMass Memorial Medical Center, Worchester, MA

Nina Rashedi, MD, FASE, Mayo Clinic, Rochester, MN

Richard Sheu, MD, FASE, University of Washington Medical Center, Seattle, WA

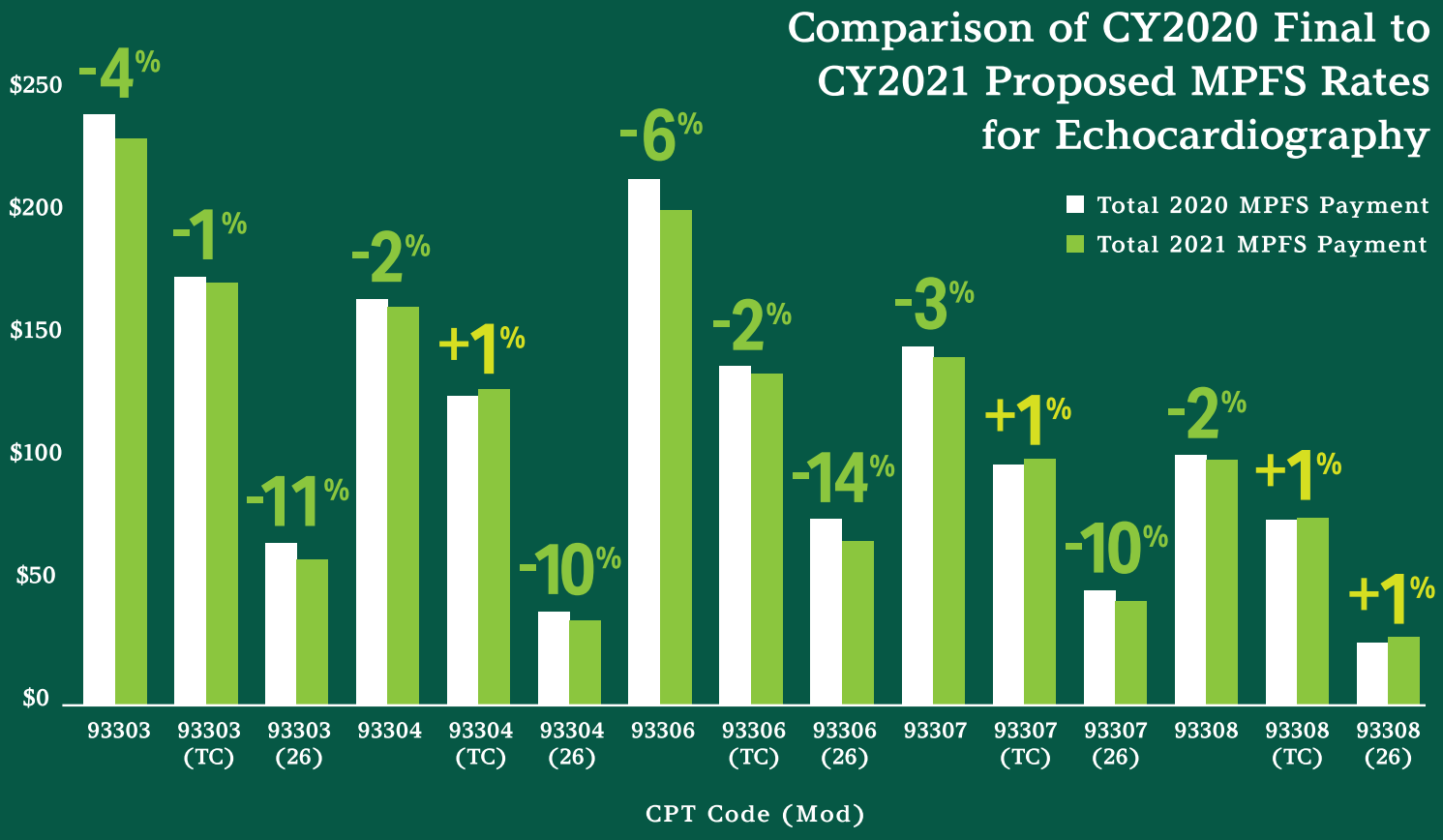
Matthew Vorsanger, MD, FACC, RPVI, FASE, Weill Cornell Medicine, New York, NY

Melissa Wasserman, RDCS, RCCS, FASE, Children's Hospital of Philadelphia, Philadelphia, PA

2021 Physician Fee Schedule Conversion Factor Decreasing to $32.41, which is 10.2%.

CMS is proposing **reductions payments to nearly all services** primarily driven by new Medicare payment policies for office and outpatient visits or evaluation and management (E/M) codes and a budget neutral requirement.

The following demonstrates the impact to some of the more commonly used echo codes.



Large-Scale E&M Coding Changes Coming January 1, 2021

Beginning January 1, 2021, it will be important for you to bill your E/M level of service to comply with these new policy changes. Key elements of the E/M office-visit overhaul include:

- Eliminating history and physical exam as elements for code selection. While significant to both visit time and medical decision-making, these elements alone should not determine a visit's code level.
- Allowing physicians to choose whether their documentation is based on medical decision-making or total time. This builds on the movement to better recognize the work involved in non-face-to-face services like care coordination.
- Changing medical decision-making criteria to move away from simply adding up tasks to instead focus on tasks that affect the management of a patient's condition.

Learn more at: ASEcho.org/Advocacy

2020

A BANNER YEAR FOR ASE GUIDELINES

Contributed by: David H. Wiener, MD, FASE, Clinical Professor, Director of Clinical Operations, Jefferson Heart Institute, Thomas Jefferson University, Philadelphia, PA and Chair, ASE Guidelines and Standards Committee

ASE is the leader in meeting the educational needs of the cardiovascular ultrasound community. One approach is through our guidelines, which evaluate the evidence about the subject and give uniformity to the practice of echocardiography. They are regarded as the authoritative resource on cardiovascular ultrasound, are translated into many languages, and referred to worldwide. Two thousand and twenty is a banner year for ASE's Guidelines and Standards (GS) Committee, with a record six documents across many facets of cardiovascular ultrasound. Credit goes to my predecessor as GS chair, current ASE Vice President Stephen H. Little, MD, FASE, and to recently retired ASE Chief Standards Officer, Rhonda Price, who oversaw this endeavor for many years.

ASE publishes focused and concise guidelines, containing formal recommendations in clearly summarized lists, tables, or figure formats. Guidelines include key points for each section, in the form of a bulleted summary of important topics which are the "whys" behind the recommendations. They are written as modular documents to allow "chunked" learning and are richly illustrated for presentation across multiple media platforms.

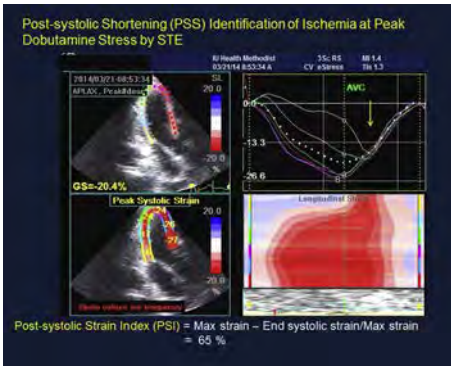
A typical guideline takes a year to produce from time of proposal and approval, through convening a balanced and diverse group of subject experts, under the guidance of a chair and co-chair who are responsible for carrying the guideline to fruition. Each document is reviewed and critiqued by members of the GS committee, and the revised version receives final approval by the ASE Board of Directors. The guideline process is summarized in the graphic below.

As ASE's 2020-2021 GS Committee chair, it is my privilege to represent our members in this mission-critical task, together with co-chair David A. Orsinelli, MD, FASE, and Lisé Blandino, MS, ASE's Vice President of Science and Clinical Guidelines. We look forward to working with members to advance the field.

JANUARY 2020

Guidelines for Performance, Interpretation, and Application of Stress Echocardiography in Ischemic Heart Disease

Contributed by: Patricia A. Pellikka, MD, FASE, Vice Chair, Department of Cardiovascular Medicine, Mayo Clinic, Rochester, MN

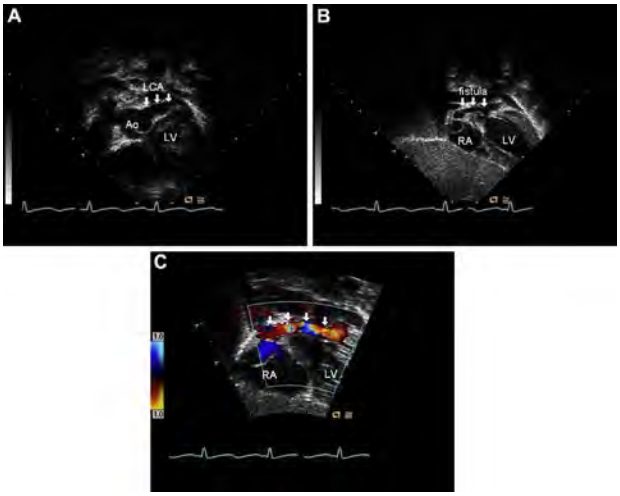


ASE's 2020 stress echocardiography guidelines provide a comprehensive update regarding stress echo methodology, safety, appropriateness of testing, prognostic value, and comparison with other modalities for assessment of known or suspected myocardial ischemia. The document also describes the application of stress echo to children and young adults with conditions that place them at risk for having myocardial ischemia.

In particular, these guidelines provide detailed information regarding the use of ultrasound image enhancing agents, both for endocardial border detection and assessment of myocardial perfusion. These agents can increase the sensitivity of testing for the detection of ischemic heart disease. The guidelines also provide an expanded role for bicycle stress echocardiography, which allows evaluation of various Doppler parameters as well as left ventricular global and regional function during various stages of stress and during peak stress. The guidelines also include expert description of the utility of quantitative parameters to be applied during stress echocardiography. In particular, global and segmental strain assessment of the left ventricle can be used to complement regional wall motion assessment. These quantitative parameters provide a substrate for ongoing development of machine learning analysis of stress echocardiography.

Stress echocardiography remains the most versatile test for evaluation of patients with known cardiac disease or symptoms of suspected cardiac origin. In addition to accurate assessment of ischemia, many other causes of cardiac symptoms can be detected.

