

Gamification of an Interdisciplinary Point-Of-Care Ultrasound Symposium and its Perceived Impact on Learning | *Jimmy Zhang et al.*

Severe Septal Hypertrophy in a Young Asymptomatic Female | *Meghan Tucker*

Sonography Canada Strategic Plan 2023–2025 | *Susan Clarke*



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Severe Septal Hypertrophy in a Young Asymptomatic Female. Meghan Tucker. Figure 5. M-mode at mitral valve level showing systolic anterior motion (SAM).

Message from the Editor-in-Chief

This last issue of CJMS for 2022 brings to you Sonography Canada's strategic plan for 2023 to 2025. It's a must read in order to follow the path of our profession and be involved in its journey.

In this issue, Dr. Jimmy Zhang and his interprofessional team of physicians and educators stretch our imaginations with the use of gamification as a different learning option. They show us that our competitive nature and desire to have fun do not hinder, but rather enhance, knowledge and skills acquisition. As an educator, I personally found this idea intriguing and am wondering if we can run a Sono-games or Sonohunter activity at the next conference or within our provinces. Let me know if you are interested and we can discuss and explore how to implement this idea.

Another great article comes from Megan Tucker, from Mohawk College and the St. Joseph's Health Centre-Unity Health in Toronto, who reports on an unusual case of severe septal hypertrophy in a young asymptomatic female. As a Generalist Sonographer, my knowledge about cardiac abnormalities is limited to pediatrics, but I found this adult cardiac case interesting. A totally asymptomatic patient happened to have an electrocardiogram for no indications that resulted in the detection of an abnormality. An echocardiogram was performed and the sonographer found a more severe abnormality that, if left undetected, could have had dire consequences for this patient. Finally, a cardiac MRI was recommended to obtain a firm diagnosis. This article shows the importance of multimodality imaging. It also reminds us that even asymptomatic patients can have severe abnormalities and that, as a sonographer, it's important to complete a thorough assessment of the anatomy and only use symptomology as a guide.

As you peruse the pages of this journal, it only seems fitting to end the year and this publication with a message from the Chair of Sonography Canada, Carolyn Trottier. Her message talks about building momentum for sonography through the association's efforts to "help improve the image of our profession and influence the perception, decisions, and actions of our members, fellow health-care professionals, governments, and the public." We have 6,300 members of Sonography Canada and Carolyn makes it clear that the support of each one of us is crucial to achieving improved recognition and growth for our profession in this country and that our professional association is working towards that goal.

2022 will be behind us as you read this edition of the CJMS. I want to take this opportunity to acknowledge my behind-the-scene team without whom this journal would not be possible. Thank you to the authors and the exemplary work they have shared with us. To the editors and reviewers that apply their expertise, diligently read each article submitted and provide feedback for the author. Thanks also go out to you, our readers for making the Journal a successful continuing professional development tool and to the Sonography Canada team for their support.



Sheena Bhimji-Hewitt

Broadening Horizons & Pushing Boundaries

*The opinion in this editorial is that of the Editor-in-Chief and not that of Sonography Canada or the Sonography Board of Directors.

Message du rédactrice en chef

Le numéro 4 de CJMS vous présente le plan d'orientation stratégique de Sonographie Canada pour les années 2023 à 2025 ; c'est une lecture incontournable pour suivre le cheminement de notre profession et s'impliquer dans son parcours.

Dans ce dernier numéro de 2022, le Dr Jimmy Zhang et son équipe interprofessionnelle de médecins et d'éducateurs poussent notre imagination en utilisant la gamification comme une option d'apprentissage différente, démontrant que notre nature compétitive et notre désir de nous amuser n'entravent pas l'acquisition de connaissances et de compétences, mais la renforcent. En tant qu'éducatrice, j'ai trouvé cette idée intrigante et je me demande si nous pouvons organiser un Sono-games ou un Sono-chasseur lors de la prochaine conférence ou dans nos provinces - faites-moi savoir si vous êtes intéressés et nous pourrions en discuter et le mettre en œuvre.

Megan Tucker du Mohawk College et du St Joseph Health Center Unity Health à Toronto rapporte une hypertrophie septale sévère inhabituelle chez une jeune femme asymptomatique. En tant qu'échographe généraliste, mes connaissances sur les anomalies cardiaques se limitent à la pédiatrie ; mais j'ai trouvé ce cas cardiaque adulte intéressant, dans la mesure où un patient asymptomatique a subi un électrocardiogramme sans indication ; une anomalie a été détectée et un échocardiogramme a été effectué. L'échographe a trouvé une anomalie plus grave qui, si elle n'avait pas été détectée, aurait pu avoir des conséquences désastreuses pour ce patient, et une IRM cardiaque a été recommandée pour un diagnostic ferme. Cet article montre l'importance de l'imagerie multimodale et le fait que même les patients asymptomatiques peuvent présenter des anomalies

graves; en tant qu'échographe, il est important d'évaluer minutieusement l'anatomie et de n'utiliser la symptomatologie que comme guide.

Le message de fin d'année de Sonographie Canada met l'accent sur le renforcement de la dynamique de la profession pour "contribuer à améliorer l'image de notre profession et influencer la perception, les décisions et les actions de nos membres, des autres professionnels de la santé, des gouvernements et du public". Sonographie Canada compte 6 300 membres, et le soutien de chacun d'entre eux est crucial pour la reconnaissance et la croissance de notre profession au Canada. Sonographie Canada partage également d'autres stratégies de défense des intérêts qu'elle poursuit au nom de ses membres dans cet article.

L'année 2022 sera derrière nous lorsque vous lirez ce journal et je tiens à remercier mon équipe de l'ombre, sans laquelle ce journal ne serait pas possible; merci aux auteurs et à leur travail exemplaire de partage de l'information, aux rédacteurs et aux réviseurs qui lisent avec diligence chaque article soumis et donnent des commentaires explicites et solides, aux lecteurs qui apprécient et donnent des commentaires et à tous les membres de Sonographie Canada pour leur soutien constant. Passez une merveilleuse célébration de fin d'année, et je souhaite à chacun d'entre vous une année 2023 heureuse, saine, sûre et prospère.



Sheena Bhimji-Hewitt

Élargir les horizons et repousser les frontières

*L'opinion exprimée dans cet éditorial est celle du rédacteur en chef et non celle de Sonographie Canada ou du conseil d'administration de Sonographie.

Year End Report: Building Momentum

By Carolyn Trotter, Chair, Sonography Canada

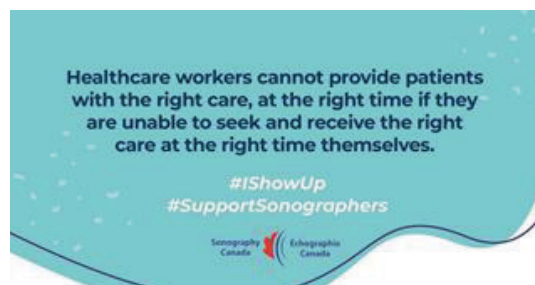
In the same way our profession uses sound waves to create images that help guide decision-making with respect to patient care, Sonography Canada uses its voice to 'make some noise' and 'create some waves' to help improve the image of our profession and influence the perception, decisions and actions of our members, fellow health-care professionals, governments, and the public. The momentum is building, and we are committed to keep that drive going into 2023!



Building on our advocacy campaigns in 2021, we added the #SupportSonographers and #IShowUp hashtags to highlight the ongoing commitment of our members and to demand better support to reduce key sources of ongoing physical and mental stress for sonographers in the workplace.



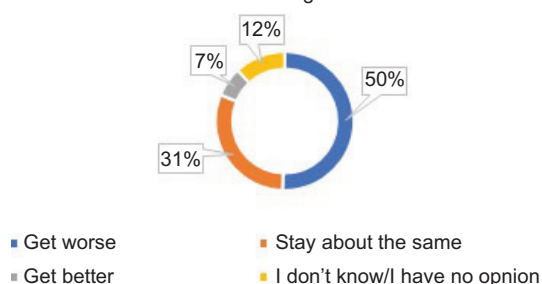
We also continued to discourage the creation and use of 3D entertainment ultrasound centres with our #ChooseHealthNotHype campaign. The key message conveyed through social media posts on Twitter and Facebook was that ultrasound examinations are medical procedures to be performed by trained health professionals, for medical reasons, not for fun.



