

2.5 MH2/2.5 MH2 0 dB G(t): -2 dB 5 mpr: 51 dB DP: 2.3 14.0 cm (c): -9 dB



**15** How the Leadership Academy has Advanced ASE's Sonographer Leaders

#### President's Message

Empower Others, Accept Differences, and Encourage Trust

Utility of Echocardiography for the Cardiac Surgeon 4 10 12 .62

VOLUME 11 ISSUE 3 MARCH 2022



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#### EDITORS' NOTE

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

## PRESIDENT'S HALFWAY MARK AND THE PANDEMIC: A TIME CAPSULE

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

The pandemic has

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or in many cases,

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his message was written in early January for the March editions of JASE and *Echo* magazine. It marks the mid-point in my presidency. This halfway point has come quickly, and it seems a good time for reflection and a progress report. In my initial President's Page statement, published in the July 2021 JASE,1 I outlined four core "presidential initiatives" that I thought would be timely and critical for moving ASE forward. How much progress have we made on these, which include 1. Living Guidelines and Standards development, 2. Research coordination, 3. International relations reorganization, and 4. Educational Curricula development? I will provide a brief update on these items,

but my reflection includes the fact that somewhat

unexpectedly and to some extent, in disbelief, we continue

to struggle with the COVID -19 Pandemic, as we begin 2022.

#### Let me begin with the item most impacted by COVID-19 – International relations.

The pandemic has markedly affected our ability to manage in-person educational meetings, which have fallen as cancellations, or in many cases, conversions to virtual encounters. Our traditional, live, in-person organizational and educational meetings were the venues where many of our international relations activities occurred. These live encounters included a mix of social rendezvous, solidifying per-

sonal relationships and building new ones through networking; mentoring; interacting with industry partners; and sharing different cultures in cities around the globe where informal meet-ups could unexpectedly produce impactful organizational outcomes. Honors dinners and galas marked passages and outlined the future. By publication time in March 2022, the Pandemic's duration will have been a full two years. ASE's February 2020 Stateof-the-Art Echocardiography (SOTA) Meeting in Scottsdale, Arizona was the final unmasked traditional gathering event of ASE with the Global Pandemic having been declared in March of that year. Much has been written and spoken about the silver linings of this public health crisis and the alacrity with which we have been able to pivot to virtual meetings and conferences or congresses. However, just prior to the Delta wave, peaking in October 2021, we, as an organization, had already anticipated a waning of infection rates, and a back-to-normal mentality led us to anticipate a live 2021 Echo Florida meeting in Orlando, and the EuroEcho meeting in Berlin seemed a sure thing - tickets and hotel rooms were purchased. The return to near normalcy with a COVID-precautions mentality came to an end as we entered fall and winter. We understood what those in the Southern hemisphere had foreshadowed during our summer months. Because hope springs eternal, an end appeared to be in sight in November as Americans enjoyed the Thanksgiving Holiday, confident in the knowledge that booster shots and reasonable precautions with a waning (or at

least a plateau) of the Delta variant would allow mid-winter and spring in-person meetings to occur. Yet, December ushered in the Omicron variant, which seems to have produced a different, possibly milder but more highly infectious illness, even in the face of double vaccination, and in many cases with a third booster vaccination. Following the holiday season, Omicron has famously become the dominant viral strain. Although we cautiously and tentatively planned for the January Echo Hawaii meeting – seemingly of a manageable size and

in an isolated and favorable environment — it was with the knowledge that the Omicron spike was now occurring, and the planned live versions of February '22 SOTA, February '22 Society of Critical Care Medicine, February '22 ACC CV Summit, and even April '22 Japanese Society of Echocardiography echo meetings had fallen back to virtual for a second year.

Several questions emerge. Are we at a "new normal" or preparing for a "new normal." Has the pandemic actually already passed, and are we entering into a phase of endemic COVID-19 where the disease is manageable, and we can move back to in-person? (ASE's Annual Scientific Sessions in Seattle, WA are still scheduled as in-person.) OR, do new viral variants have yet to emerge that could present new setbacks? Because the Omicron spikes in some regions have been intense, but brief, it is possible we will already know some of the answers to these questions in the short space of two months. This message will then serve as a "time capsule" of a time when we did not have enough information to hope too much or the certainty to plan with much confidence. Nonetheless, the pandemic has been profoundly transformative in many ways that will not be apparent for a long time.