ASEcho.org/Guidelines



MARCH 2020

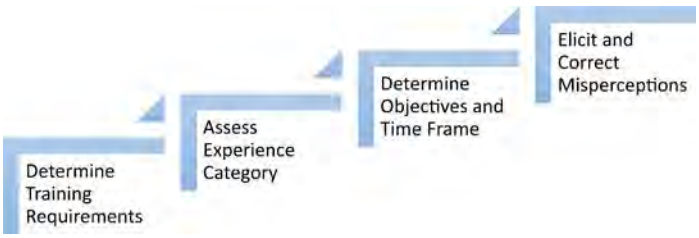
ASE Guidelines for Recommendations for Multimodality Assessment of Congenital Coronary Anomalies

Contributed by: Peter Frommelt, MD, FASE, Professor of Pediatrics, Medical College of Wisconsin, Pediatric Echocardiography Lab Director, Children's Wisconsin, Milwaukee, Wisconsin

Congenital coronary artery anomalies, both in isolation and associated with other forms of congenital heart disease, have been recognized as important lesions with significant potential morbidity and mortality, including sudden cardiac death in children and adolescents. This document provides multimodality guidelines for optimization of imaging for congenital coronary anomalies using echocardiography, cardiac computed tomography, cardiac magnetic resonance imaging, nuclear myocardial perfusion imaging, and angiography. The guidelines are designed to help the reader:

1. **Recognize the different anatomic variations of coronary origin and course when congenital coronary anomalies are present.**
2. **Understand the benefits and limitations of different imaging techniques in diagnosing congenital coronary anomalies.**
3. **Describe appropriate imaging strategies for characterization of congenital coronary anomalies when the coronary anomaly is in isolation, including anomalous aortic origin of a coronary artery, anomalous left coronary from the pulmonary artery, and coronary artery fistulas.**
4. **Describe appropriate imaging strategies for characterization of congenital coronary anomalies when the coronary anomaly is associated with other forms of congenital heart disease, both pre- and postoperatively, including supravalvular aortic stenosis, transposition of the great arteries, tetralogy of Fallot, truncus arteriosus, pulmonary atresia with intact septum, and hypoplastic left heart syndrome.**

This guideline was developed in collaboration with the Society for Cardiovascular Angiography and Interventions, the Japanese Society of Echocardiography, and the Society for Cardiovascular Magnetic Resonance, and has also been endorsed by 17 ASE International Alliance Partners.



APRIL 2020

Recommendations for Echocardiography Laboratories Participating in POCUS and Critical Care Echocardiography Training

Contributed by: James N. Kirkpatrick, MD, FASE, Professor of Medicine and Bioethics and Humanities (adjunct), Director, Echocardiography, Section Chief, Cardiovascular Imaging, Division of Cardiology, Chair, Ethics Committee, University of Washington Medical Center, Seattle, WA

Cardiac point of care ultrasound is found in emergency departments, pre-operative settings, clinics, wards, and ICUs. Inexpensive, small devices employed by a growing variety of users provide actionable information. As cardiac ultrasound experts, echocardiographers and sonographers are asked to participate in training practitioners from outside the cardiovascular field. These trainees' backgrounds, needs, and available time create challenges and opportunities. This document provides expert, practical guidance for echocardiography laboratories with the goal of training partners in the provision of high-quality care.

The document recommends that echo labs:

1. **Identify Trainee Needs**
2. **Employ Educational Resources**
3. **Avoid Certifying Global Competency**
4. **Count the Cost in Echocardiography Laboratory Resources**
5. **Advocate for Resources to Meet Extra Needs**

Importantly, training curriculum and duration should meet individual trainee needs. Some may require only a few weeks to learn ultrasound assisted physical exam, whereas critical care echocardiography practitioners should spend two to three months on a dedicated rotation. All trainees should participate in refresher experiences and quality assurance programs; studies show that skills atrophy if not used. Exposure to relevant pathology is key, with the recognition that number of scans does not necessarily convey competence. Importantly, trainees should understand the limits of cardiac ultrasound, of their devices, and of their own training experience, compared to full feature echocardiography.

Furthermore, labs must "count the cost." Personnel, space, machines, PACS resources, technical expertise, oversight capacity, quality assurance resources, and adequate case mix may be lacking, particularly in the COVID era. Echocardiography lab directors and others may need to advocate for additional resources, including money, staff time, machines, and educational materials.

Submitted for Review
Simultaneous Review by Guidelines Committee and Board of Directors (optional)

Writing Group Responses/ Revisions re Review Comments

Final Approval by Board of Directors

Submit to JASE

MAY 2020

Recommendations on the Use of Multimodality Cardiovascular Imaging in Young Adult Competitive Athletes

Contributed by: Aaron Baggish, MD, FACC, FACSM, Associate Professor of Medicine, Harvard Medical School, Director, Cardiovascular Performance Program, Massachusetts General Hospital, Boston, MA

The *ASE/SCCT/SCMR Recommendations on the use of Multimodality Cardiovascular Imaging in Young Adults Competitive Athletes* was written to provide a comprehensive overview of how to apply and interpret non-invasive cardiovascular testing in the care of this unique patient population. The document addresses the following three important issues.

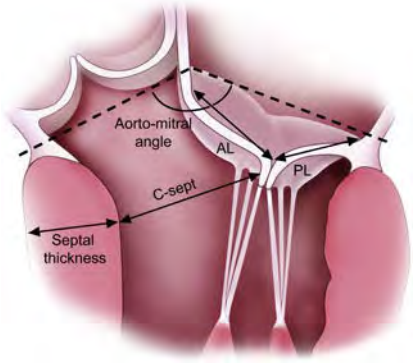
First, the hemodynamic demands of high intensity/high volume exercise stimulate numerous cardiovascular adaptations that vary as a function of sport type. These adaptations are commonly encountered by clinical imagers and may be challenging to differentiate from common forms of heart disease. In practice, differentiating benign adaptation from mild forms of cardiomyopathy requires an understanding of the expected or anticipated adaptations for any given athlete.

Second, the document addresses common imaging findings that present a diagnostic dilemma among young competitive athletes, including thickening of left ventricular walls, dilation of both the right and left ventricular chambers, and apical hyper-trabeculation. An algorithm for determining when these findings are physiologic versus pathologic coupled with a differential diagnosis for each finding is provided.

Finally, the document addresses the most common clinical scenarios in which noninvasive cardiovascular imaging serves an important role in the management of young competitive athletes. Recommendations regarding test selection and interpretation for scenarios including symptomatic athletes and preparticipation screening are provided.

JUNE 2020

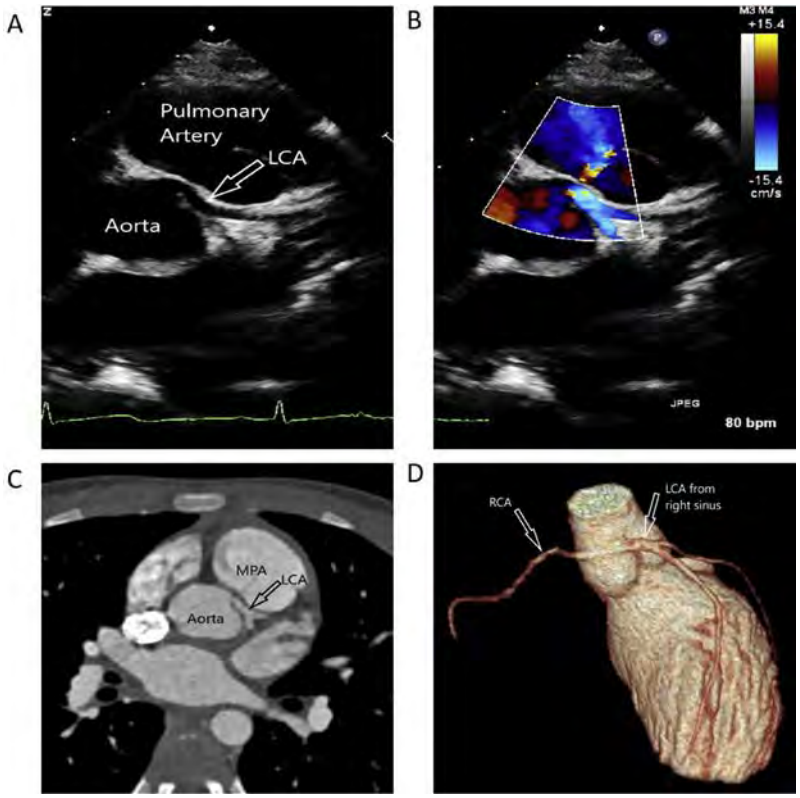
Guidelines for the Use of Transesophageal Echocardiography to Assist with Surgical Decision-Making in the Operating Room: A Surgery-Based Approach



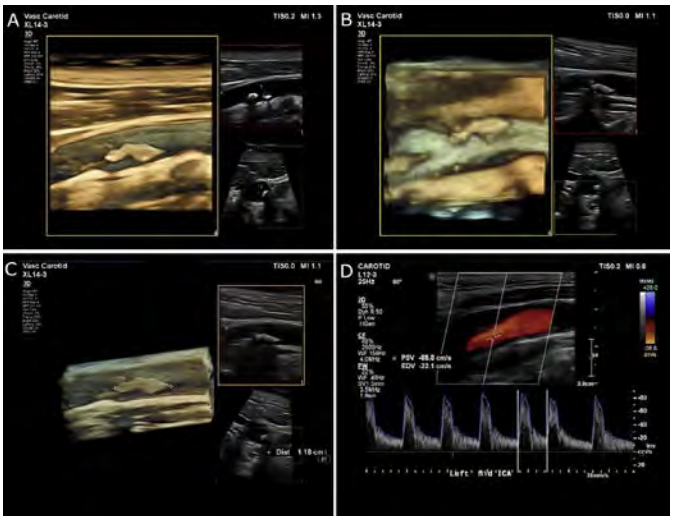
Contributed by: Alina Nicoara, MD, FASE, Associate Professor of Anesthesiology, Director, Perioperative TEE Services, Duke University Medical Center, Durham, NC and Nikolaos Skubas, MD, FASE, Department of Cardiothoracic Anesthesiology, Cleveland Clinic, Cleveland, OH

Intraoperative transesophageal echocardiography (TEE) is a versatile diagnostic and monitoring tool used to assist in patient management in a wide range of cardiac surgical procedures. The new document, *Guidelines for the Use of Transesophageal Echocardiography to Assist with Surgical Decision-Making in the Operating Room: A Surgery-Based Approach*, outlines a systematic approach on how to apply the existing guidelines to address questions on cardiac structure and function specific to the intraoperative environment in open, minimally invasive, or hybrid procedures. This peer-reviewed guideline was developed in collaboration with the Society of Cardiovascular Anesthesiologists and the Society of Thoracic Surgeons, and has also been endorsed by 18 ASE International Alliance Partners.

The purpose of intraoperative TEE is to confirm and/or refine the indications and planning for surgical intervention. For surgical decision making, TEE imaging is focused but also comprehensive and repetitive, and findings are communicated in real time to the surgical team.



The intraoperative echocardiographer should be an integral and active part of the heart team. Utilizing a 'catch-all' protocol as a starting point for imaging in all procedures and all patients enables standardization of image acquisition, reduction in variability in quality of imaging and reporting, and ultimately, better patient care. Equally important is the need for an informed understanding of the technical steps of the surgical procedures being performed and the complications that may occur, in order to direct the postprocedure evaluation toward aspects directly related to the surgical procedure and to provide pertinent echocardiographic information. Clear communication of the echocardiographic findings to the surgical team, as well as understanding the impact of new findings on the surgical plan, are paramount.