What was fun, however, was the sight of so many members participating in our virtual CPD activities such as our webinar series, AGM/Education Day, and the annual SonoCon Summit. The sound of positive feedback regarding the quality of the speakers and the value of the content of those professional development opportunities was rewarding.

The voice of our members was heard loud and clear via the Membership Survey we conducted in 2022. It painted a very clear picture of the current strengths and challenges of our profession and highlighted a vision of a future marked with worry. You told us that we have some planning to do to address the shortage of sonographers, that member wellness must remain a key focus due to the sustained pressures that were exacerbated by the pandemic, and that we must continue to advocate for the recognition of sonography as a unique and specialized health-care profession.

Outlook for working conditions



These results provided Sonography Canada with the direction it needed to develop the association's strategic plan for 2023 to 2025. This new plan reaffirms our commitment to work to influence the health care system on behalf of sonographers. It emphasizes our plan to lead the continued progressions of

standards for diagnostic medical sonography to ensure the sustainability of the profession. It highlights our dedication to support members to thrive through all stages of their professional practice, and our pledge to build upon Sonography Canada's organizational development to enable efficiency and growth.

The challenges of the COVID-19 pandemic took their toll on all of us, but also led to exciting opportunities to do things differently, to embrace change, and to be innovative. For example, despite pandemic restrictions, our ability to pivot and offer virtual solutions allowed us to grant over 482 credentials to sonographers entering the profession in Canada.

A new role of Past Chair was added to the Board of Directors to ensure greater continuity, while new members assumed existing positions, bringing with them their fresh perspectives and enthusiasm.

The combination of new roles and new faces was not only seen at the Board level, but within the Sonography Canada National Office Team where Ms. Jody Guerin was promoted to the role of Membership and Education Coordinator and Jamie Szasz was welcomed as a new Certification Administrator. Doing so has allowed the association to build its capacity to deliver on its core functions: certification, continuing professional development, professional practice, and membership.

While limited progress was achieved in terms of regulating the profession of sonography across the country in 2022, the province of Alberta began to allow chiropractors, physiotherapists, and audiologists to refer patients for diagnostic imaging like X-rays and ultrasounds. As the scope of our profession continues to grow, along with the demand for our services, we will continue to adapt and respond accordingly.

To this end, partnerships remained a key focus for us as we aligned our efforts with those of fellow diagnostic medical imaging professional associations and organizations to advance our goals and strengthen our voice. Expect to see and hear more about initiatives like the one in November 2022, when Sonography Canada's Executive Director, Susan Clarke, and Professional Practice Manager, Tara Chegwin, joined representatives from the Canadian Association of Radiologists to advocate for increased government support for our members on Parliament Hill.

As an organization, we find inspiration around us and motivation within us. Success is like a snowball ... you have to get it going and the more you roll in the right direction, the greater it gets. Momentum is building and Sonography Canada remains steadfast in its commitment to members and to its mission to be the Canadian voice of diagnostic medical sonographers, fostering best practices and promoting the pursuit of excellence.

As we enter the Holiday season, I would like to seize this opportunity to thank you for being a Sonography Canada member. May you enjoy many blessings during this festive season and join us in looking forward to the New Year with great hope and anticipation of the opportunities that lie ahead.



Gamification of an Interdisciplinary Point-Of-Care Ultrasound Symposium and Its Perceived Impact on Learning

About the Authors

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ABSTRACT

Background

Point-of-care ultrasound (POCUS) is a valuable diagnostic tool for physicians across medical specialties. New methods to increase trainee exposure and comfort with POCUS are important to help integrate POCUS into post-graduate medical education. We assessed whether gamification of POCUS teaching through an interdisciplinary 1-day POCUS competition and symposium would increase learner comfort with core scans and whether participants perceived that the gamification and interdisciplinary nature of the event enhanced their educational experience.

Methods

Sonowars 2020 was a 1-day interdisciplinary POCUS competition open to all trainee physicians at two local teaching hospitals. Trainees participated in a mix of didactic and competitive sessions, where participants were adjudicated on their image acquisition, interpretation, visuospatial comprehension, and clinical judgement. Pre and post-event surveys using a 5-point Likert scale were developed to assess three domains: comfort with common scans, perceived impact of interdisciplinary structure on learning, and perceived impact of gamification on learning. In addition, ordinal regression was used to assess for an increase in comfort with common scans pre- and post-event.

Results

A total of 44 trainee physicians participated in the event. The response rate for the pre- and post-surveys was 39/44 (89%) and 38/44 (86%), respectively. The median (range)

post-graduate year of training was 1 (1–7). Ordinal regression showed an increase in comfort post-event for nearly all scans. Respondents indicated that the competition format enhanced learning, considering it more engaging than either lecture or small group format. One year post-event survey indicated that the majority of participants pursued further ultrasound training incited by *Sonowars*.

Discussion

Sonowars 2020 demonstrated that an interdisciplinary ultrasound symposium with low-stakes competition was associated with increased perceived comfort with POCUS amongst trainees and that its gamification and interdisciplinary format were perceived to enhance the educational experience. Furthermore, implementing POCUS into post-graduate medical training requires trainee engagement for uptake and integration into daily patient encounters. Therefore, exposing trainees to POCUS in a novel format like *Sonowars 2020* may provide a foundation for further POCUS skill acquisition among trainees.

Keywords: Diagnostic imaging; Gamification; Hospitals, Teaching; Internship and Residency; Education, Medical

Introduction

Point-of-care ultrasound (POCUS) is clinician-performed ultrasound to assess physiology at the bedside and diagnose abnormal pathology. This contrasts with consultative ultrasound, where images are acquired by a technologist or radiologist whose role is limited to the diagnostic test itself.¹ As the evidence supporting POCUS continues to increase, its use has grown across medical specialties, healthcare settings, and post-graduate residency training.^{1–9}

Various Canadian post-graduate residency programs are incorporating POCUS into core curricula. Some programs offer formal teaching with dedicated POCUS rotations, while others are still in their infancy.^{10,11} Several needs assessments performed by Canadian Emergency Medicine, Internal Medicine, and Family Medicine residency programs have highlighted a gap between the perceived need for training and implementation into post-graduate education.^{12–15} These assessments suggest that successfully adopting a POCUS curriculum requires an identified need for POCUS in clinical practice and trainee willingness to participate in training.

For many trainees, it may be difficult to fully grasp the potential applications of POCUS without the benefit of previous exposure. Gamification, or the process of incorporating elements of games (competition, point scoring, rewards), has been recognized as an effective tool to increase engagement with medical curricula.^{16,17} We hypothesized that an interdisciplinary trainee ultrasound competition *Sonowars 2020*, would engage trainees and increase their comfort with performing POCUS among post-graduate medical trainees.

Methods

The University of Ottawa Research Ethics Board waived approval for this study as it fell under a program evaluation activity.

Event Overview

Sonowars Ottawa 2020 was the second annual interdisciplinary POCUS competition for trainee physicians at The Ottawa Hospital and the Children's Hospital of Eastern Ontario. The first competition held in 2019 was a smaller event and program evaluation data was not collected. At registration, participants could select their own teams or register individually and be randomly allocated

to a team. *Sonowars 2020* consisted of team-based didactic challenges, small group teaching, and competition skills stations (see Appendix A for schedule). The first session of the day was an introductory 30-minute lecture on interdisciplinary POCUS use. This was followed by a 1-hour image recognition competition. Individual groups then proceeded to hands-on stations where they competed in 4 sequential challenges, testing their visuospatial skills, technical capability in image acquisition, pathology recognition, and procedural. Finally, the scores from the first two competitive sessions were summed and the top two teams competed in a final series of challenges assessing image acquisition and pathology recognition with low-fidelity simulation.