What we do know is the impact over the past six months from the standpoint of educational and international disruptions. The President of ASE is, in a sense, a face of the organization. The illustration (Figure 1) represents the different venues where I, personally, would have been invited as an in-person guest. I have shown small screen shot samples of my virtual didactic lectures and the program status. So, for me, I have been an armchair traveler only - producing virtual didactic lectures and honing my ability to do so. As many others know, this is a lot of work, but the material seems more "packaged," concise, and durable. However, in virtual one can never be sure who, in fact, was truly engaged with learning in the moment of presentation, sometimes at strange early AM hours. Though this virtual landscape can be a bit lonely, aside from the discussion panels which are all too short, there is real opportunity. Participating as a juror in the EuroEcho young investigator awards session was a highlight of my year.

#### Now a brief progress report on the initiatives:

- 1. Living Guidelines and Standards. The work group has been established. Living guidelines methods, in concept, are accepted and processes are under review and will be implemented with the infrastructure support managed by our newly hired ASE VP of Technology, Tom Tyler, MBA, along with the day-to-day assistance of a new (soon to be hired) Guidelines Research Specialist.
- **2. Research Coordination:** In early December, Dr. Sam Siu, Research Committee Chair, and I convened a large stakeholder oversight group meeting. Participants represented all research-related areas within ASE and the ASE Foundation, and the 11 or so different types of research projects now in progress or in development. A smaller core working group of six plan to meet in February to process ideas from the larger group and develop a framework to be discussed in March. I am optimistic that we will develop a flexible research framework that will encourage further progress in ASE's goal to create science in all areas related to cardiovascular ultrasound in an entrepreneurial, creative environment with appropriate efficiencies and reduced redundancies.
- **3. International Relations:** A pandemic silver lining to disruptions has been the inclusion of many more international members and educational attendees than we have seen before. (e.g., the ASCeXAM Review Course usually has less than 20 international attendees; in 2021, this number had grown to 64. In 2019, there were 424 international attendees at the ASE Annual Scientific Sessions [which were live] from 26 countries. This



A visual snapshot of the places that ASE President, Raymond Stainback, would have been attending in-person if not for the pandemic. past June, there were 962 international attendees from 59 countries who were "at" the virtual Sessions. This is an amazing 31% increase.) This is because of virtual options which were not employed prior to the pandemic. In addition, we have gotten used to connecting via social media in a particularly intense fashion in the build up to events and as important didactic lectures and scientific news are presented. This has exploded, with ASE at the forefront, led by Ritu Thamman, MD, FASE, and many others in our Leadership Academy twitterverse. As we plan for the Scientific Sessions in Seattle, an ASE Luminary table-naming program for the ASE Foundation (ASEF) Research Awards Gala will provide financial support for the Pamela S. Douglas Research Scholar endowment fund. An International table has been funded by ASE and Liv Hatle, MD, has been selected as the first honoree (for the next five years), and we hope this will be a focal point for our international members attending the Gala. The ASEF's international outreach has traditionally included global outreach trips around the globe to provide education and services in underserved areas. Unfortunately, many of these efforts remain on hold, but with Jim Kirkpatrick, MD, FASE, at the helm as the ASEF new board Chair as of January 2022, we have no doubt that his ability to champion these types of efforts will prevail, even when many of our international partners may not have adequate internet and Wi-Fi access. Hope springs eternal as we hang on to and further develop our international relations - societies supporting each other through virtual attendance – as we navigate the changing environment. I have to admit that we currently feel things are in a holding pattern in many ways, though we expected many more opportunities, such as rekindling the World Congress of Echo with the help of Madhav Swaminathan, MD, FASE, and Federico Asch, MD, FASE. Hope springs eternal again. Mike Picard, MD, FASE, Editor-in-chief of JASE, communicated to me his observation that both the 2020 and 2021 JASE Editorial Board meetings were more highly attended than ever by the international editorial board members because these were virtual. A moving and pleasant occurrence. And, a virtual meeting for this group would never have occurred in the past.