AUGUST 2020

Recommendations for the Assessment of Carotid Arterial Plaque by Ultrasound for the Characterization of Atherosclerosis and Evaluation of Cardiovascular Risk

Contributed by: Laura E. Mantella, MSc, MD/PhD student and Amer M. Johri, MD, MSc, FRCPC, FASE, Director of the Cardiovascular Imaging Network, Queen's University, Kingston, Ontario, Canada

The *Recommendations for the Assessment of Carotid Arterial Plaque by Ultrasound* contain a wealth of information on the incorporation of vascular ultrasound into cardiovascular risk assessment. This article highlights the **top three takeaways** from the guidelines:

1. **Carotid arterial plaque is defined as any focal thickening encroaching into the lumen or a carotid intima-media thickness (IMT) of > 1.5 mm.** The guidelines highlight a novel *Plaque Grading Consensus* that standardizes plaque measurements and can be used to risk-stratify patients. The grades range from ASE Grade 0 (no plaque, IMT <1.5 mm) to ASE Grade III (protuberant or diffuse plaque > 2.5 mm).
2. **Carotid plaque quantification includes 2D (plaque score, plaque height/thickness, plaque area) and 3D (plaque volume) ultrasound techniques.** Plaque score evaluates the total number of plaques in relevant carotid artery segments, whereas plaque height and area are measured using standard ultrasound software. Of the 2D techniques, plaque height is the preferred approach given its simplicity and accuracy. 3D volumetric ultrasound quantification is preferred when available for either optimizing plaque height or obtaining plaque volume.
3. **Asymptomatic low and intermediate risk patients should undergo a focused carotid ultrasound and subsequent 2D or 3D plaque quantification.** A cardiovascular risk stratification pathway is highlighted in the guidelines. Carotid plaque quantification and grading allows for re-classification of low and intermediate risk patients. In patients re-classified as "intermediate risk," further studies to assess plaque and patient vulnerability, such as plaque neovascularization and echolucency, may be considered.

Overall, these guidelines provide a framework for grading carotid atherosclerotic plaque to facilitate comparison across studies and monitoring of patient outcomes.

ASEcho.org/Guidelines

COVID-19, Echo, and You

CONTRIBUTED BY: MADHAV SWAMINATHAN, MD, FAHA, MMCI, FASE, VICE CHAIR FOR FACULTY DEVELOPMENT, DUKE ANESTHESIOLOGY, AND PROFESSOR OF ANESTHESIOLOGY, DUKE UNIVERSITY SCHOOL OF MEDICINE, DURHAM, NC

Perhaps one of the most frequently used words since February 2020 (other than "COVID" and "pandemic") is *unprecedented*. Although we have likely become immune to its true meaning, it accurately describes ASE's COVID response to its members' needs. It is interesting to note that when ASE released its first COVID guidance statement on March 18th, the U.S. saw its total number of COVID-19 cases just cross 6,000 and deaths surpass 100. These numbers seem unfortunately miniscule compared to the data we now see across the U.S. and the world – just a few months later.

Our volunteer members responded quickly with great enthusiasm to help develop a guide that focused on safety for our patients and echocardiographers alike. Statements were based on best available data, experience among centers with a high number of cases, and input from experts in infectious diseases. It is also important to note that none of these statements received the usual vetting process reserved for traditional ASE guidelines. The Society's leaders stepped up during this time, created a 'fast track' process specifically for COVID-related statements, and vetted documents at a record pace, recognizing the urgent need of our members to practice their craft safely. We also hosted webinars for all echocardiographers around the world to learn from each other with shared experiences. Webinars were held for each individual statement with a panel of experts that included statement authors. Simultaneous efforts focused on advocacy for echocardiographers and provision of personal protective equipment.

Our efforts were guided by our mission: *To advance cardiovascular ultrasound and improve lives through **excellence** in education, research, innovation, advocacy, and service to the profession **and the** public.* **The impact of our COVID-related statements may be difficult to quantify. However, it is likely that guidance for our members and laboratories has helped provide safer care for our patients while protecting our echocardiographers.**

ASE COVID-19 STATEMENTS

- ASE Statement on Protection of Patients and Echocardiography Service Providers During the COVID-19 Outbreak *(Published March 18, updated April 1, 2020)*
- Pediatric, Fetal, and Congenital Heart Disease Statement *(April 6, 2020)*
- Perioperative/Periprocedural TEE Statement *(April 7, 2020)*
- Sonographer Statement *(April 8, 2020)*
- POCUS Statement *(April 9, 2020)*
- ASE Statement on the Reintroduction of Echocardiography Services During the COVID-19 Pandemic *(May 18, 2020)*

ASEcho.org/COVID-19

THE MYOCARDIAL PERFUSION CODE *for Echocardiography*

CONTRIBUTED BY: THOMAS R. PORTER, MD, FASE, UNIVERSITY OF NEBRASKA MEDICAL CENTER, OMAHA, NE, AND MICHAEL L. MAIN, MD, FASE, SAINT LUKE'S MID AMERICA HEART INSTITUTE, KANSAS CITY, MO

Myocardial perfusion imaging with ultrasound enhancing agents improves the detection of coronary artery disease at rest, and during stress echocardiography.[1] In 2016, the American Medical Association Current Procedural Terminology Panel approved a Category III ("emerging technology") CPT code (0439T) for myocardial contrast perfusion echocardiography, at rest or with stress, for the assessment of myocardial ischemia or viability as an add-on to the primary procedure code. This add-on code still exists in the 2020 Medicare Reimbursement Information codes, and can be used as an add-on to all of the following rest and stress CPT codes: 93306, 93307, 93308, 93350, and 93351. This was a major step forward in the field of myocardial perfusion imaging, as prior to this myocardial perfusion billing was only possible for radionuclide imaging or magnetic resonance imaging.

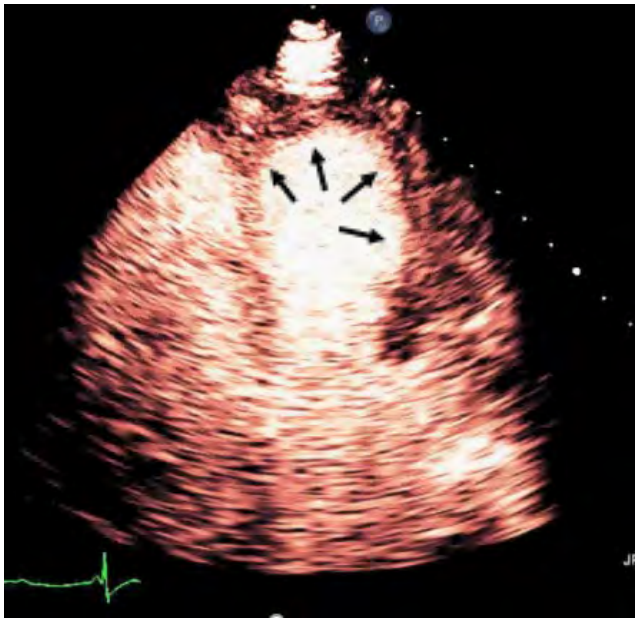


FIGURE 1. AN EXAMPLE OF A RESTING PERFUSION DEFECT (ARROWS) IN THE APICAL FOUR CHAMBER WINDOW IN A PATIENT WITH CHEST PAIN AND A NON-DIAGNOSTIC EKG.

However, there is a concern that utilization of this add-on code by echo labs has been poor. The reason for this appears to be multi-factorial. First, as can be seen in Table 1, there is no reimbursement from Medicare using this code (Category III), and therefore its primary use would be in patients with third party carriers. However, it is unknown whether any third party carrier would reimburse this currently. This has led to concerns from physicians, sonographers, and nurses that costs of any add-on billing charge in these cases would be passed directly to the patient. While this is a significant concern, Medicare uses National Utilization Tracking to determine the actual number of times this add-on code is being utilized in order to make future decisions on reimbursement. Secondly, it may be that billing departments are unaware of what these add-on codes apply to, or when they should be implemented. It is important to note that the perfusion code can be added on to a resting (e.g. intracardiac tumor, intracardiac thrombus detection, or resting chest pain evaluation) or stress (treadmill, dobutamine, regadenoson, or bicycle) study. Therefore, it is critical that efforts be made to achieve a Category I code for perfusion echocardiography.

A proposal for a new or revised Category I code must satisfy all of the following criteria:

1. **All devices and drugs necessary for performance of the procedure or service have received FDA clearance or approval when such is required for performance of the procedure or service.**
2. **The procedure or service is performed by many physicians or other qualified health care professionals across the United States.**
3. **The procedure or service is performed with frequency consistent with the intended clinical use (i.e., a service for a common condition should have high volume).**
4. **The procedure or service is consistent with current medical practice.**
5. **The clinical efficacy of the procedure or service is documented in literature that meets the requirements set forth in the CPT code-change application.**

These criteria can potentially be achieved with what we know is published in the literature, and with a better understanding of how often perfusion echocardiography is

MEDICARE CY 2020 CODING & PAYMENT FOR CEUS

This document illustrates Medicare coding & payment scenarios for use of contrast-enhanced ultrasound (CEUS) in the United States. It neither interprets payer policy nor guarantees payment. Actual payments are site-specific and will differ from examples here. Providers are solely responsible for accurate coding and billing.

	NON-FACILITY (OFFICE/IDTF)					FACILITY (HOSPITAL OUTPATIENT DEPARTMENT)				
Myocardial perfusion	+0439T	Contrast perfusion; at rest or w/ stress, to assess myocard ischemia or viability			Carrier priced	+0439T	Contrast perfusion; at rest or w/ stress, to assess myocard ischemia or viability			Carrier priced
	+93352	Use of contrast agent during stress echo	N/A	N/A	$34.29	+93352	Use of contrast agent during stress echo	N/A	Packaged	$ –
CONTRAST AGENTS	***Fee schedule for Q1 2020 listed below. ASP updated quarterly.***				***$ per ml***	***NB : Temporary pass-through payment. Bill in addition to APC for procedure.***				
Lumason (Bracco)	Q9950	Inj sulf hexa lipid microsph, 5 ml single use vial			$19.59	Q9950	Inj sulf hexa lipid microsph, ml	9085	thru September 30, 2020	$19.59
Optison (GE Healthcare)	Q9956	Inj octafluoropropane mic, 3 ml single use vial			$32.13	Q9956	Inj octafluoropropane mic, ml	N/A	Packaged	$ –
Definity (Lantheus)	Q9957	Inj perfutren lip micros, 2 ml single use vial			$48.20	Q9957	Inj perflutren lip micros, ml	N/A	Packaged	$ –

TABLE 1: A DEPICTION OF THE CURRENT 2020 MEDICARE PAYMENT AND CODING ADVANCES FOR ULTRASOUND ENHANCING AGENT PERFUSION. THIS APPLIES TO ALL THREE CONTRAST AGENTS LISTED. ADAPTED FROM THE ICUS.ORG WEB SITE.

being used in practice. It is critical to document how many physicians are using the add-on code currently, and with what frequency (Criteria 1-3). Two recent meta-analyses have demonstrated the efficacy of both resting and stress myocardial perfusion in current medical practice for improving the predictive value of an echocardiogram in evaluating a patient with suspicion for coronary artery disease.[2,3] This satisfies Criteria 4 and 5.

One of the distinct advantages of myocardial perfusion echocardiography is that it can be performed in adults and children at the bedside without the risk of ionizing radiation. Therefore, it is critical that we provide education programs for physicians on the performance of myocardial contrast echocardiography, and ensure this procedure is performed with a frequency consistent with its intended use.