Survey Design and Collection

To improve the curriculum for future iterations of the event, pre- and post-event surveys with a 5-point Likert scale were administered. The surveys were designed through consensus discussion with 4 authors (RP, RU, EC, and JZ). The pre-event questionnaire surveyed the perceived importance of POCUS within the participant's medical specialty and their self-reported comfort with common scans (see Appendix 1). The post-event questionnaire surveyed the perceived importance of POCUS within the trainee's specialties, comfort with various scans, and the impact of the interdisciplinary format and gamification on learning POCUS [see Appendix B]. In addition, written feedback to improve the event was invited. The pre-event survey was administered the morning of the event before the introductory lecture. The post-event survey was administered after the competitive sessions but before the announcement of the finalist teams.

A one-year follow-up survey was also administered, designed through consensus discussion with seven authors (JZ, RU, EC, KD, JM, SM, RP). This survey endeavored to gauge the long-term impact of the one-day event, with both 5-point Likert scales and short-answer format questions employed.

Data Analysis

All data were stored in Microsoft Excel 2013 (Washington, USA). R Software for Statistical Computing v.3.6.1 (Vienna, Austria) was used for all statistical analysis.¹⁸ Descriptive statistics were used where applicable. For Likert values, the median with interquartile range (IQR) were provided, with missing responses omitted from the analysis. Ordinal logistic regression was then used to determine if attending *Sonowars 2020* significantly changed participants' perceived comfort with performing and interpreting POCUS scans. A positive regression coefficient implies that participants were likelier to agree on a survey question after *Sonowars 2020* than before. A Bonferroni correction for multiple comparisons was used. Statistical significance was set at a p-value of less than 0.05, and 95% confidence intervals were provided where appropriate. Missing responses were omitted from the analysis.

Results

Participants

Sonowars 2020 was attended by 44 trainees, including residents (post-graduate year 1–5) and fellows (post-graduate year 6+) who formed 15 teams of 3 participants (one team of 2 participants). Attendees represented 11 different training programs: internal medicine, emergency medicine, family medicine, radiology, electrophysiology, pediatric medicine, psychiatry, orthopedic surgery, nephrology, hematology, and respiratory. Thirteen faculty members attended the event as instructors or facilitators, and 15 medical student volunteers attended as standardized patients.

Survey Demographics

The survey response rate was 39/44 (89%) for the pre-event survey, 38/44 (86%) for the post-event survey, and 8/44 (18%) for the one-year follow-up. Twelve of the respondents (30.8%) were completing a second residency or fellowship program, whereas the remaining 27 (69.2%) were completing core (entry-level) residency programs. The median post-graduate year was 1 (range 1–7). The median baseline POCUS use among trainees was

1/5 ("Rarely," IQR 1–2). The median response to the question about whether POCUS was considered essential to their practice was 3/5 ("Neither agree nor disagree," IQR 3–4).

Comfort with image acquisition and interpretation

Respondents reported a significant increase in comfort for both image acquisition and interpretation for several scans (Table 1, Figure 1). Specifically, participants felt more comfortable independently acquiring parasternal long, subxyphoid, inferior vena cava, focused assessment in trauma (FAST), and pulmonary views. Participants also felt more comfortable independently assessing for regional

wall motion abnormalities, pneumonia, pneumothorax, pericardial effusion, pulmonary edema, hydronephrosis, free fluid in the abdomen, and acute choledocholithiasis.

Evaluation of educational experience

Participants identified that the competition format enhanced learning (median 4/5, "agree"), was more engaging than lecture format (median 5/5 "strongly agree"), and was more engaging than small group teaching (median "agree"). In addition, they found that interactions with interdisciplinary faculty and trainees enhanced learning (median 4.5/5 "agree/strongly agree", median 4/5 "agree", respectively), and that they developed an

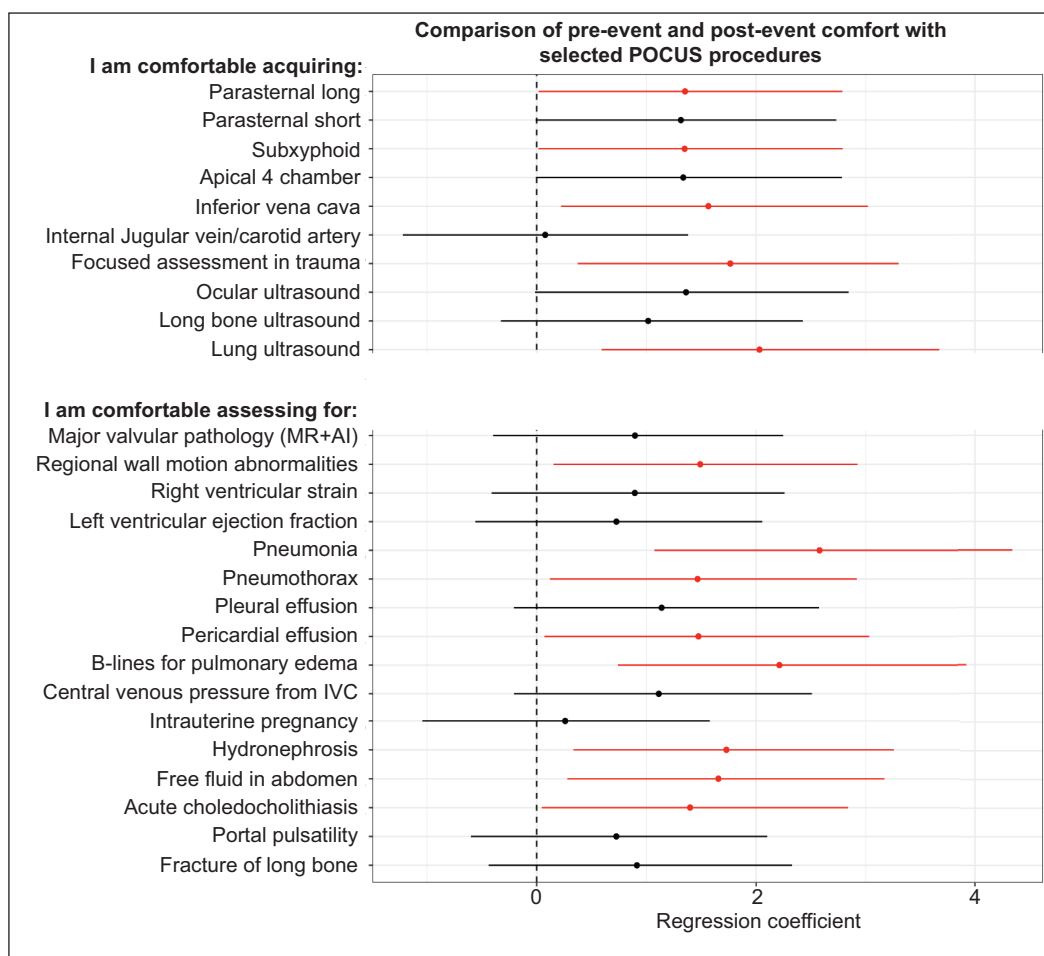


Figure 1. Ordinal logistic regression for pre- and post-event self-reported comfort with image acquisition and interpretation for various POCUS scans.

Table 1. Comfort with Image Acquisition and Interpretation for Basic and Advanced Scans, Before and After An Interdisciplinary Gamified Point-Of-Care Ultrasound (POCUS) Event.