**4.Educational Curricula:** Carol Mitchell, PhD, FASE, successfully rolled out an educational program for sonography school programs with ASE curated material, available by subscription starting in August 2021. The prospect for this availability created a true buzz and a feeling that this was greatly needed. This sonographer program has led to a next step, the creation of a physician-directed set of digital curriculum packages, an effort headed by Peter Rahko, MD, FASE, and Jayashri

Aragam, MD, FASE. With Dr. Mitchell onboard, we have conducted several brainstorming sessions and are devising outlines and knowledge packets first directed towards fellows in training, which may be of particular interest to program directors in cardiology, critical care, and anesthesia for onboarding new trainees. Again, curriculum development with accelerated pandemic-related virtual educational programs will be a strong tailwind for this effort.

In conclusion, my progress report includes an optimism that my presidential initiatives are on track for completion. In some cases, this is due to the silver lining of the pandemic which has led us to hyper zoom and be perhaps even more productive in some ways, as opposed to always progressing to the next travel meeting. Our digital skills and products have boomed in this environment. Still, we know not where we are going which can be unsettling. We cannot even imagine what the next two months may bring. Will we see an end to the development of virtual fatigue? Will our world include many of the needed and traditional in-person human interactions soon? Where is our new normal? Alas, if I could I only fast forward to March when this is published?! In the meantime, we have no choice but to stay tuned to the environment and each other, adaptable, and optimistic in each day. I submit this time capsule for our thoughts, fears, and reflections at the COVID two-year mark and my presidency halfway point.

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



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# ASE2022 SOUND WAVES IN SEATTLE: CONNECTING THE WORLD

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

Contributed by **Amer M. Johri, MD, MSc, FRCPC, FASE,** Queen's University, Kingston, Ontario Canada; **Yvette Chrinian,** Department of Medicine, Queen's University, Kingston, Ontario Canada; and **Aaron W Aday, MD, MSc,** Vanderbilt University Medical Center, Nashville, TN



HE ASE CAROTID PLAQUE guidelines, published in the July 2020 issue of the *Journal of the American Society of Echocardiography* (JASE), provide recommendations for the definition and quantification of carotid arterial plaque for the purpose of cardiovascular disease (CVD) risk stratification, using a newly established grading consensus. This modern grading system now allows for the identification and characterization of protuberant plaque lesions smaller than the carotid intima-media thickness (CIMT) threshold value for identifying diffuse plaque, and sets up a framework of standardization for continued outcomes-based research across the spectrum of plaque lesion shapes, sizes, and types.

#### **Defining Plaque**

CIMT measurement identifies areas of increased carotid artery wall thickness. While CIMT may predominantly reflect the presence of risk factors, CIMT has not been shown to consistently add to prediction of CVD outcomes. Thus, the ASE carotid plaque guidelines emphasize the value of arterial plaque quantification beyond CIMT.

While some atherosclerotic plaques are discrete lesions that can be easily distinguished, plaque can also be diffusely spread over the surface of the wall, appearing indistinct from the media. In such cases it is difficult to determine whether there is simply medial thickening present or eccentric, diffuse plaque. The guideline considered a threshold CIMT value beyond which thickening should be considered eccentric plaque and thus suggested that any thickness ≥1.5 mm should be considered diffuse-type plaque.

The guidelines also recognize that ultrasound resolution now allows for the visualization of distinct protuberant plaque lesions that could be smaller than 1.5 mm, and such protuberant lesions should also be identified as the presence of plaque. The guidelines recommend the evaluation of both protuberant and diffuse types of carotid arterial plaque for CVD risk stratification and the serial assessment of atherosclerosis.

#### **Quantifying Plaque**

To facilitate comparison across studies and monitoring of patient outcomes, a framework for grading atherosclerotic plaque based on thickness was developed. The guidelines suggest that plaque thickness (height) be measured as the initial 2D approach for quantification of carotid ultrasound plaque (**Figure 1**). Although plaque height is often measured from 2D images, it may also be obtained from a 3D image acquisition when available, to overcome the out-of-plane limitations of 2D imaging.

To promote standardization, measurement begins at the same adventitial plane as where the CIMT measurement begins in the long axis of the right or left arterial bulb. The maximal plaque height should be measured using a caliper placed at the adventitial plane and extending into the center

#### Figure 1

of the lumen at right angles to the vessel wall. This may be taken at any segment of the carotid artery, with the view and segment reported accordingly.

The guidelines recommend plaque height as a simple measure to promote quantification amongst laboratories wishing to adopt this technique for risk stratification. However, it is recognized that there are other quantitative and semi-quantitative methods available such as plaque area



and plaque score, which may also be assessed. Thus, there is no recommendation against other plaque quantification methods as outcome based data continue to emerge.