REFERENCES

1. Porter TR, Mulvagh SL, Abdelmoneim SS, Becher H, Belcik JT, Bierig M, et al. Clinical Applications of Ultrasonic Enhancing Agents in Echocardiography: 2018 American Society of Echocardiography Guidelines Update. J Am Soc Echocardiogr 2018; 31:241-74; https://www.onlinejase.com/article/S0894-7317(17)30821-0/fulltext.
2. Qian L, Xie F, Porter TR. Long term prognostic value of stress myocardial perfusion echocardiography in patients with coronary artery disease: a meta-analysis. Eur Heart J Cardiovascular Imaging 2020;https://doi.org/10.1093/ehjci/jeaa026.
3. Qian L, Xie F, Xu D, Porter TR. Prognostic value of resting myocardial contrast echocardiography: a meta-analysis. Echo Res Practice 2020;https://doi.org/10:1530ERP-20-0023.

Introducing the All-New ASE ImageGuideEcho Registry

Contributed by: Sarah Beth Bdoyan, MSPH, ASE's Director of Research and Quality

ASE is thrilled to announce our newly-enhanced ImageGuideEcho™ Registry. The all-new ImageGuideEcho is developed in partnership with new registry vendor ARMUS, an organization with a history of excellence in technology and registry solutions that spans over two decades. Key to the new offerings for ASE and its members is **ARMUS' technological capabilities including data extraction, outcomes-focused data collection, and image storage.**

Sherif Nagueh, MD, FASE, Chair of ASE's Registry Committee, said, "Through this partnership with ARMUS and the re-launch of our registry, the mission of ImageGuideEcho will be able to be fully realized through automatic data capture, outcomes connections, and potential for image inclusion. ASE looks forward to leveraging this information for the benefit of patient care."

Figure 1: ImageGuideEcho Registry Dashboard

The new ImageGuideEcho also offers modernized data visualizations for benchmarking quality of care data and examining performance at the individual, institutional, and national level. These visualizations are customizable according to your institutional needs. Having all echo data in one seamless interface allows for new insights to be generated, which enables easy recognition of quality gaps and facilitates targeted quality improvement.

ImageGuideEcho is a repository for patient reporting which currently collects transthoracic echocardiography and stress echocardiography report information, but will be expanding to include image collection, pediatric echocardiography, perioperative echocardiography, and critical care echocardiography. This information can all be extracted seamlessly from participating institutions through multiple avenues, including automatic PACS extraction, CVIS integration, and Certified Software Reporting Vendors. **None of this new extraction will require manual entry.** The registry also allows you to automatically generate performance measures from this information for benchmarking.

As the data volume continues to increase within the ImageGuideEcho registry, this data can be intelligently leveraged to develop advanced statistical models and reports, for decision support, control charts, dashboards, and comparative analysis of several cardiac procedures.

Through ASE's partnership with ARMUS, the all new ImageGuideEcho also allows for **immediate site level connections to outcomes data with other registries and also with national sources of outcomes information.** These integrations have clear impacts for increasing opportunities in echocardiography research by allowing for direct connections between quality imaging studies and improved patient outcomes. Additionally, by creating a large image repository connected to the echo report, ASE is creating multiple avenues for technology development and machine learning, which are key to the future of echocardiography and cardiovascular imaging.

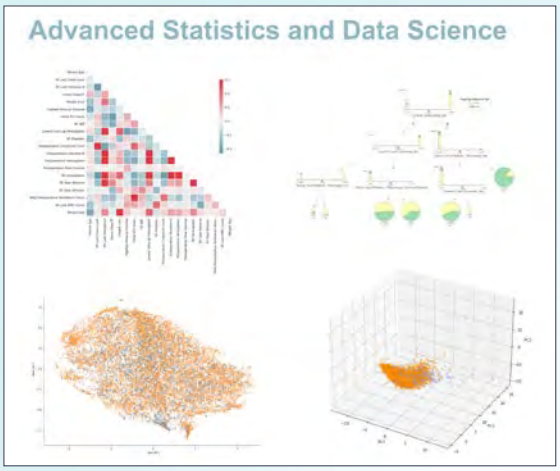


Figure 2: Examples of ARMUS' Analytics Capabilities Offered to ImageGuideEcho Participants

These exciting new opportunities in the registry have been designed based on the needs voiced by ASE members to understand the role 3D/4D technology and other technology plays in improved patient outcomes. These enhancements to ImageGuideEcho will also help ASE members utilize registry data to better advocate for the need of ultrasound enhancing agents (contrast) and other technology in order to benefit patient care and clinical outcomes.

This ASE-driven endeavor is changing how we look at the future of data in our field. ImageGuideEcho will continue to grow in its value as more institutions join in sharing data. All institution types are encouraged to join us on this journey into the new frontier of echo. We look forward to partnering with you as you take advantage of the registry's benefits as we advance the field of echo together.

Have questions about how your institution can participate? Email us at **Info@ImageGuideEcho.org**, and ASE staff will set up a call with you to share more.

ImageGuideEcho.org

ImageGuideEcho

A module under the ImageGuideRegistry platform

Unique in the Registry Space

1

QUALITY IMPROVEMENT

Quality of care for your institution.

2

AUTOMATIC DATA SUBMISSION

Utilize ADS through PACS or reporting software integration.

3

NATIONAL BENCHMARKS

Compare your performance against automatically generated national benchmarks.

4

OUTCOMES DATA

Connect to outcomes data and other registries in one portal with ARMUS' Hybrid Technology.

5

RESEARCH

Examine data in the registry to conduct innovative research.

For a personalized demonstration, please call 919-297-7174 or email Info@ImageGuideEcho.org.

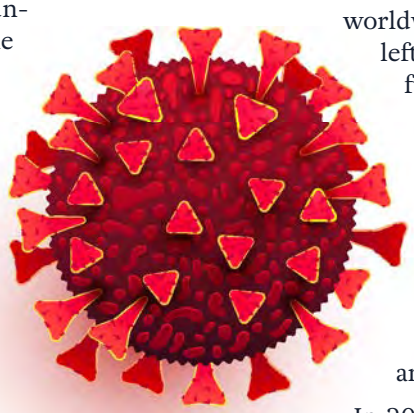
ImageGuideEcho.org

WASE Researchers Study How

COVID-19 AFFECTS THE HEART

Contributed by: Ilya Karagodin, MD, University of Chicago, Chicago, IL; Tatsuya Miyoshi, MD, MedStar Health Research Institute, Washington, DC; Roberto M. Lang, MD, FASE, University of Chicago, Chicago, IL; and Federico M. Asch, MD, FASE, MedStar Health Research Institute, Washington, DC

The World Alliance Societies of Echocardiography (WASE) Normal Values study was initially launched during the 2016 ASE Scientific Sessions, and entailed the acquisition of complete two-dimensional (2D) and three-dimensional (3D) echocardiograms of patients with no history or evidence of cardiac, lung, or kidney disease. Enrollment of 2,008 individuals of multiple races evenly distributed among genders, adult age groups, and geographies was completed by the end of 2018 in 19 centers from 15 countries worldwide. The goal of the study was to determine normal chamber quantification values in different parts of the world. All echoes were analyzed in collaboration with MedStar Health Research Institute and the University of Chicago, and funded by the ASE Foundation and its donors, with generous support from TOMTEC Imaging Systems, Medidata, Medstar Health Research Institute, and University of Chicago.



Thus far, WASE has resulted in multiple abstracts and podium presentations, and most recently three manuscripts have been published from the WASE Normal Values study. The first manuscript outlined the rationale and design of the study;[1] the second outlined the normal 2D reference values for left ventricular size and function amongst different races and nationalities;[2] and the third, published earlier this year, outlined the worldwide differences in left ventricular diastolic function in healthy adult individuals based on nationalities and age.[3] Forthcoming manuscripts will outline 2D and 3D normal reference values for both the left atrium and the right ventricle.

In 2020, the WASE team has sought to stay relevant to the current needs of the medical community. As the COVID-19 pandemic continues to affect communities around the world, cardiologists and imaging experts have all asked the same important questions: How does COVID-19 affect the heart, and which echo parameters are the best prognostic markers in this novel disease process?

To answer these important questions, principal investigators Federico M. Asch, MD, FASE, and Roberto M. Lang, MD, FASE, leaned on ASE International Alliance Partners and friends, including study centers from the United States, Canada, Mexico, Brazil, India, China, Iran, Italy, Philippines, and the United Kingdom, many of which participated in the original WASE Normal Values study.

To better understand the effect of COVID-19 on the heart, WASE COVID investigators are obtaining echocardiographic data on COVID-19 positive patients with the goal of determining:

1. **Whether the disease presents differently in various geographic regions; and**
2. **Which echocardiographic parameters are most prognostic of clinical outcomes in COVID-19.**

Initial studies have suggested that COVID-19 affects both the left and right ventricle, with right ventricular dysfunction portending a worse prognosis, an observation that this study will seek to confirm and explore further. The study will incorporate clinical information including vitals, labs, and previous medical conditions to determine which clinical markers are most prognostic in COVID-19.

WASE COVID is being funded by the ASE Foundation and supported by industry partners Ultromics, a UK-based data analytics company, and TOMTEC Imaging Systems. Data will be analyzed using artificial intelligence-based deep learning algorithms in order to quantify left and right ventricular size, function, and longitudinal strain.