Survey Question:	Pre-Event Score [median, (IQR)]	Post-Event Score [median, (IQR)]	Regression Co-efficient [Bonferroni-adjusted 95% CI]	P-Value
I am comfortable independently acquiring views for:				
1. Parasternal Long Axis	3 (1.5–4)	4 (4–4)	1.35 [0.02–2.79]	0.043
2. Parasternal Short Axis	3 (1.5–4)	4 (3.25–4)	1.31 [–0.01–2.73]	0.054
3. Apical 4 chamber view	3 (1.5–4)	4 (4–4)	1.34 [–0.01–2.78]	0.052
4. Subxiphoid view	3 (2–4)	4 (4–5)	1.35 [0.01–2.79]	0.045
5. Inferior vena cava ultrasound	3 (2–4)	4 (3–4.75)	1.56 [0.22–3.02]	0.008
6. Lung ultrasound	3 (2–4)	4 (4–5)	2.03 [0.59–3.67]	<0.001
7. Focused Assessment in Trauma (FAST)	3 (2–3.5)	4 (4–4)	1.77 [0.375–3.30]	0.002
8. Extremity ultrasound of Long Bone	1 (1–2)	2 (1–3)	1.02 [–0.326–2.42]	0.496
9. Ocular Ultrasound	1 (1–2)	2 (1–3)	1.36 [–0.02–2.84]	0.056
10. Inferior vena cava + carotid artery	4 (2.5–5)	4 (3–5)	0.08 [–1.22–1.379]	1.000
I am comfortable independently using ultrasound to assess for:				
1. LV Ejection Fraction (global assessment)	2 (1–4)	3 (2–4)	0.73 [–0.56–2.06]	1.000
2. Right Ventricular Strain	2 (1–3)	3 (2–3)	0.89 [–0.41–2.26]	0.889
3. Pericardial Effusion	4 (2–4)	4 (4–5)	1.47 [0.07–3.03]	0.029
4. Major Valvular Pathology (mitral regurgitation and aortic insufficiency)	2 (1–3)	3 (2–4)	0.90 [–0.40–2.25]	0.836
5. Regional Wall Motion Abnormalities	2 (1–3)	4 (2–4)	1.49 [0.15–2.93]	0.014
6. Pneumothorax	3 (1–4)	4 (3–4)	1.47 [0.12–2.92–]	0.018
7. Pleural Effusion	4 (2–4)	4 (4–5)	1.14 [–0.21–2.57]	0.231
8. Pneumonia	2.5 (1–3)	4 (3–4)	2.58 [1.07–4.34]	<0.001
9. B-lines for Pulmonary Edema	3 (2–4)	4 (4–5)	2.21 [0.74–3.92]	<0.001
10. Fracture of a Long Bone	1 (1–2)	2 (1–3)	0.91 [–0.44–2.33]	0.947
11. Free Fluid in right upper quad	3 (2–4)	4 (4–5)	1.65 [0.28–3.17]	0.005
12. Intrauterine Pregnancy	2 (1–3.75)	2 (1–4)	0.26 [–1.04–1.58]	1.000
13. Interpretation of IVC for estimate of central venous pressure	2 (1–3)	3 (2–4)	1.11 [–0.21–2.51]	0.236
14. Portal vein pulsatility for venous congestion	2 (1–2)	2 (1–3)	0.73 [–0.60–2.10]	1.000
15. Biliary ultrasound for acute cholecystitis	2 (1–3)	3 (2–4)	1.40 [0.05–2.84]	0.035
16. Acute hydronephrosis	2 (1–3)	4 (3–4)	1.73 [0.34–3.26]	0.003

increased appreciation for how POCUS could be used in other specialties from their own (median 5/5, “strongly agree”).

In a follow-up survey one year after the event, 63% of respondents indicated that they have further

pursued POCUS training and that Sonowars provided an incentive for pursuing such training. In addition, these respondents noted that Sonowars improved their confidence with ultrasound and that they could better appreciate the broad applicability of POCUS as an add-on to clinical practice.

Discussion

Sonowars 2020 was a one-day event designed to foster a collaborative ultrasound culture, expose post-graduate trainees to the breadth of POCUS, and teach trainees new skills. Based on survey responses, the attendees' self-reported comfort with several core scans and appreciation for the scope of POCUS increased. Scans that showed no significant change in comfort from the event were from trainees pursuing stations most aligned with their learning, either from irrelevance (ex: orthopedic residents and retinal ultrasound) or previously achieved proficiency (ex: cardiology EP fellows and cardiac ultrasound, for example). As well, the interdisciplinary and gamification components were well received and were felt to enhance the learning.

Gamification uses game design elements in non-game contexts to increase motivation and impact behavioural outcomes.¹⁹ In the field of education, gamification has been studied extensively.¹⁶ A systematic review by Hamari et al.²⁰ suggests that while the study of gamification lacks well-established theoretical frameworks as well as a paucity of evidence towards true educational gains compared to traditional teaching, gamification effectively engages learners and improves knowledge acquisition. Although not widely adopted in medical education,²¹ some studies demonstrate positive results. One center experienced an up to a 58-fold increase in the use of their da Vinci simulator for minimally invasive surgeries two weeks after the tournament announcement comparing trainee skills.²² Another center described considerable improvement in vascular surgery trainee skills with end-to-end anastomosis simulated surgeries after implementing a gamification system.²³ One Emergency Medicine program effectively taught its trainees mindful cost-conscious care using gamification techniques to enhance engagement in learning.²⁴

Our implementation of gamification in the low-stakes competition format of *Sonowars 2020* successfully engaged trainees. Of the 44 participants, 12 provided written feedback, of which six

explicitly commented on the excellence of the format. Trainees felt significantly more comfortable with multiple scans of different organs after a single-day event, and participants overwhelmingly agreed that the format improved upon didactic and small-group teaching. One year after the event, a post-event survey provided similar feedback, with the majority of survey respondents agreeing that inspired further pursuit of additional POCUS skills. This is in keeping with previous research in medical education emphasizing gamification's efficacy, particularly in enhancing procedural skills.^{24,25} In addition to potential benefits from trainee engagement, the interprofessional format with trainees and faculty from various specialties may have played an additional role in creating a more cohesive post-graduate trainee community, consistent with previously demonstrated benefits of interprofessional education.²⁶ Participants at our event endorsed that exposure to other specialties garnered an increased appreciation for these other specialties and a heightened sense of collegiality among co-trainees.

As POCUS continues to integrate into the post-graduate residency curriculum, residency programs have identified significant gaps.^{12,13,14,27} In attempting to fill these gaps, different structures have been implemented, including multi-day events or boot camps,²⁸ integrated curricula in residency programs,²⁹ curricula delivered online,³⁰ POCUS rotations,³¹ or even dedicated POCUS fellowships.³² The success of any of these models relies on trainee interaction and a perceived value to implementing POCUS into practice. *Sonowars 2020* highlights that a relatively low budget (<\$2000 CAD) single-day event may help improve trainee appreciation for the scope of POCUS and improve comfort in image acquisition and interpretation. In particular, the competition format and interdisciplinary nature may help increase trainee engagement.

Limitations

There are several limitations to this preliminary study. Firstly, although trainees self-reported

their comfort, no objective measurement of skill or performance was taken to assess whether the participants POCUS skills objectively improved. A significant selection bias is likely present as this event was extra-curricular, and those trainees with positive attitudes towards POCUS were likely to attend the event. An observation bias is likely at play where trainees feel appreciative of attending the event and may have responded more favorably in the post-event survey. Finally, there were several non-respondents to all three surveys, so a selection bias may have been present, where trainees already engaged in POCUS or medical education may have been more likely to respond.

Conclusion

Although POCUS has seen a rapid uptake across medical specialties, its integration into post-graduate residency training is an active research area. Successful implementation requires trainee engagement, which an interdisciplinary and gamified event like *Sonowars 2020* might provide. Future research into whether gamification objectively improves ultrasound skill acquisition and retention is warranted, as is future research into the impact of interdisciplinary education on teaching POCUS.

Disclosures

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Conflicts of Interest

There are no conflicts of interest to declare.