#### **Advance Quantification Methods**

Currently, data for grading of plaque volume by 3D is limited, and further study is needed to develop threshold cut-off values that best predict CVD risk. Three-dimensional volumetric ultrasound quantification is preferred when expertise and equipment is available, and a recommendation for plaque volume quantification is provided to promote standardization. A 2D plaque height can also be obtained from a 3D acquisition.

We recommend the quantification of plaque volume for an individual plaque lesion when required (e.g., morphologic assessment, serial assessment, or pre-operative consideration), using either the stacked-contour method or specialized semi-automated tools.

In the single-plaque or single region protocol, the 3D volume acquisition is centered over the identified plaque in any one chosen segment, or just over the right and left carotid arterial bulb, allowing for quantification of total plaque volume in the distal common carotid artery (CCA), bulb, and bifurcation, as well as in the portion of the internal carotid artery (ICA) that can be visualized. In contrast, a full vessel protocol sums the volume of all plaque seen in right and left carotid arteries throughout all segments. Analytic software calculates total carotid arterial The role of automation and artificial intelligence to integrate various plaque parameters with patient features and other stratification modalities is an exciting area of current exploration. plaque by summing the volume of plaque seen in all major segments of the right and left carotid arteries. The full vessel protocol is more complex, and should be considered provided the following criteria are met: time,

expertise, equipment, and analytic software for accurate registration of multiple 3D volume acquisitions. Finally, 3D analysis may also play a role in the assessment of surface morphology and/or ulceration and continues to be studied.

#### The Future of Plaque Analysis

The role of composition analysis to assess plaque vulnerability and tissue types continues to emerge including using methods such as gray scale median analysis and assessment of intra-plaque neovascularization using contrast enhanced ultrasound. The role of automation and artificial intelligence to integrate various plaque parameters with patient features and other stratification modalities (such as in combination with stress echo) is an exciting area of current exploration. The guidelines recommend a standard grading to define plaque, suggest methods of quantification, and provide a simple algorithm for implementation in CV risk stratification for the clinician in an effort towards translation to practice.

# Empower Others, Accept Differences, and Encourage Trust

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



ARCH IS A CELEBRATION of our Women's History Month. We would like to celebrate the work of all women in echocardiography and recognize the mentors of our field who have promoted equality and diversity within our field. We celebrate the excellent work of women in echocardiography and the pioneers of our field. See the PCHD article in the January *Echo* magazine Women Pioneers in Echocardiography.

Women's History Month started in 1978 when Dr. Gerda Lerner celebrated Women's History week and stated that Women's History is Women's Rights. In 1980, President Jimmy Carter stated, "Too often the women were unsung and sometimes their contributions went unnoticed. But the achievements, leadership, courage, strength, and love of the women who built America was as vital as that of the men whose names we know so well."<sup>1</sup> The equality of rights became the 27th amendment after his presidency. In 1987, Congress passed the petition to designate the month of March as Women's History Month. This is also celebrated in the United Kingdom, Taiwan, and Australia on March 8th as International Women's Day, and during October in Canada.

The recent release of the American Association of Medical Colleges report in 2021 reaffirms a persistent gender pay gap in U.S. medicine<sup>2</sup> - 43 years after the call to action for women's rights. In 2022, we

will promote equality and diversity in our field of ultrasound and within ASE. With the ongoing pandemic, significant numbers of women have left work to care for their children, and we would like to acknowledge the continued contribution of women and men equally in echocardiography while balancing childcare and family life. ASE's Women in Echocardiography Task Force can help you get connected with mentors in echocardiography and empower you to lead in the field of cardiovascular ultrasound. The ASE Leadership Academy is another avenue to learn leadership skills to effectively lead within your organization. Dr. Pei-Ni Jone, who is a recent graduate of the Leadership Academy, describes her personal journey as a woman in echocardiography and leadership skills attained through the Leadership Academy.