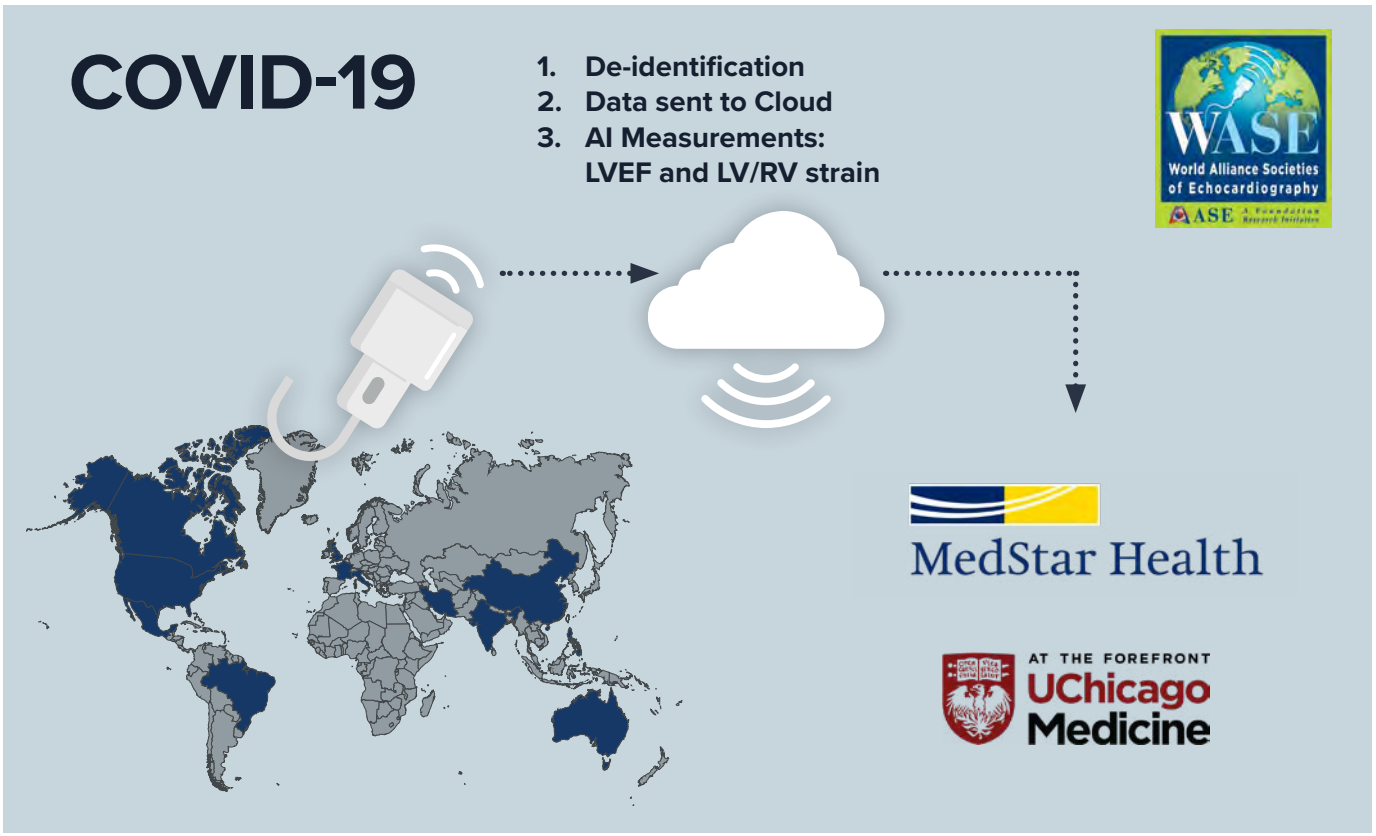


FIGURE 1: ECHOCARDIOGRAMS FROM PARTICIPATING CENTERS WORLDWIDE (REPRESENTED COUNTRIES HIGHLIGHTED IN BLUE IN MAP) ARE DE-IDENTIFIED LOCALLY AND SENT TO A SECURE CLOUD. ARTIFICIAL INTELLIGENCE AND DEEP LEARNING ARE THEN USED TO ANALYZE THE DATA TO DETERMINE THE LEFT VENTRICULAR EJECTION FRACTION (LVEF), AS WELL AS LEFT AND RIGHT VENTRICULAR GLOBAL LONGITUDINAL STRAIN (GLS), ALLOWING FOR STREAMLINED ANALYSIS OF A LARGE NUMBER OF COVID-19 POSITIVE PATIENTS FROM AROUND THE WORLD.

What makes this ASE-supported study unique is the power of collaboration of multiple stake-holders in our ultrasound community (professional society, scientists, industry, engineers) to answer relevant clinical questions at a time of an unprecedented urgency in the midst of a global pandemic. This worldwide collaboration hopes to shed light on how COVID-19 affects patients in different parts of the world. "The information derived from the WASE COVID study will help us achieve a better understanding of the effect of COVID-19 on the heart, as well as which echo parameters are most predictive of morbidity and mortality in this novel disease process," said Dr. Roberto Lang. Study investigators Asch and Lang hope to publish their initial findings from the WASE COVID study by late 2020.

ASE has made it a priority to focus on the impact of COVID-19 on our patients, members, and practices by ensuring the safety of patients and sonographers during the novel COVID-19 pandemic. In support of this effort, ASE recently published a manuscript entitled, "ASE Statement on Protection of Patients and Echocardiography Service Providers During the 2019 Novel Coronavirus Outbreak," published in the *Journal of the American Society of Echocardiography* in June 2020.

REFERENCES

1. Asch FM, Banchs J, Price R, Rigolin V, Thomas JD, Weissman NJ, et al. "Need for a global definition of normative echo values—rationale and design of the World Alliance of Societies of Echocardiography Normal Values Study (WASE)." Journal of the American Society of Echocardiography 32.1 (2019): 157-162.
2. Asch FM, Miyoshi T, Addetia K, Citro R, Daimon M, Desale S, et al. "Similarities and differences in left ventricular size and function among races and nationalities: results of the World Alliance Societies of Echocardiography Normal Values Study." Journal of the American Society of Echocardiography 32.11 (2019): 1396-1406.
3. Miyoshi T, Addetia K, Citro R, Daimon M, Desale S, Fajardo PG, et al. "Left Ventricular Diastolic Function in Healthy Adult Individuals: Results of the World Alliance Societies of Echocardiography Normal Values Study." Journal of the American Society of Echocardiography 33.10 (2020): 1223-1233.
4. Kirkpatrick JN, Mitchell C, Taub C, Kort S, Hung J, and Swaminathan M. "ASE Statement on Protection of Patients and Echocardiography Service Providers During the 2019 Novel Coronavirus Outbreak." Journal of the American Society of Echocardiography 33:6 (2020): 648-653.

PARENTAL ACQUISITION OF ECHOCARDIOGRAPHIC IMAGES IN PEDIATRIC HEART TRANSPLANT PATIENTS USING A HAND-HELD DEVICE

A Pilot Telehealth Study: Prescient to COVID-19 Times

Contributed by: Seda Tierney, MD, FAAP, FASE, FACC, FAHA, Associate Professor, Pediatrics, Director of Research, Non-Invasive Imaging Laboratory, Director of Vascular Laboratory, Stanford MCHRI Faculty Scholar, Stanford University School of Medicine, Stanford, CA, and Leo Lopez, MD, FASE, FACC, FAAP, FAHA, Medical Director of Echocardiography and Lucile Packard Children's Hospital Stanford, Clinical Professor of Pediatrics, Stanford University School of Medicine, Palo Alto, CA

Telehealth is a promising new tool in medicine that is changing the landscape of medical care. A 2018 database of 52 pediatric telehealth programs shows that neurology, psychiatry, neonatology, critical care, and cardiology are among the top five specialties offering telehealth services.[1] Telehealth intervention programs have also been successfully used to manage pediatric diabetes and obesity.[2,3] The benefits of telehealth technology are numerous, including improved access to care and potential savings in the delivery of care.[4,5] Patients in rural communities without nearby specialized centers are able to see experts in the field without extensive travel. Additionally, patients who have difficulty scheduling clinic visits due to school or work obligations are given more flexibility and the ability to schedule home appointments. Current challenges of incorporating telehealth services into regular clinical care include licensure and regulatory barriers, difficulties related to insurance reimbursements, and high cost associated with establishing a successful telehealth infrastructure.[1,6] These are barriers that need to be overcome in order to assure telehealth's future scalability and expansion to reach all patients in need.

In our pilot study, we evaluated the feasibility of parental acquisition of echo images to assess left ventricular systolic function in pediatric heart transplant patients (**Figures 1 and 2**).[7] Echocardiography and telemedicine have already been widely implemented where a sonographer or specialized provider obtains ultrasound images from a patient and then transmits them to an off-site cardiologist for real-time supervision.[6] In this study, we examined if parents, rather than experienced professionals, could be trained to obtain echo images from their children. After a routine clinic visit, a pediatric cardiologist specialized in imaging led a one-hour training

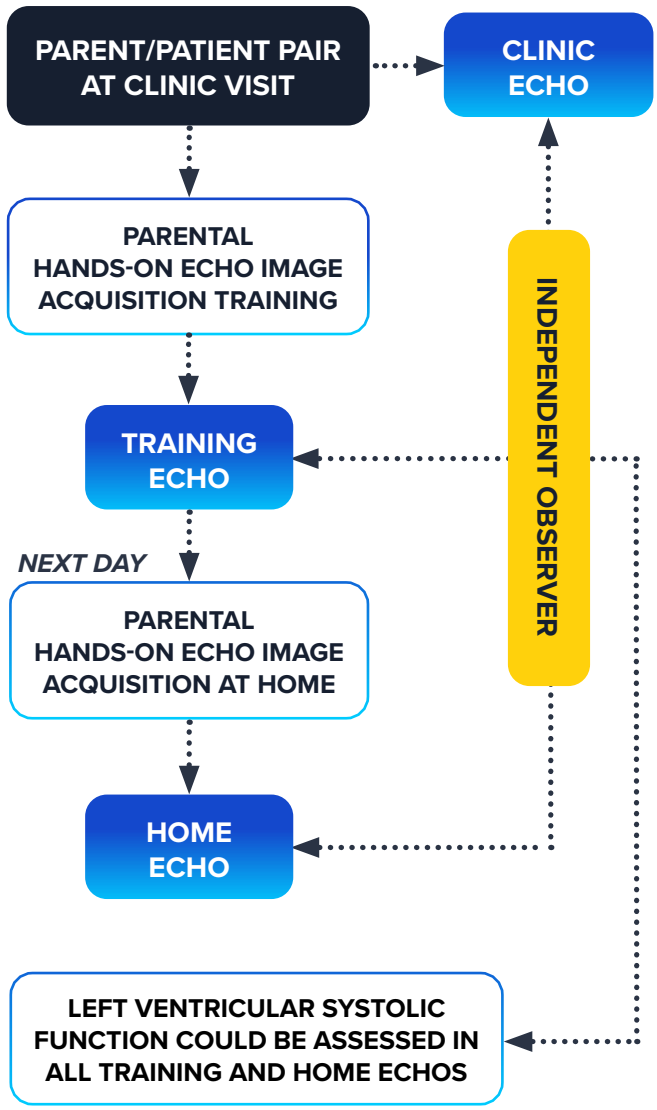


Figure 1

session to teach parents of heart transplant patients to acquire images in parasternal short-axis and apical views using a hand-held echo device. Parents were instructed to reimage their child at home the following day with the same device. Clinical, training, and home echo studies were reviewed by a pediatric cardiologist. Our results showed that all parents were able to acquire home images adequate for assessment of left ventricular systolic function. Most of the parents reported that they felt at least "moderately comfortable" using the device. Furthermore, multiple parents expressed sentiments of empowerment to contribute to their child's care.

Our findings are encouraging. However, it is conceivable that parents of heart transplant patients are a highly motivated group who may feel empowered having an additional tool to assist in their child's care. Another perspective could be that parents of children with transplanted hearts or decreased left ventricular systolic function may be under a great deal of stress and learning a new technique to acquire echo images on their children may further compound that stress. Thus, not every parent might be well-suited for this role in their child's care. We have tested this approach in another setting, namely in pediatric Marfan patients, where we have trained parents to obtain focused images of the aortic root and mitral and aortic valves. The results again have been very encouraging.

In collaboration with Drs. David Rosenthal and John Dykes, our colleagues who care for pediatric heart transplant patients at Stanford, we are currently exploring the feasibility of a clinical tele-echo program which would consist of an in-person parental training session followed by parental-focused home echo image acquisitions supervised in real-time by sonographers. Inclusion of the sonographer supervision will ensure diagnostic quality of the images and ongoing education of the parents. We have worked closely with the Information Technology team to establish a secure, HIPAA-compliant infrastructure to transmit the images for immediate remote assessment, which is imperative for clinical use of home echo studies.