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Article Title: Gamification of An Interdisciplinary Point-Of-Care Ultrasound Symposium and Its Perceived Impact on Learning: A Cross-Sectional Survey

Authors' Names: Jimmy Zhang, MD; Rudy R. Unni, MD; Emily Curly, MD; Kayla Dadgar, MD; Sang Woo Park, BSc, MA. Princeton University; Jerry Maniate, MEd, MD; Samantha Halman, MEd, MD; Ross Prager, MD

1. What is gamification in medical education?

- a. The use of video games to teach medical concepts
- b. The process of incorporating elements of games (competition, point scoring, rewards) into medical education
- c. The study of the effects of video game playing on medical students
- d. The use of gaming technology to create virtual anatomy simulations

2. What is the main purpose of gamification in medical education?

- a. To increase motivation and improve behavioural outcomes
- b. To enhance engagement in learning
- c. To improve knowledge acquisition
- d. All of the above

3. What was one of the main goals of the Sonowars 2020 event?

- a. To improve trainee comfort with core POCUS scans
- b. To expose trainees to the limited use of POCUS
- c. To spark competition between different specialties
- d. To enhance the teaching abilities of POCUS experts

4. What did the post-event survey reveal about trainee engagement with POCUS after Sonowars 2020?

- a. The majority of respondents reported no further pursuit of additional POCUS skills
- b. The majority of respondents reported increased engagement in POCUS training
- c. The majority of respondents reported decreased engagement in POCUS training
- d. The majority of respondents reported no change in engagement in POCUS training

5. What did the survey responses indicate about the attendees' comfort with several core scans after the event?

- a. No significant change in comfort
- b. A decrease in comfort
- c. A significant increase in comfort
- d. A slight increase in comfort

APPENDIX A

Outline of Sonowars 2020 day

8:00 – 8:30 AM	Registration and Snacks
8:30 – 9:00 AM	Welcoming Remarks + Opening Lecture <ul style="list-style-type: none"> • Dr. Mir Ghassemi
9:00 – 10:00 AM	Competitive Round #1: Pub-Trivia Challenges <ul style="list-style-type: none"> • Dr. Rob Suttie • Pub-trivia style challenge, with different questions and cases brought up on a projected screen • Faculty Discussion on POCUS and Radiology (Dr. Rakhra)
10:00 – 12:15 PM	Small Group Teaching and Competitive Round #2 <ul style="list-style-type: none"> • Held in the Large-Skills Room. Teams will be paired with simulated patients and faculty for small-group teaching • 4 teams at a time will be brought to the competition room to rotate through rapid-fire 6 minute challenges <ul style="list-style-type: none"> • Scavenger Hunt: 6 minutes to find as many views as possible on your SP: Rubric in your folder! • TTE Simulator: 1 minute to find each pathology (lung, abdomen, heart) • 3D Visuospatial challenge: 6 minutes to complete 3 challenges in object identification and procedural skill (venous access simulation) • Drawing challenge – 6 minutes to complete 8 sketches of POCUS anatomy + pathology
12:15 – 1:00 PM	Lunch + Networking
1:00 – 2:00 PM	Competitive Session #3: Finals <ul style="list-style-type: none"> • Head-to-Head, case-based, knowledge and technical skill testing challenges! • Winner will receive prizes and glory!
2:00 PM	Closing Remarks + Thank You

APPENDIX B

Pre-Sonowars 2020 Survey

Demographics:

PGY level (if fellow, just write fellow): _____	Specialty (optional): _____
Birth month + first 3 letters of mother's first name: (For anonymous tracking. For example, 12Jes)	_____

Use in clinical Practice - The following questions gauge the frequency by which you use POCUS in clinical practice:

POCUS use is currently essential to my clinical practice				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
In my clinical practice, I use POCUS				
Less than once a month	1–3 times a month	Several times a month	Several times a week	Every shift
1	2	3	4	5

Comfort - The following questions gauge your comfort to independently perform various POCUS scans.

I am comfortable independently **acquiring views** for:

Parasternal Long Axis view				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Parasternal Short Axis view				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Apical 4 chamber view				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Subxiphoid view				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
IVC ultrasound				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Lung ultrasound				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Focused Assessment with Sonography in Trauma (FAST) exam				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Extremity ultrasound of long bone				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Ocular ultrasound				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Ultrasound of the internal jugular vein + carotid artery				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

I am comfortable independently using ultrasound **to assess for:**

Left Ventricular Ejection Function (global assessment)				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Right Ventricular Strain				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Pericardial Effusion				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Major Valvular Pathology (mitral regurgitation + aortic insufficiency)				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Regional Wall Motion Abnormalities				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Pneumothorax				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Pleural Effusion				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Pneumonia				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
B-lines for Pulmonary Edema				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Fracture of a long bone				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Free fluid in RUQ/LUQ/Pelvis				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Intrauterine Pregnancy				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Interpretation of IVC for an estimate of central venous pressure				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Portal Vein Pulsatility for venous congestion				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Biliary Ultrasound for acute cholecystitis				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Post-Sonowars 2020 Survey

Demographics:

PGY level? _____	Specialty? _____
Birth month + first 3 letters of mother's first name: (For anonymous tracking. For example, 12Jes)	_____

Game-ification: The following questions assess the impact that the competition format of Sonowars had on your learning experience

I found that the competition format enhanced my learning				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
I found that the competition format kept me more engaged than lecture format				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
I found that the competition format kept me more engaged than small group teaching				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Interdisciplinary learning: The following questions assess the interprofessional nature of Sonowars 2020

I found that interacting with faculty from various specialties enhanced my learning				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
I found that interacting with residents from various specialties enhanced my learning				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
I have an increased appreciation for how POCUS may be used in medical specialties besides my own				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Comfort: The following questions gauge your comfort to independently perform various POCUS scans.
I am comfortable independently **acquiring views** for:

Parasternal Long Axis view				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Parasternal Short Axis view				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Apical 4 chamber view				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Subxiphoid view				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
IVC ultrasound				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Lung ultrasound				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Focused Assessment with Sonography in Trauma (FAST) exam				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Extremity ultrasound of long bone				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Ocular ultrasound				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Ultrasound of the internal jugular vein + carotid artery				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

I am comfortable independently using ultrasound to assess for:

Left Ventricular Ejection Function (global assessment)				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Right Ventricular Strain				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Pericardial Effusion				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Major Valvular Pathology (mitral regurgitation + aortic insufficiency)				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Regional Wall Motion Abnormalities				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Pneumothorax				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Pleural Effusion				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Pneumonia				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
B-lines for Pulmonary Edema				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Fracture of a long bone				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Free fluid in RUQ/LUQ/Pelvis				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Intrauterine Pregnancy				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Interpretation of IVC for an estimate of central venous pressure				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Portal Vein Pulsatility for venous congestion				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5
Biliary Ultrasound for acute cholecystitis				
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	2	3	4	5

Feedback: The following session is for feedback to this year's event, and will help us guide the format of future events:

29. What should we keep doing?
30. What should we stop doing?
31. What should we start doing?

Severe Septal Hypertrophy in a Young Asymptomatic Female

About the Author

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ABSTRACT

Hypertrophic cardiomyopathy is the most common cause of death in young people, with a ratio of 1/500 in the general population, whilst focal left ventricular thickening with no family history is rare. This 23-year-old female presented with asymptomatic severe concentric hypertrophy of an unknown source, suspected to be caused by cardiomyopathy. The echocardiogram showed a severely thickened septal and anterolateral wall consistent with non-obstructive hypertrophic cardiomyopathy (HCM); there is no known family history of cardiomyopathies, and upon further investigation of the echocardiographic images, the thickening appeared analogously with a cardiac tumor in the septal wall rather than cardiomyopathy. The differential diagnosis, in this case, was that there was a non-obstructive HCM, but that further imaging would be required for confirmation. This case emphasizes the importance of conducting an echocardiogram on all patients with abnormal electrocardiograms regardless of their symptomology.

Introduction

Studies have found hypertrophic cardiomyopathy (HCM) to be more common than initially suspected occurring in 1/500 of the general population. Meanwhile, finding idiopathic focal left ventricular thickening with no family history is still relatively uncommon. HCMs are associated with inherited genes that lead myocardial cells to abnormally increase in size due to cells replicating very fast or growing irregularly.¹ This type of cardiomyopathy can be caused by more than 1400 mutations in

over 11 genes that encode for cardiac sarcomeres.¹ Unfortunately, HCMs are the most frequent cause of sudden death in young people.¹

A cardiac condition rarer than idiopathic cardiomyopathy is a cardiac tumor. Due to the uncommon nature of cardiac tumors, we have significantly less clinical data on their existence, risks, effective treatments, and causes.² Epidemiological research shows the prevalence of cardiac tumors to be 0.001–0.3% of the population.³

Whether the septal thickening is caused by a cardiomyopathy or a cardiac tumor, this case presents unique circumstances and echocardiographic findings. This female patient was young, asymptomatic, and had no known family history of cardiac conditions, which don't typically correlate to severely thickened heart walls. This case challenges the echocardiographers assessment capabilities and helps differentiate between two similarly appearing abnormalities that would result in very different diagnosis, treatment and management plans.