As a woman in echocardiography, I learned that trust is the currency of excellent leadership. This was critical when I was building a 3D program from ground zero and in my journey leading a group of junior faculty and sonographers as the Director of 3D Echocardiography at Children's Hospital Colorado. Demonstrating complete trust in my team empowered them to perform efficiently and was key to building a successful 3D Program. We used 3D echocardiography in every preoperative valvular lesion to demonstrate

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the relationship of chords and papillary muscles to the valve leaflets. We shared these images at the surgical conference with our surgeons who then confirmed our findings intra-operatively. This systematic approach successfully helped us gain trust from our surgical colleagues to use 3D echocardiography to aid their surgeries. We are advancing innovation by using 3D echocardiography to guide catheterization procedures to reduce radiation. The values of providing the best patient care and high-quality 3D echocardiography images are fundamental to build trusting relationships in our team.

Through the ASE Leadership Academy, I had the privilege to meet mentors and colleagues who travelled the same journey of building programs and teams in echocardiography. We learned the skills to negotiate with the hospital administrators by viewing the issues through their lens and finding the "black swan" to win our negotiations.<sup>3</sup> Specifically, I was able to get our entire fleet of echocardiography machines upgraded and exchanged to the newest platform and 3D imaging software by finding the "black swan": all computer machines had to be Windows 10 compliant to prevent IT security risks for the hospital. These skills are critically important to leverage when negotiating for our team so that the team can continue to perform the highest quality ultrasound imaging required for our patient care.

On your journey in echocardiography, remember to empower others, accept differences by promoting equality and diversity, and encourage trust within your team. Our greatest success is not in never falling, but in rising every time we fall. Please consider joining ASE's Women in Echocardiography Community at Connect@ASE or Leadership Academy if you are interested in empowering others and daring to lead in the field of ultrasound career.

#### **Book Recommendations**

- 1. Dare to Lead by Brene Brown
- 2. Never Split the Difference: Negotiating as if Your Life Depended on It by Chris Voss
- 3. The Moment of Lift: How Empowering Women Changes the World by Melinda Gates
- 4. Lean In: Women, Work and the Will to Lead by Nell Scovell and Sheryl Sandberg



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- 2. Gottlieb, AS and Jagsi R. Closing the gender pay gap in medicine. N Engl J Med 2021; 385:2501-2504
- 3. Never Split the difference: Negotiating as if your life depended on it. Chris Voss

# Utility of Echocardiography for the Cardiac Surgeon

Contributed by **Akbarshakh Akhmerov, MD**, Jack and Gitta Nagel and Family Endowed Cardiac Surgery Fellow, Department of Cardiac Surgery, Smidt Heart Institute, Cedars-Sinai Medical Center, Los Angeles, CA and **Danny Ramzy, MD**, **PhD**, Department of Cardiac Surgery, Smidt Heart Institute, Cedars-Sinai Medical Center, Los Angeles, CA



CHOCARDIOGRAPHY IS ONE of the most powerful noninvasive instruments for preoperative, intraoperative, and postoperative assessment of a cardiac patient. Preoperatively, transthoracic echocardiography (TTE) can aid in the assessment of the causes and severity of various cardiac pathologies, including coronary artery and valvular diseases. Intraoperatively, the use of transesophageal echocardiography (TEE) can significantly impact surgical management and the conduct of an operation, by providing valuable images and data about ventricular function, valvular anatomy, and flow dynamics.<sup>1, 2</sup> Intraoperative use of TEE can also detect surgical complications, which may warrant urgent intervention. Finally, postoperative TTE is critical for surveillance. In this overview, we will briefly survey the utility of echocardiography in the perioperative assessment of surgical valvular disease, mainly the mitral and aortic valves, and coronary artery bypass grafting. There are many other indications, however, which are beyond the scope of this review.

#### **Surgical Mitral Valve Disease**

Preoperative TTE elucidates mitral valve pathologies, quantifies severity, and guides management.<sup>3, 4</sup> In cases

Echocardiography is one of the most powerful noninvasive instruments for preoperative, intraoperative, and postoperative assessment of a cardiac patient.

of mitral regurgitation (MR), echocardiography allows the surgeon to define the mechanism of mitral regurgitation by assessing leaflet morphology and motion; determining the severity of mitral regurgitation; and identifying the consequences of long-standing disease such as abnormal left atrial size, left ventricular function, or pulmonary pressures. The causes of mitral regurgitation can be broadly classified as either ischemic or non-ischemic. And the mechanisms of mitral