We believe that using telehealth to complement clinic-based long-term echo surveillance of heart transplant patients could be an important new tool to allow parental home acquisition of echo images and subsequent immediate assessment of left ventricular systolic function and valvular function in pediatric heart transplant patients after transmission to interpreting physicians. While the initial costs of both time to train parents and the hand-held echo devices are high, we hope to achieve savings by avoiding unnecessary emergency care, travel, and clinical echo studies over the lifespan of heart transplant patients. Validating these benefits will be an important component of future initiatives to expand the use of tele-echo in the care of children with congenital and acquired heart diseases.

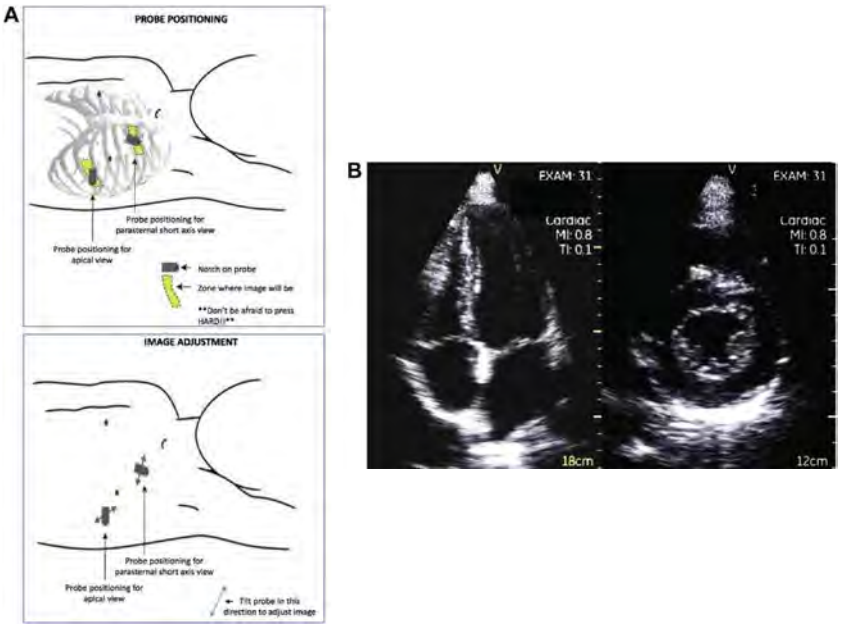


FIGURE 2 (A) PARENTAL ECHO IMAGE ACQUISITION TRAINING GUIDE: PROBE POSITIONING. (B) PARENTALLY ACQUIRED HOME ECHO IMAGES USING THE HANDHELD ECHO DEVICE.

REFERENCES

1. Olson CA, McSwain SD, Curfman AL, Chuo J. The Current Pediatric Telehealth Landscape. Pediatrics 2018;141.
2. Guttmann-Bauman I, Kono J, Lin AL, Ramsey KL, Boston BA. Use of Telehealth Videoconferencing in Pediatric Type 1 Diabetes in Oregon. Telemed J E Health 2018;24:86-88.
3. Nourse SE, Olson I, Popat RA, Stauffer KJ, Vu CN, Berry S, et al. Live Video Diet and Exercise Intervention in Overweight and Obese Youth: Adherence and Cardiovascular Health. J Pediatr 2015;167:533-9 e1.
4. Lindgren S, Wacker D, Suess A, Schieltz K, Pelzel K, Kopelman T, et al. Telehealth and Autism: Treating Challenging Behavior at Lower Cost. Pediatrics 2016;137 Suppl 2:S167-75.
5. Jue JS, Spector SA, Spector SA. Telemedicine broadening access to care for complex cases. J Surg Res 2017;220:164-170.
6. Satou GM, Rheuban K, Alverson D, Lewin M, Mahnke C, Marcin J, et al. Telemedicine in Pediatric Cardiology: A Scientific Statement From the American Heart Association. Circulation 2017;135:e648-e678.
7. Dykes JC, Kipps AK, Chen A, Nourse S, Rosenthal DN, Selamet Tierney ES. Parental Acquisition of Echocardiographic Images in Pediatric Heart Transplant Patients Using a Handheld Device: A Pilot Telehealth Study. J Am Soc Echocardiogr 2019;32:404-411.

LEARN HOW TO APPLY STRAIN IMAGING WITH *ASE'S COMPREHENSIVE STRAIN IMAGING*

Contributed by: Tom Marwick, MD, PhD, MPH, Director, Baker Heart and Diabetes Institute, Melbourne, Australia

Over the last decade, it would have been hard to attend a major imaging or cardiology meeting, or open an imaging journal without seeing reference to myocardial strain. This fundamental physical parameter, reflecting the amount of deformation in response to an applied force, has been contemplated as a potential clinical measurement for decades. However, the ability to feasibly provide this information really became possible with the development of speckle tracking techniques 15 years ago.

Researchers have loved this new modality. It has provided the opportunity to easily measure the function of every cardiac chamber, including new insights into physiology, ranging from the long axis function of the heart, to indices of torsion and twist. For clinicians, however, the adoption of strain into clinical practice has been slow, and quite variable. There are many reasons for this, and it hasn't just been about the need to overcome clinical inertia, and skepticism about the opinions of experts. At initial approach, the strain literature can be frankly bewildering. Shortening is expressed as a negative number, and better function is more negative – leading to the need for verbal acrobatics to describe differences and changes ("worsening" and "improving" are less ambiguous than "increasing" and "decreasing"). Not only that, but it can be unnecessarily complicated, with different measurements for each direction, the different levels of the myocardium, and the ability to measure the magnitude and timing of deformation, as well as a combination of both (strain rate). Strain is perceived (wrongly in my opinion) as time-consuming and difficult to do. And at one stage, an unacceptable degree of variability was reported between vendors, based on non-uniform definitions of where strain should be measured. Nonetheless, the strain juggernaut has continued, unabated, because the parameter is feasible, reproducible, and combines sensitivity to small degrees of change with an impressive level of test-retest reproducibility which makes it helpful for sequential measurements of therapeutic responses, exemplified by cardiotoxicity. In recognition of this, a specific billing code for strain measurement was launched in the USA this year, and this perhaps will erode the last major barrier to broad acceptance, because the time, expertise, and effort required to do this test are now rewarded.

In this context, and in the hope of broader clinical use of strain, the American Society of Echocardiography has joined with Elsevier in the publication of a strain textbook targeted at a clinical readership (***Figure 1***). While strain has been a component of previous books (and of course the entire strain literature can be identified through search engines), the unique aspect of this work is that its focus is on showing the clinician how this parameter can help with diagnosis and decision-making in various scenarios (***Figure 2***). If you don't understand the steps to strain acquisition, or you are uncertain as to when or how to use this parameter, this may be the book for you (***Table 1***).

CHAPTER 1 (Strain Imaging Applications and Techniques) explains how strain works. In addition to explaining the physics, and how tissue Doppler and speckle tracking can be used for making these measurements, this chapter explains normal ranges, acquisition, and post-processing techniques. Explanations are provided regarding the pitfalls that arise from artifacts and physiologic disturbances that confound the association of strain with myocardial function.

The ability to recognize and track subclinical cardiac dysfunction has perhaps been the most potent driver of the clinical application of strain imaging. **CHAPTER 2 (Detection of Preclinical Heart Failure)** describes the limitations of Left ventricular ejection fraction (LVEF) for detection of subclinical cardiomyopathy. Cardio-oncology is probably the most important application of strain imaging today,

and this chapter summarizes the role of strain for risk stratification, diagnosis of subclinical cardiomyopathy during treatment, and detection of cardiomyopathy in survivors. Of course, the utility of strain is not restricted to subclinical dysfunction arising from cardiotoxicity, and in addition may be of value in hypertensive heart disease, diabetes and a variety of nonischemic causes of heart failure.

However, it would be wrong to think that the application of strain is only for assessment of subclinical dysfunction. **CHAPTER 3 (Evaluation and Monitoring of Patients with Heart Failure)** shows how strain may be of value in the diagnosis of heart failure with preserved ejection fraction (HFpEF), and in the prognostication of not only HFpEF but also HFrEF.

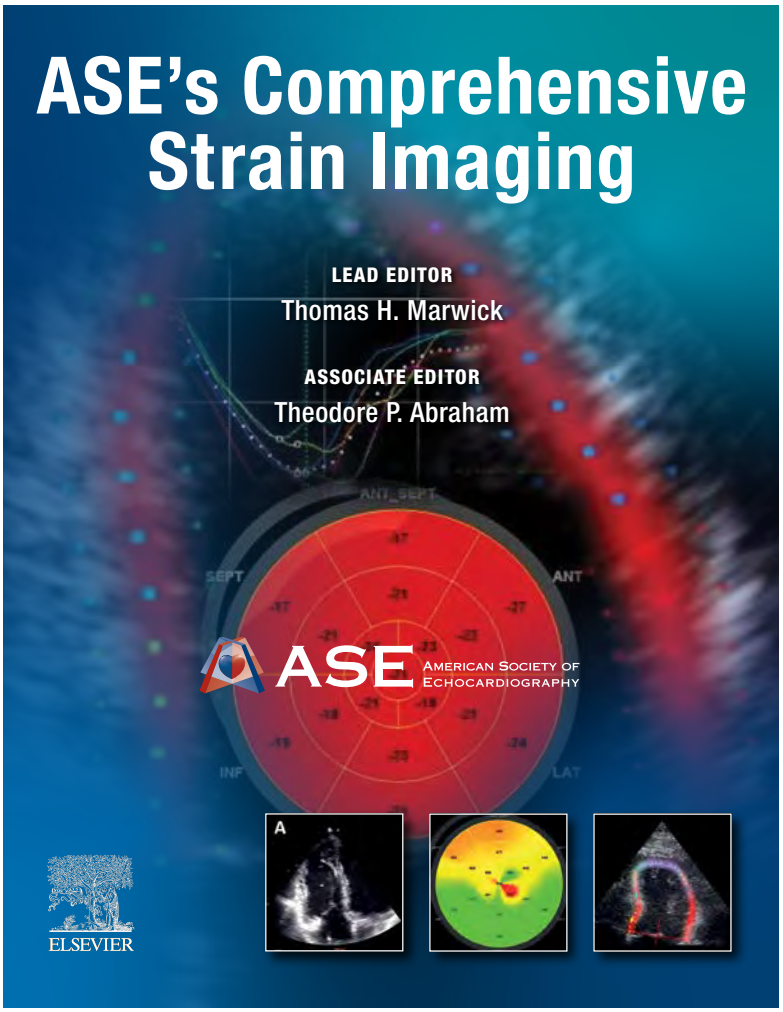


FIGURE 1: ASE'S STRAIN IMAGING TEXTBOOK

Indeed, strain is of value for the assessment of cardiomyopathies, whether patients do or do not have heart failure. **CHAPTER 4 (Evaluation and Monitoring of Patients with Cardiomyopathies)** emphasizes the role of strain in understanding the dilated, malfunctioning, or thickened heart. The patterns of strain associated with infiltration provide a diagnostic window to tissue characterization that is relatively unique within echocardiography.