Case Description

A 23-year-old physically healthy female was being treated for a mental health condition, while receiving treatment, she underwent an electrocardiogram (ECG), indication for this test was unknown. The ECG showed ST elevation suggesting a myocardial infarction; this patient was asymptomatic and had no other signs or symptoms of a myocardial infarct. This patient was referred to the hospital to complete an echocardiogram (echo) to assess the structure and function of her heart. The echo showed asymmetric septal hypertrophy with anterolateral involvement which can be seen in Figures 1, 2, and 3. The echocardiogram reported a normal-sized left ventricle, with normal ejection fraction (61% by Simpson's biplane), and a dilated

left atrium with an intact interatrial septum. The septal wall measured 19 mm in diameter with relative wall thickness of 0.33 and left ventricular mass index as 128.6 grams/ μ^2 (Figure 1). The echo showed mild mitral regurgitation involving a mildly thickened mitral valve with mild systolic anterior motion (SAM) (Figures 1–5). Though the patients mitral valve showed SAM, there were no signs of left ventricular outflow tract obstruction (LVOTO). The tricuspid valve was structurally normal, and

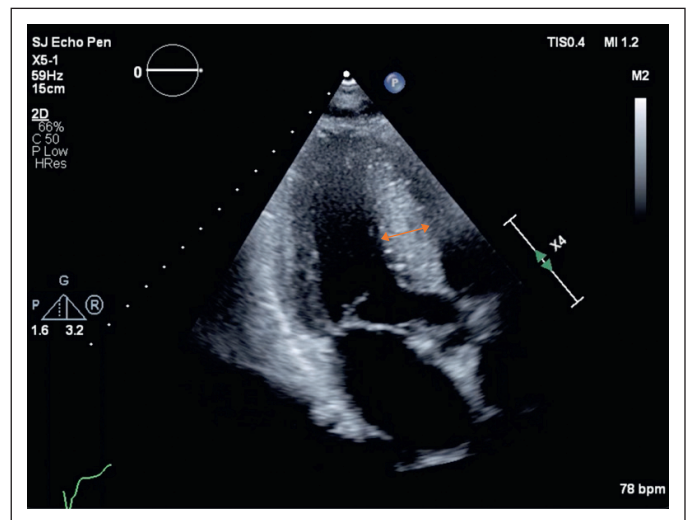


Figure 2. Apical 3 view (long axis) at mid-systole showing anterolateral wall thickening.

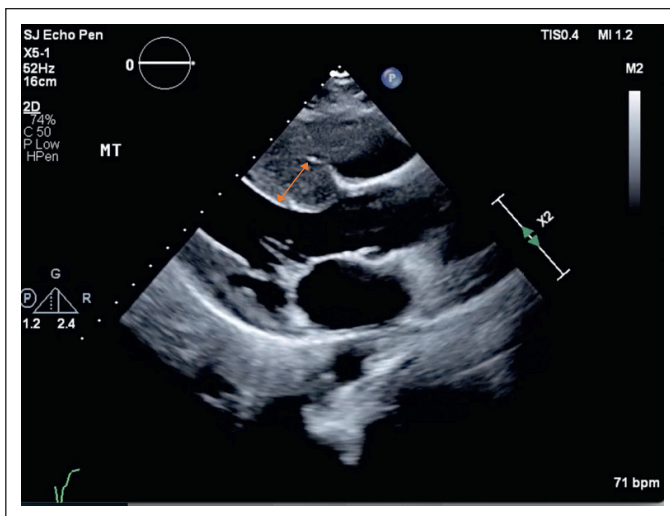


Figure 1. Parasternal long axis in mid-systole showing severely thickened septal wall.

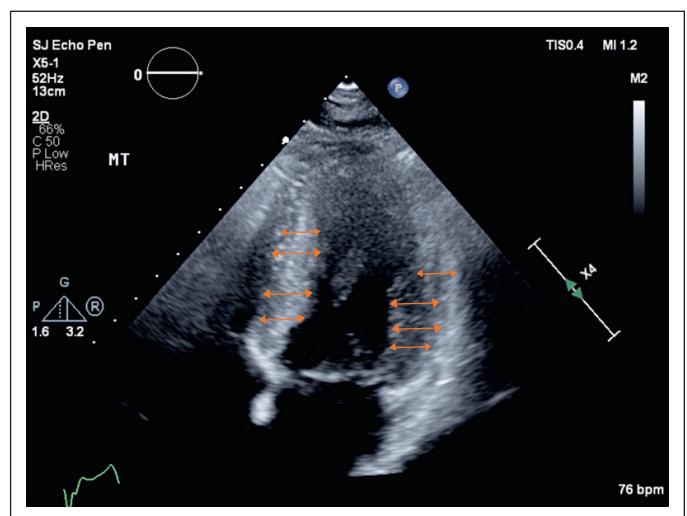


Figure 3. Apical 4 view at end-systole showing septal wall thickening.

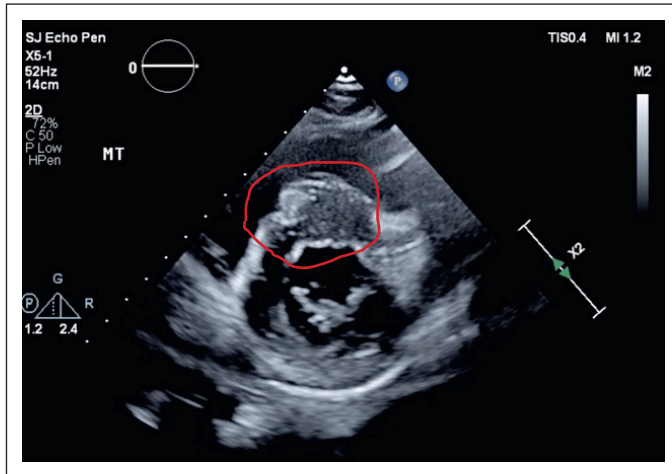


Figure 4. Parasternal short axis showing indication of possible cardiac tumor in the anteroseptal wall segment.

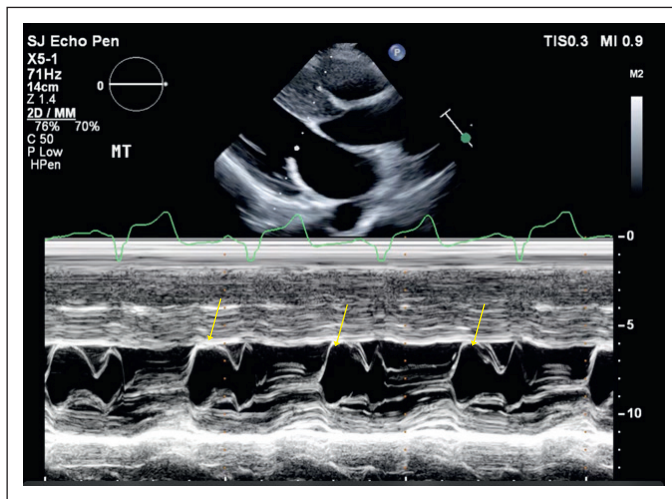


Figure 5. M-mode at mitral valve level showing systolic anterior motion (SAM).

the right ventricle and right atrium were normal in size. Trace tricuspid regurgitation was found too insufficient to calculate right ventricular systolic pressure. The patient's aortic valve was trileaflet and opened well, with no aortic regurgitation. Based on the echocardiography results, the cardiologist's report concluded that the left ventricular thickening was likely non-obstructive HCM, but recommended to the patient's primary care provider that further imaging would be required for a confirmatory diagnosis.

The staff cardiologist referred the patient for an outpatient cardiac magnetic resonance imaging (MRI). The cardiac MRI results were not available to the author since the patient was referred to a different site. When the cardiac MRI is completed, the patient's treatment plan will be confirmed depending on the source of the left ventricular thickening.