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regurgitation can be classified as primary/organic, where the mitral valve is intrinsically diseased; or secondary/functional, where the mitral valve is structurally normal but becomes secondarily involved. Degenerative mitral valve disease (eg, fibroelastic deficiency, Barlow's valve), infections (eg, endocarditis, vegetations, perforations), inflammatory pathology (rheumatic, collagen vascular disease, radiation, drugs), and congenital abnormalities can cause primary MR. Secondary mitral regurgitation, where the valve gradually degrades from healthy to unhealthy, results from ischemic cardiomyopathy, nonischemic cardiomyopathies, and annular dilation.6 The mechanism of

mitral regurgitation can be further characterized and assessed based upon leaflet motion using Carpentier's functional classification system. The breakdown of dysfunctions includes Type I, with normal leaflet motion; Type II, with excessive leaflet motion; and Type III, subdivided as IIIa with restrictive motion in diastole; and Type IIIb, with restrictive motion in systole.

The comprehensive ability of TTE to embrace the entire Carpentier classification system makes it the ideal imaging modality to

assess the etiology of mitral regurgitation. Accordingly, preoperative assessment should focus on the size of the left ventricular and left atrial chambers. Other

considerations should include the mobility of leaflets, the appearance of the papillary muscles, chordal structures, coaptation zone, and the annulus. Furthermore, the severity of mitral regurgitation can be assessed by defining the jet area (Table 1).<sup>6</sup> Severity of mitral stenosis (MS) can be similarly assessed with TTE by assessing valve area (Table 2).7 Thus, preoperative TTE evaluation directly affects treatment through decisions regarding medical management versus intervention; percutaneous versus open surgical approaches; and surgical repair versus replacement. Intraoperatively, TEE can be used to measure the annulus and length of leaflets and guide sizing of the

valve or ring. It can also identify residual regurgitation, paravalvular leaks, and systolic anterior motion of the mitral valve.

#### **Surgical Aortic** Valve Disease

Like mitral valve disease, aortic valve pathology can be extensively characterized with preoperative and intraoperative TEE using Doppler, 2D, and 3D modalities. Evaluations should focus upon valve morphology, the number and appearance of cusps, and the length of the free edge of each

Table 1

cusp.<sup>8</sup> Adjacent structures, including the annulus, left ventricular outflow tract, mitral valve, and aortic walls, should also be evaluated. The three primary causes of

		SEVERIT	Y OF MITRAL REGURGITAT	TION	
	Jet Area (cm²)	Vena Contract Width (cm)	Effective Regurgitant Orifice Area (cm <sup>2</sup> )	Regurgitant Volume (mL/beat)	Regurgitant Fraction (%)
Mild	< 4	< 0.3	< 0.2	< 30	< 30
Severe	> 10	≥ 0.7	≤ 0.4	> 60	≥ 50

	SEVERIT	Y OF MITRAL STENOS	s
	Valve Area (cm2)	Pulmonary Artery Pressure (mmHg)	Mean Gradient (mmHg)
Mild	> 1.5	< 30	< 5
Severe	< 1.0	> 50	> 10



aortic stenosis (AS) include degenerative disease, a congenitally abnormal valve (eg, bicuspid), and rheumatic valve disease. Doppler assessment with TTE can quantify the severity of aortic stenosis based on valve area (**Table 3**).<sup>7</sup> The most common cause of aortic insufficiency (AI) is dilation of the aortic root or annulus, followed by infective endocarditis, and rheumatic and bicuspid valvular disease. Aortic insufficiency can be graded with TTE by assessing the central jet width (**Table 4**). Qualitatively, the aortic leaflets and the left atrial size should also be assessed.<sup>6</sup> Thus, a circumspect, echocardiographic evaluation of the aortic valve can guide operative management (repair vs. replacement) and surgical approach (minimally invasive vs. full sternotomy).

#### **Coronary Artery Bypass Grafting**

Intraoperative use of TEE for coronary artery bypass grafting (CABG) has been broadly associated with lower operative mortality, especially in higher risk patients.9 In addition, TEE use is associated with a greater odds of unplanned valve procedures. Therefore, the echocardiographer should evaluate biventricular function, estimate volume dependency and filling pressures, appraise valvular function, examine the aorta for atheromatous burden, and assess for possible mechanical complications of myocardial infarction.<sup>8</sup> Echocardiographic assessment of biventricular function is particularly important when weaning from cardiopulmonary bypass and determining the need for inotropic support. In addition, a thorough evaluation can detect issues with the graft, as well as complications related to cannulation, entrapment of air, or myocardial protection.<sup>8</sup> Graft issues may manifest as either regional or global function abnormalities. Detection of any of these abnormalities would mandate an urgent intervention.