People with cardiomyopathy processes often die from arrhythmia. **CHAPTER 5 (Temporal Dispersion of Contraction: Arrhythmias and Dyssynchrony)** emphasizes that strain measurement is not just about amplitude but also timing. Understanding the dispersion of contraction is vital to the assessment and treatment of patients with left bundle branch block using cardiac resynchronization therapy. Even in the absence of conduction defects, dispersion of contraction is an important marker of the risk of serious arrhythmias, and is uniquely measurable with strain imaging.

The value of strain in recognizing diastolic dysfunction and HFpEF has been hidden because strain is a systolic marker. **CHAPTER 6 (Detection and Characterization of Diastolic Dysfunction)** emphasizes that not only ventricular but atrial strain provide insight into diastolic dysfunction, as well as the risk of developing atrial fibrillation.

Likewise, the value of strain for understanding primary myocardial disease is sometimes obscured by its value in assessment of myocardial dysfunction secondary to other causes. **CHAPTER 7 (Assessment of Valvular Heart Disease)** provides the background to understanding how strain measurement is useful for the assessment of both mitral regurgitation and aortic stenosis. The underlying physiology, threshold measurements, and clinical implications are provided.

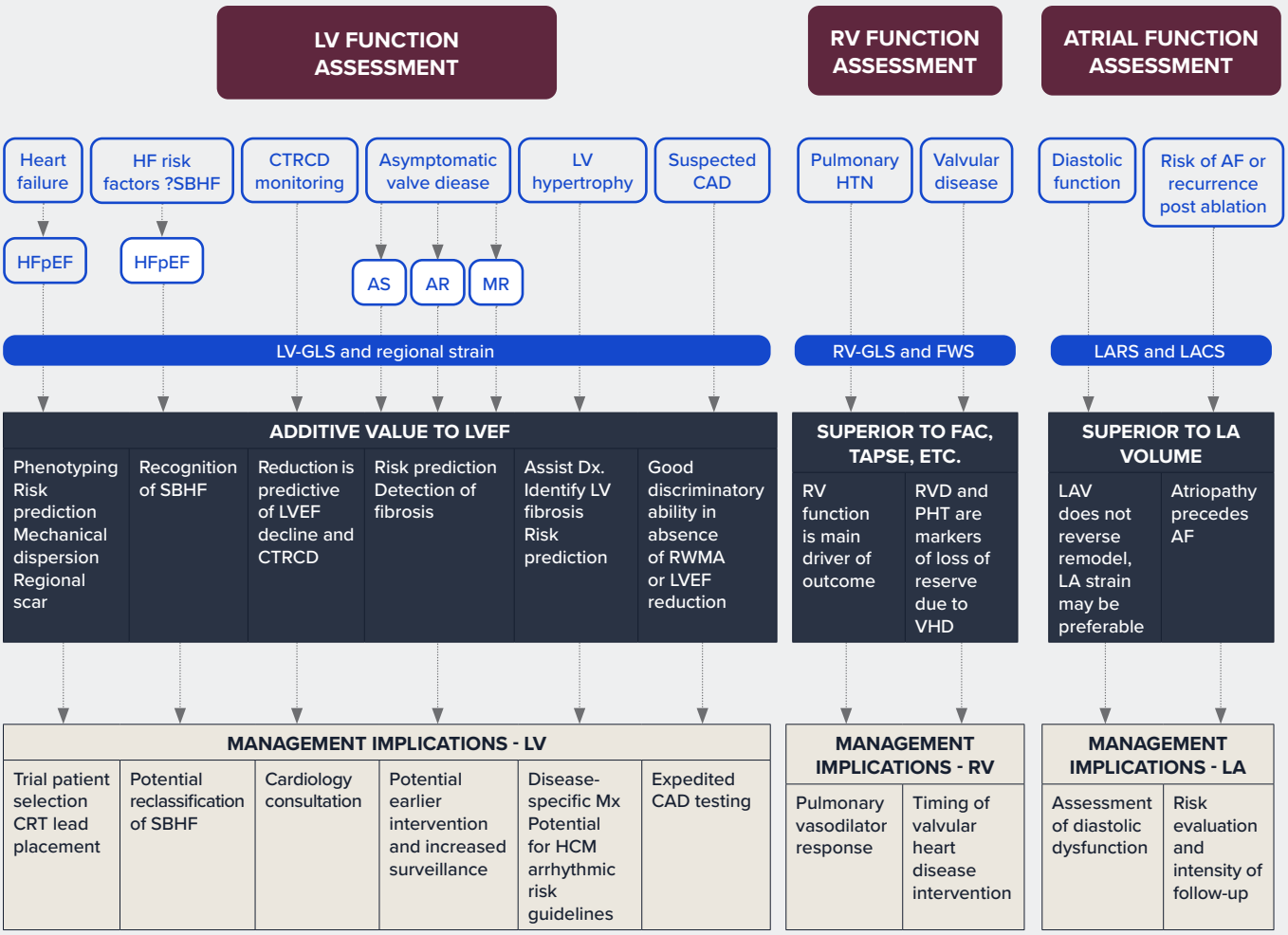


FIGURE 2: DIAGNOSIS AND DECISION MAKING IN STRAIN IMAGING

It is paradoxical that while the major initial attraction in the development of strain imaging was to quantify regional function, the use of the technique until now has been very largely driven by the success of global longitudinal strain (often referred to as GLS). **CHAPTER 8 (Understanding Myocardial Mechanics in IHD)** provides insights into the use of strain for the assessment of regional function. Although regional peak strains are insufficiently reliable for this purpose, the morphology of the strain curve is vital to the recognition of myocardial ischemia and viability. These are especially pertinent observations in the context of post-processing software purported to facilitate the interpretation of myocardial ischemia, which is based primarily on the magnitude rather than the timing of strain.

Although much of the strain literature relates to the left heart, myocardial strain measurements of the right ventricle offer an approach to quantification that is superior to the conventional echocardiographic measurements of right ventricular function. **CHAPTER 9 (Patient Evaluation of Right Ventricular Function and Pulmonary Hypertension)** explains the fiber morphology of the right ventricle, and therefore its deformation metrics, reference values of strain, and the diagnostic and prognostic implications in a number of cardiac conditions, including arrhythmogenic right ventricular cardiomyopathy.

The main focus of this book is about how simple strain parameters can be used to facilitate clinical decision-making today. However, strain imaging continues to evolve, and **CHAPTER 10 (Future Applications of Strain Imaging)** emphasizes the techniques that are on the cusp of translation, including pheno-mapping using machine learning, and myocardial tissue characterization using high frame-rate ultrasound.

The first echocardiographic images of the heart were obtained about 70 years ago, and the technique of echocardiography has shown a continuous evolution. Within my own career in echocardiography, I have witnessed substantial jumps in the feasibility and versatility of the technique, based around the development of two-dimensional imaging, color Doppler, transesophageal echo, and stress echocardiography. Strain echocardiography represents another of these major "step changes." While ejection fraction and various conventional parameters were appropriate for the technology of the 1950s and 60s, not only the technical but also the clinical environment has changed in the 2020s. We now need to identify not only the presence of dysfunction, and quantify the severity, but to predict it, understand this mechanism, its likelihood for responding to various interventions, and its prognostic implications. It has been a pleasure to co-edit this book with Dr. Ted Abraham from the University of California, San Francisco, and to call upon the expertise of international leaders of the field ranging from Australasia to Europe and North America. I hope that this new textbook will help to encourage the clinical acceptance of strain and to reassure clinicians, scientists, and industry of the ongoing relevance of cardiac ultrasound, and its ability to provide major and beneficial advances.

ASE's Comprehensive Strain Imaging **textbook will be available in the summer of 2021 through ASE's Learning Hub. If you would like to be contacted when it is available for purchase, please email Store@ASEcho.org.**

TABLE 1. YOUR STRAIN QUESTIONS ANSWERED

QUESTION	CHAPTER
What are the uses of parametric displays? When should I look at the strain curves and the polar map display?	1. Strain Imaging Applications and Techniques
How to use this in cardio-oncology? How much of a change is meaningful? What are the potential confounders?	2. Detection of Preclinical Heart Failure
Can strain help with the diagnosis of HFpEF?	3. Evaluation and Monitoring of Patients with Heart Failure
How can strain help distinguish causes of increased LV wall thickness?	4. Evaluation and Monitoring of Patients with Cardiomyopathies
What is myocardial dispersion and how is it measured?	5. Temporal Dispersion of Contraction: Arrhythmias and Dyssynchrony
What is atrial reservoir strain? How is it measured and how is it useful?	6. Detection and Characterization of Diastolic Dysfunction
Is LV global longitudinal strain useful in aortic stenosis? What cut-off should be used to identify risk?	7. Assessment of Valvular Heart Disease
What component of the regional strain signal can be used to identify ischemia?	8. Ischemic Heart Disease
Is sequential measurement of pulmonary artery pressure sufficient for assessing pulmonary vasodilator response in primary pulmonary hypertension?	9. Evaluation of Right Ventricular Function and Pulmonary Hypertension
What is elastography and how is it measured?	10. Future Applications of Strain Imaging

Explore All the Options of the New ASE Learning Hub

CONTRIBUTED BY: CHRISTINA C. LAFURIA, ASE'S VICE PRESIDENT OF EDUCATIONAL ACTIVITIES

ASE LEARNING HUB™
Learn today. Lead tomorrow.

Long before the COVID-19 pandemic, ASE members regularly participated in online education for professional development. Since 2010, ASE has produced more than 1,000 online educational offerings. Currently over 39,000 individuals have access to those resources in exchange for continuing education credits and enhancing their knowledge in cardiovascular ultrasound.

With the introduction of the new ASE Learning Hub in May 2020, ASE now has even more options for online education. The Learning Hub offers many different formats to give every learner an approach that fits their needs.

ONLINE COURSES – ASE online courses cover an array of topics including Proper Measurements, 3D Echo, TEE in SHD, Diastology, and more. All the courses offer module testing to assess the learner's knowledge.

EXAM PREP/SELF-ASSESSMENT – Whether you are taking the echocardiography boards for the first time or re-certifying, ASE has a full complement of products that help our members study for the ASCeXAM, ReASCE, Sonographer's Registry exam, or the Advanced Cardiac Sonographer exam. These tools are also helpful for assessing areas where learners may need more study.

WEBINARS – From guideline-based to disease specific, all ASE live webinars allow for participants to interact with the faculty. Attendees' questions are answered either during the webinar or in the follow-up. The live webinars are recorded and registrants have access to the content on demand for three years.

The ASE Industry Series are webinars created by industry partners that allow participants to gain cutting-edge information on devices, products, procedures, and equipment.

Translated guideline webinars can also be found on the ASE Learning Hub. These webinars have been translated into Spanish, Portuguese, and Chinese.

JASE ARTICLES – At least one article from each issue of JASE is selected to be featured on the Learning Hub. These articles cover a myriad of topics of interest to our members and include CME/MOC points.

VIRTUAL EVENTS – ASE virtual events are collections of live and recorded presentations, typically organized by topic or subject. Content may be available only live, but more often is available for live viewing and later for viewing on demand. ASE's first virtual event, Echo Access, was a collection of recorded presentations from the State-of-the-Art Echocardiography live course in February 2020. It focused on two tracks: Pathology and Structural Heart Disease, Muscle Mechanics, and Strain.