Discussion

HCMs can be severe and life-threatening cardiac conditions; the best patient outcomes are supported by early detection. HCMs can present as spontaneous mutations fifty percent of the time and associated with family history the rest of the time.² HCM are often followed by the onset of a heart murmur or an abnormal 12-lead ECG finding.¹ Diagnosis of HCM can be through electrocardiogram, echocardiogram, cardiac MRI or cardiac computed tomography, exercise tests, rhythm diagnosis, and invasive diagnostics tests such as a cardiac biopsy or any combination of the following.² Symptoms of HCMs are typically dyspnea and angina pectoris when the patient is under stress which can cause dizziness, palpitations, and occasionally syncope.² Physical findings of HCM can include: a fourth heart sound heard on auscultation due to increased atrial pressures, obstructive hypertrophy can cause a systolic murmur, Noonan's syndrome (facial dysmorphism) or Anderson-Fabry disease (typical maculopapular skin lesions) which are associated conditions.²

Clinical outcomes of HCMs include sudden death, heart failure, left-ventricular outflow obstruction, atrial fibrillation, and diastolic dysfunction.¹ The natural history and clinical course of progression of HCMs can be seen in Figure 6.¹ The natural progression of HCMs typically starts with a genetic mutation, is symptomless, and then develops the risk of mild to severe side effects ranging from atrial fibrillation to sudden death or heart failure.¹

Treatment of HCM will depend on the severity of the left ventricular thickening, how early the HCM was detected, and the type and severity of symptoms. Table 1⁴ from the Prinz et al. study gives a

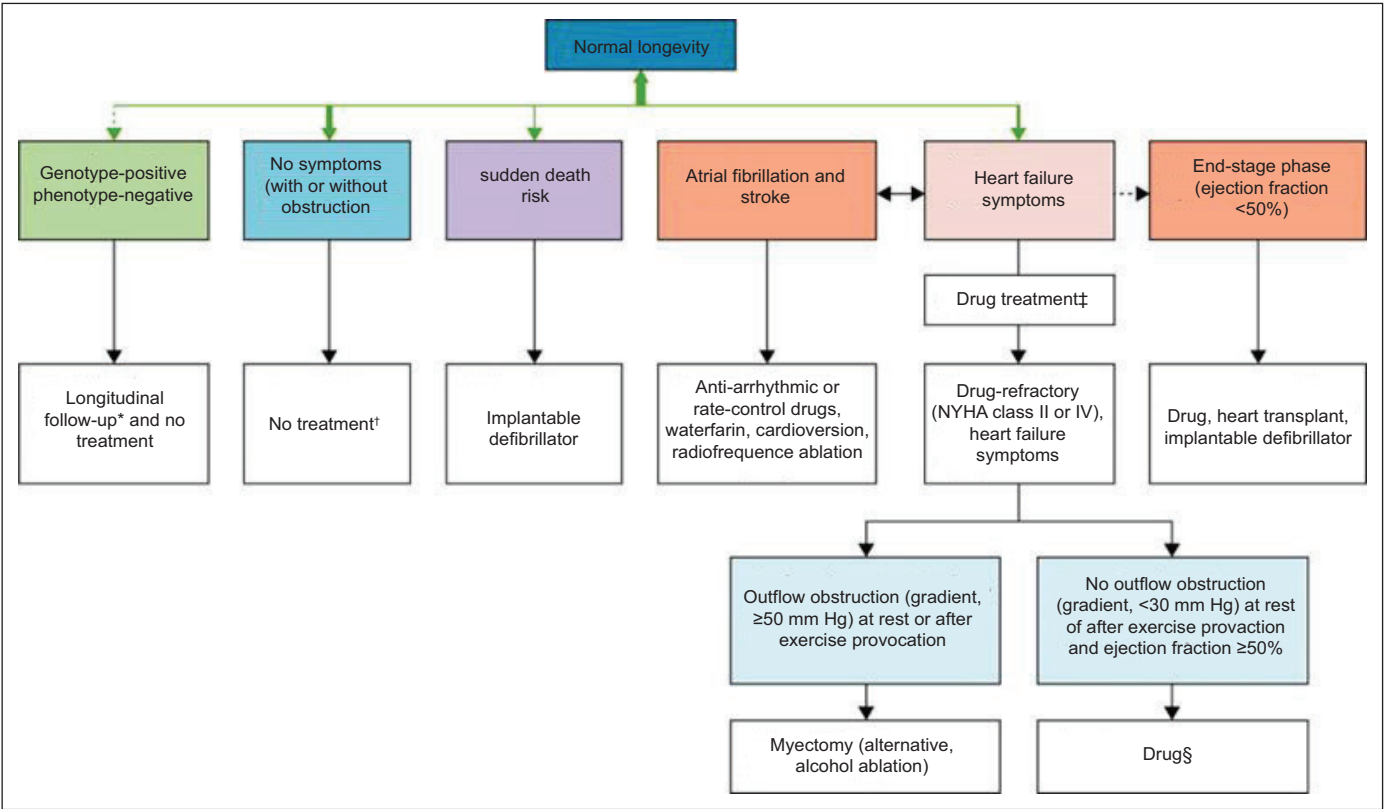


Figure 6. Prognostic pathways and primary treatment strategies for various presentations of hypertrophic cardiomyopathy.¹

Table 1. Algorithm To Identify At-Risk HCM Patients for Implantation with an ICD 25⁴

First degree risk factors	Definition
Positive family history of sudden cardiac death	Cases with SCD <45 years
Recurrent syncope	≥2 incidents
LVH	≥30 min at any site in the LV
Abnormal blood pressure response during exercise	Increase <20 mm Hg or fall >20 mm Hg after transient increase
Non-sustained VT in Holter ECG	≥3 consecutive QRS complexes with a heart rate of ≥120 bpm
Second degree risk factors	
Atrial fibrillations/atrial flutter LA dilatation High LVOT gradient at rest. Evidence of myocardial ischemia during exercise.	Any form, provided cannot be eliminated >45 mm (in m-mode ECG) >80 mm Hg (CW Doppler)
Early manifestation of HCM Myocardial bridging near the LAD Marked fibrosis cardiac MRI	<30 years of age in younger patients (<45 years) fibrosis of ≥2 segments in a 17-segment model of the LV

SCD: sudden cardiac death; LVH: left ventricular hypertrophy; LA: left atrium; LV: left ventricle; LVOT: left ventricular outflow tract; VT: ventricular tachycardia; LAD: left anterior descending artery

good overview of the algorithm often used to identify high-risk HCM patients, which can help determine how urgent and invasive the treatment needs to be. Treatments for HCMs can include longitudinal follow-ups to track progress, implantable defibrillator, anti-arrhythmias or rate-control

drugs, warfarin, cardioversion, radiofrequency, and heart transplant.¹ Transthoracic echocardiography (TTE) is a critical tool in cardiac diagnostics and may be recommended in cases where other imaging has been

inconclusive. TTE assess the structure and function of the heart. If the TTE is inconclusive a cardiac CT/ MRI or transesophageal echocardiogram (TEE) may be recommended to confirm the pathology.⁴ Research has found the four main pitfalls of TTE can fall into these categories: masses and mass mimicking artifacts and tissues, poorly visualized apical lesions, evaluation for ascending thoracic aortic dissections, and pericardial diseases.⁵ This case falls into the first category. Though TTE is an excellent baseline assessment for structure and function, it can be difficult to differentiate and confirm the presence of a cardiac mass because it is common for mass-mimicking artifacts and tissues to cause the results to be inconclusive. In this case, the thickening in most views appears to be caused by hypertrophy, yet at some angles, specifically the parasternal short axis (Figure 4), it appears like the thickening is a rounded structure embedded in the myocardium like a cardiac tumor.

A cardiac MRI or CT is often required to confirm the true tissue texture and cause of thickening. A study comparing cardiac CT and echo calculations for left ventricular mass and wall thickness found that the echo measurements were higher than the CT measurements suggesting that they overestimated the true thickness and mass.⁶ There is a growing reliance and importance of multimodality imaging for diagnosing HCM.⁷ In the past, diagnosis of HCM relied upon clinical evaluation and echo results, but more and more cases, such as this one, are finding the technical limitations of echo difficult to rely on fully for diagnosis.⁷ Cardiac MRI has emerged as a useful complimentary assessment to confirm TTE results.⁷ Differentiating the type of tissue causing ventricular thickening is vital for proper treatment. In this case, it would be critical to verify if the thickening is caused by a cardiomyopathy or a cardiac tumor. The patient's risk, treatment options, and outcomes will drastically differ based on the cause of the thickening. This is one of a growing number of cases requiring multimodality imaging to draw a conclusive diagnosis.