	Severit	y of Aortic Stenosis	
	Valve Area (cm2)	Peak Velocity (m/sec)	Mean Gradient (mmHg)
Mild	> 1.5	< 3.0	< 20
Severe	< 1.0	> 4.0	> 40

#### Conclusion

As is demonstrated above, echocardiography provides invaluable images and data in the surgical management of patients with cardiovascular disease. Both TTE and TEE have significant utility in patients undergoing a broad spectrum of cardiothoracic procedures including pulmonic and tricuspid valve interventions; mechanical assist device implantation, cardiac transplantation, minimally invasive cardiac procedures, extracorporeal membrane oxygenation (ECMO) cannulation, and many other surgical interventions. It is resoundingly clear that echocardiography is indispensable to the surgical management of patients with cardiovascular disease and has had a transformative impact on the effectiveness of procedures and long-term outcomes.

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SEVERITY OF AORTIC REGURGITATION					
	Central Jet Width (% of LVOT)	Vena Contracta Width (cm)	Effective Regurgitant Orifice Area (cm2)	Regurgitant Volume (mL/beat)	Regurgitant Fraction (%)
Mild	< 25	< 0.3	< 0.10	< 30	< 30
Severe	≥ 65	> 0.6	≥ 0.30	≥ 60	≥ 50

Table 3

# How the Leadership Academy has Advanced ASE's Sonographer Leaders

Contributed by **Madeline Jankowski, BS, RDCS, ACS, FASE**, Echocardiography Research Associate, Northwestern University in Chicago, IL, member of the 2nd ASE Leadership Academy Cohort, and Member-at-Large on the ASE Council on Cardiovascular Sonography Steering Committee and **Melissa Wasserman RDCS, RCCS, FASE**, Satellite Operations Sonographer Lead, Children's Hospital of Philadelphia, member of the 2nd Cohort of the ASE Leadership Academy, and Guidelines and Standards Representative to the ASE Council on Cardiovascular Sonography



O DATE, sonographers make up 33% of ASE's membership and the demand for dedicated sonographers has never been higher. As an integral part of any cardiology team and as in any career, sonographer leaders are needed at every level. In 2015, ASE developed a fiveyear strategic plan that included a goal of mentorship and training of its dedicated

In an ever-changing healthcare climate, and as our field gets more specialized, sonographer leaders have a responsibility to throw their hats in and advocate for fellow sonographers. volunteer workforce. To help implement that goal, ASE's Governance Task Force was asked to develop a leadership program that

combined didactics, experiential learning, self-directed online learning, and access to ASE senior advisors. Thus, the ASE Leadership Academy (LA) was formed. The 19-month program provides an opportunity for members to increase their knowledge, work with a mentor and cohort peers, and develop leadership skills. These skills can be utilized to help participants grow in their careers within their own institutions, while concurrently creating a pipeline of emerging leaders with specific talents that would ultimately be helpful for ASE's committees and Board of Directors.<sup>1</sup>

In October 2018, the ASE announced that 14 members had been chosen to be part of the inaugural class of the ASE Leadership Academy, including three sonographers. In 2020, three more sonographers were selected for the second LA class. The strategic goals not only guide the Society to include sonographers in the LA, but also suggest the crucial need to groom them for higher positions at ASE. In increasing numbers, there are sonographers achieving higher education, advanced credentials, and leadership positions within their institutions. This growth has revealed a new gap in societal leadership, and ASE has shown continuous commitment to pivoting

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"By establishing the Leadership Academy with sonographers and physicians alongside one another, ASE demonstrates the commitment to sonographer leaders in our Society's future and provides the tools and training to let them shine.

- Keith Collins, MS, RDCS, FASE

as the field of echocardiography evolves. In an everchanging healthcare climate, and as our field gets more specialized, sonographer leaders have a responsibility to throw their hats in and advocate for fellow sonographers.