CONFERENCE RECORDINGS – The ASE Review Course and Scientific Sessions are all recorded and stored on the ASE Learning Hub. This allows users who are not able to attend the live course to access this educational information.

TEACHING SLIDES – Pre-designed slide sets are available to educators who need information on *Comprehensive Transthoracic Echocardiography Protocols and Instrumentation* as well as *Comprehensive Transesophageal Echocardiography in Children and All Patients with Congenital Heart Disease*.

PRODUCTS – ASE offers physical products to complement our online offerings. Guideline binders, flip charts, and pocket guides are available. Two new textbooks, *ASE's Comprehensive Echocardiography* 3rd edition and *ASE's Comprehensive Strain Imaging* (see page 28), will debut in the Summer of 2021.

Considering the abundant choices for online education, you don't have to choose between your schedule and your need to stay current in the field of cardiovascular ultrasound. If you want to delve into a specific topic or review a disease state that is causing challenges, the ASE Learning Hub offers the format and content you need, right at your fingertips.

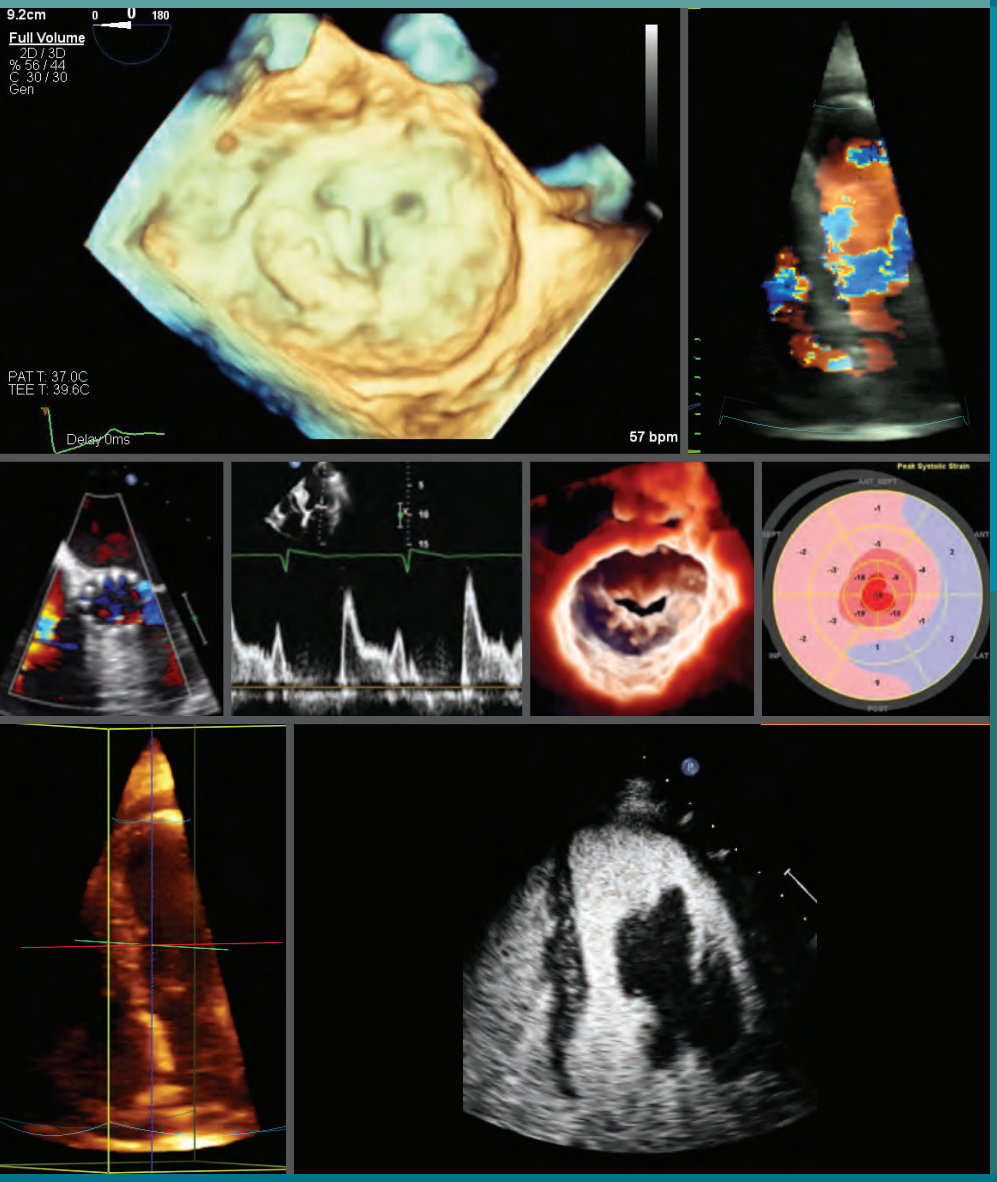
ASELearningHub.org

Advanced Echo:
VIRTUAL EXPERIENCE

featuring content from Echo Hawaii and State-of-the-Art Echocardiography

February 27-28, 2021

#AdvancedEcho



CHAIRS

James D. Thomas, MD, FASE
Past President, ASE
Northwestern Medicine
Chicago, IL

William A. Zoghbi, MD, FASE
Past President, ASE
Houston Methodist Hospital
Houston, TX

CO-CHAIRS

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

Sunil V. Mankad, MD, FASE
Mayo Clinic
Rochester, MN

Register at ASEcho.org/AdvancedEcho

ASE American Society of Echocardiography
Sound Saves Lives

ASE Foundation

Jointly provided by the American Society of Echocardiography and the ASE Foundation.

ELEVATING MEMBER EXPERIENCES
through ASE Specialty Interest Groups

ASE Specialty Interest Groups (SIGs) are volunteer-led groups created to support our members who have similar interests in emerging, specialized areas of cardiovascular ultrasound. SIGs bring together ASE members, providing a forum for networking, knowledge sharing, and the development of SIG-specific programs and services within ASE. Here are descriptions of the four ASE SIGs that were created in 2020. For more information visit: **ASEcho.org/SIGs**.

CRITICAL CARE ECHOCARDIOGRAPHY

Chair: Arthur Labovitz, MD, FASE, FACC, FAHA, Naples Cardiac and Endovascular Center and Tampa General Hospital

Over the past decade, echocardiography has played an increasingly important role in the care of critically ill patients. In addition to those with conventional cardiovascular training, individuals with backgrounds in emergency medicine, pulmonary, and anesthesia critical care have become quite expert in the acquisition and interpretation of echocardiographic images. The Critical Care Echocardiography (CCE) Specialty Interest Group of the ASE was created to address the needs of these members whose experience with echocardiography does not fall into the conventional cardiovascular training arena. Currently, the CCE SIG is composed of individuals involved with the CCE exam and POCUS task force and is expected to grow exponentially over the next few years. The role of the CCE SIG will be to customize activities that have been associated with the success of ASE, such as educational resources, research, advocacy, and patient care. The power of echo to assist in the care of patients is appreciated by a diverse group of caregivers, and this SIG will continue the enhancement of their ASE member experience.

EMERGING ECHO ENTHUSIASTS

Chair: Lucy Safi, DO, FASE, Hackensack University Medical Center; and SIG members, Tiffany Chen, MD, FASE, Hospital of the University of Pennsylvania; Sara Creighton, MD, Children's Hospital of Wisconsin; Zabrina Duncan, RDCS, Scripps Clinic

Starting out in your career can be scary and challenging: you are now expected to find a job, apply what you have learned, be an expert in echocardiography, and continually hone your abilities. In this moment, you may want to connect with others going through similar experiences and the Emerging Echo Enthusiast (E3) Specialty Interest Group allows just that!

E3 is a new ASE Specialty Interest Group for early career physicians and student sonographers who practice adult, pediatric, and intraoperative echocardiography. The goal of this new SIG is to provide the new generation of echocardiographers with resources for career development, clinical education, and research collaboration. Our current projects include tutorials showing practical "tricks of the trade," online forums on how to approach the job search, and much more.

Follow the E3 SIG on Twitter @E3ASE and for more information visit ASEcho.org/e3-Hub. We look forward to having all early career echo enthusiasts join us!

INTERVENTIONAL ECHOCARDIOGRAPHY

Co-chair: Nishath Quader, MD, FASE, Washington University in St. Louis and SIG member, Stephen H. Little, MD, FACC, FASE, Houston Methodist DeBakey Heart & Vascular Center

In response to the increasing volume of structural heart cases, ASE recently created the Interventional Echocardiography (IE) Specialty Interest Group. With vital input from nationally renowned experts in the field, this group plans to bring attention to the various issues that face this burgeoning field. Some of the ways this interest group intends to get its members involved is through virtual journal clubs, webinars, and other educational opportunities through ASE. All ASE members with an interest in interventional echocardiography are encouraged to join this SIG.

NEONATAL HEMODYNAMICS TnECHO

Chair: Patrick J. McNamara, MD, University of Iowa; Co-chair: Wyman Lai, MD, MPH, MBA, FASE, CHOC Children's Hospital; and SIG members, Regan E. Giesinger, MD, University of Iowa; and Philip Levy, MD, Boston Children's Hospital

The goal of the Neonatal Hemodynamics TnECHO (NHTS) Specialty Interest Group is to cultivate innovation and scientific discovery, foster clinical and academic co-operation, and reshape practice and training guidelines for the management of cardiovascular problems in newborns and young infants. Implementation of Hemodynamics programs across North America has resulted from strong collaboration between neonatologists with formal training in TnECHO and Pediatric Echocardiography Laboratory leaders. These programs have helped promote standardized imaging guidelines and clinical pathways, create hemodynamic fellowship-training programs, and cultivate hemodynamics research. The NHTS SIG founding members have played a pivotal role in developing normative echocardiography datasets across gestations, enhanced mechanistic insight into common neonatal cardiovascular problems (e.g., patent ductus arteriosus, pulmonary hypertension) through echocardiography-guided research, and validated the reliability of common echocardiography techniques in newborns. The ASE NHTS SIG will help anchor these efforts within a well-established society of cardiovascular imagers, and support both the mission and strategic goals of ASE through enhanced membership and professional diversity.

HOW TO JOIN AN ASE SPECIALTY INTEREST GROUP

1. Log in to the ASE Member Portal.
2. Scroll down, find the "Specialty Interest Groups" section.
3. Click the name of the SIG you want to join, then click on the ">" symbol so the SIG appears in the "chosen" box on the right.
4. Scroll to the bottom of the page, click "Save and Refresh Profile Information."

In Memoriam

"It is not length of life,
but depth of life."

Ralph Waldo Emerson

We will remember and miss these ASE members who passed away in the last year.

Mukul Chandra, MD

Maurizio Galderisi, MD, FASE

Joel Holland, MD

Alfred F. Parisi, MD, FASE

Martin St. John Sutton, MBBS, FASE

Mary Jo Hermes Tsokolas, RDCS, MHA

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.

Renew for 2021 today

at ASEcho.org/Renew

VOLUME 9 ISSUE 1 **NOVEMBER 2020**