Advanced practice sonographers Keith Collins, MS, RDCS, FASE, and Carol Mitchell, PhD, RDMS, RDCS, RVT, RT(R), ACS, FASE, have been instrumental in the progress sonographers have made in leadership within our field. When asked about the LA, Collins said, "By establishing the Leadership Academy with sonographers and physicians alongside one another, ASE demonstrates the commitment to sonographer leaders in our Society's future and provides the tools and training to let them shine. This systematic training benefits the sonographer's own personal growth, their employer and ultimately the Society gains a stronger sonographer voice." Mitchell, having been the first sonographer treasurer on the ASE Board of Directors, said "I wish the Leadership Academy opportunity existed when I was first starting my career. I believe the opportunities created by the LA offer sonographers an opportunity to network, take graduate-level management and leadership courses, and facilitate opportunities to become leaders at both their institution and within ASE. The opportunity to take these courses facilitates mastery of new knowledge and skill sets that allow for expanded roles for sonographers both in professional organizations and in their clinical environments. Expansion of traditional sonographer roles will facilitate not only sonographer leadership roles, but also sonographerled dissemination of new information in management strategies, education, and research."2

The Leadership Academy experience teaches a wide variety of relevant topics with discussions led by inspiring leaders in echocardiography. Not only do members learn about topics that would be covered in an MBA or leadership course, but it serves as a platform for members to engage as equals, with members they may not otherwise cross paths with, and discuss these topics with peers and mentors. The LA offers a support system unique to the experience. When first starting the program, members are paired with a mentor. During the course of the program, these mentors prove to not only be guides in the workplace and ASE, but someone to bounce ideas off of, talk you off the ledge, and celebrate your victories as you gain confidence and skill in leadership. Another part of the LA support system is the networking connections you make with thought leaders in ASE. Once you are known as a LA participant, doors continue to open to make lasting connections.

We interviewed sonographers, Kristen Billick (KB), BS, ACS, RDCS(AE/PE), FASE; Ashlee Davis (AD), BSMI, ACS, RDCS, FASE, and Eric Kruse (EK), BS, ACS, RDCS, RVT, FASE, from the inaugural LA class, to understand how the LA has impacted their sonography careers and about their overall experience. We even answered one question ourselves.

### How did the LA help you grow in your career/in your institution?

**<u>EK</u>**: The leadership academy best prepared me with the confidence to continue to take on challenges and help identify my own leadership style. In addition, it prepared me to better assess difficult situations and develop improvement strategies using different approaches.

### What was your favorite part of the LA experience?

**AD:** My favorite part of the LA experience was the bonds I made with the other members of my class. We spent many hours together having deep discussions about the things we were learning and experiencing in our own institutions, and that really created strong connections. I think it was even more profound because we were all experiencing a global pandemic together and able to really rely on each other for support. I continue to keep in contact with many people in my LA class, and they will all be lifelong friends.

MW: I was truly blown away with the topic of

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'Imposter Syndrome' and how our entire class could relate to this feeling in some way. Even our mentors! <u>MJ</u>: The mentorship program initiated at the beginning of the LA has allowed me to discuss opportunities at ASE and within my career with someone who is there whole-heartedly to help me. I trust her feedback and guidance, as her experience adds real-life understanding to the topics taught in the course. My mentor has not only been there professionally, but has become a lifelong friend.

### **Q** What leadership skill did you develop most in your time in the LA?

**KB**: The LA helped me to develop my change management skills. Almost immediately after transitioning into the Echo Lab Manager role, I was faced with some major difficult situations, including the beginning of the COVID pandemic. I had to change my thought process, my priorities, and use innovative thinking and problem solving to navigate my way. I reached out to my LA Mentor and LA peers many times to help me through different situations. I was able to develop new processes and use the change management skills I learned in the LA to make my echo lab safe and efficient without sacrificing quality.

## What would you say to sonographers aspiring to be in this program?

AD: Go for it!

EK: Do it.

**KB:** This is an amazing opportunity to both grow within the ASE and grow within your own organization!

*"It is through initiatives like this that we will have more sonographers as ASE leaders.* 

 Neil Weissman, MD, FASE, Leadership Academy Program Director and ASE Past President

LA program director and ASE Past President, Neil Weissman, MD, FASE, said, "It is through initiatives like this that we will have more sonographers as ASE leaders. That is, leaders that **ARE** sonographers and not just leaders **OF** sonographers. We need sonographers in more leadership roles that have traditionally been held by physicians and Leadership Academy helps train those future leaders." With the introduction of LA, sonographers will continue to have a prominent voice within the ASE.

> Learn more about applying for the 2022-2024 ASE Leadership Academy class at: ASEcho.org/LeadershipAcademy

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