Conclusion

This asymptomatic, young female patient was referred for a cardiac ultrasound due to an abnormal ECG finding that showed ST elevation suggesting a myocardial infarction. On the cardiac ultrasound examination, a severe focal septal thickening was identified, but a definitive diagnosis could not be made, and the patient was referred to have a cardiac MRI to confirm the diagnosis of thickening versus a mass. This case emphasizes that all patients, asymptomatic and symptomatic with an abnormal ECG, should have a follow-up echocardiogram and other diagnostic imaging if the cardiac ultrasound is not confirmatory of the diagnosis. This patient was fortunate that an echocardiogram was done, and the abnormality was picked up and followed up since non-diagnosis may have resulted in some dire consequences for the patient. Cases like this one challenge the sonographer and highlight the importance of multimodality imaging for diagnostics. Using cardiac CT and MRI in combination with TTE is shown to be critical for confirmation of diagnosis. More research should be done to understand the most efficient and effective protocol for diagnosing ventricular thickening.

Disclosure

The case report was written, and the images were taken by the author while on clinical placement (CP1) at St. Joseph's Hospital Unity Health Network.

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Article Title: Severe Septal Hypertrophy in a Young Asymptomatic Female Case Report

Author Name: Meghan Tucker, Cardiac Sonography Student at Mohawk College, St. Joseph Health Centre Unity Health Toronto, Toronto, Ontario, Canada.

1. How many types of mutations, coding for cardiac sarcomeres, can result in an HCM?
 - a. 1400 mutations in over 11 genes
 - b. 2500 mutations in around 20 genes
 - c. 1000 mutations in only 1 gene
 - d. 100 mutations in 5 genes
2. Why is it important to screen for cardiomyopathies early if there is known family history?
 - a. Because HCMs are y chromosome linked, so if a father has a HCM the son will likely have one too
 - b. Because 50% of HCMs are related to family history and best patient outcomes are supported with early detection
 - c. Because having known family history of cardiac conditions will increase a patient's chances of developing of HCM
3. What other imaging modalities should not be used to diagnosis HCM if the echocardiogram is inconclusive?
 - a. MRI CT
 - b. Cardiac CT
 - c. Angiogram
 - d. Transesophageal echocardiogram (TEE)
4. What is a severe complication caused by a HCM in a young person?
 - a. Sudden death
 - b. Jugular vein distension
 - c. Pulmonary hypertension
 - d. Need for a heart transplant
5. Transthoracic echocardiogram is an excellent baseline assessment for structure and function of the heart, but it has a high probability of
 - a. Allergies from contrast
 - b. Sonographer variability
 - c. Poor tolerance by the patient
 - d. Erroneous diagnosis due to mass mimicking artifacts

Delivering On What You Need 2023–2025 Strategic Plan

By Susan Clarke, MBA, Executive Director, Sonography Canada

As a professional association, Sonography Canada is accountable to its members. What this means is that you — our members — determine whether we are successful or not. You decide if we are doing the right things; and if we are doing them well. You decide, based on our activities, whether we are providing member value. So, as Executive Director of Sonography Canada, I always remind myself and the national office team that: ***When membership is voluntary; a focus on member needs is mandatory.***



This is the statement that guided our strategic planning process. Discussion essentially revolved around answering the following two questions “What do our members need?” and “How can we meet that need?”.

In the last edition of the CJMS (Volume 13, Issue 2, 2022), I highlighted the results of the 2022 Sonography Canada Membership Survey and emphasized the three A's of the initiative which were to ASK, ANALYZE and ACT. The questionnaire was the ‘ASK’ portion of the project. The last CJMS article was the ‘ANALYZE’ portion, summing up the key conclusions of the survey. The strategic planning process is entirely focused on how the association plans to ‘ACT’ on what we’ve learned. And this, is the focus of this article.

Step 1: Translating Conclusions Into Needs

We arrived at five key conclusions from the analysis of the 2022 Membership Survey results:

1. **We have some succession planning to do.** With the number of members contemplating career changes and retirements outpacing the number of students choosing to study sonography, the profession is left with an important shortfall of sonographers to meet the demand for services.
2. **Member wellness must remain a key focus.** With a majority of members expressing concerns about workplace injuries, increased productivity demands, as well as general stress and burnout, careful consideration must be given to job conditions.
3. **The pandemic exacerbated the sustained pressure on sonographers.**
4. **You confirmed that Sonography Canada offers strong membership value.**
5. **We must continue to advocate for the recognition of sonography as a unique and specialized healthcare profession.**

These conclusions were an expression of the issues, concerns, and desires of the membership. The strategic planning process involved translating these conclusions into member **needs** so we could identify the **actions** Sonography Canada could take to address them. This is what we believe we heard from our members:

1. We (the Canadian healthcare system) **NEED** more sonographers.
2. We **NEED** to improve the working conditions (physical and mental) in the healthcare facilities we work in.
3. We **NEED** to improve employer/colleague expectations of us.
4. We **NEED** professional liability insurance, training, as well as national guidelines and credentials.
5. We **NEED** Sonography Canada to continue to speak up for us.

With the key needs identified, we launched into a strategic planning process with the aim to answer one question: “What is Sonography Canada going to do about it?”

Step 2: Translating Needs Into Action

Sonography Canada serves over 6,500 sonographers across Canada. Every three years, we ‘check the pulse’ of our profession so we can adjust our plans.

“Strategic planning is about evolution, not revolution,” stated Carolyn Trottier, CRGS, CRVS, Chair of Sonography Canada’s Board of Directors. “We adopt a gradual approach marked by deliberate and persistent action because change takes time. Our association must be nimble. We must have a plan, but we must also be ready to adjust the plan based on changes in the environment, the industry, the profession, and the feedback of our members. The last few years certainly allowed us to showcase our flexibility and adaptability.”



The strategic planning process allowed both the Board of Directors and the national office team to reflect on what its commitment to members could be and should be over the next three years. Collectively, the team came up with four (4) strategic pillars:



WORK to influence the health care system on behalf of sonographers. As health care changes in Canada, this strategy seeks to place Sonography Canada at decision-making tables, to respond to tangible member needs for better working conditions.



LEAD the continued progression of standards for diagnostic medical sonography to ensure the sustainability of the profession. As the demand for sonographers and their services continue to rise, this strategy seeks to uphold Sonography Canada's role in setting and maintaining standards for diagnostic medical sonography in Canada.



SUPPORT members to thrive through all stages of their professional practice. This strategy represents most of the services and benefits that members connect to the value of Sonography Canada and that have the potential to influence the practice of sonography significantly for the benefit of sonographers and patients.



BUILD upon Sonography Canada's organizational development to enable efficiency and growth. This strategy makes the rest of the plan possible by improving the employee, volunteer, and member experience and supporting connection and community across the organization.

For each of these strategies, the Sonography Canada team identified several actionable tactics — real projects and initiatives — that will translate into tangible and practical results. To read the full version of Sonography Canada's Strategic Plan for 2023-2025 and/or to access the infographic, visit the Sonography Canada website (www.sonographycanada.ca) and select 'Strategic Plan' from the 'About Us' drop down menu in the main navigation bar.

Step 3: Getting members excited about the Strategic Plan

That's right. We want you to get excited about this plan!

Our Strategic Plan is a 'contract' of sorts, outlining Sonography Canada's commitment to you and the scope of work it plans to deliver over the next three years in return for your membership dollars. It really is an interesting read!

And, we have gotten straight to the point. All you'll need is 5 - 10 minutes to read through Sonography Canada's plans for the next three years. Rather than draft a lengthy narrative explaining the planning process, its merits and importance, the document jumps right into the strategic pillars and what we plan to do.

And finally, its not just words on paper that are aspirational in nature and that, all too often, remain in the conceptual realm. While our plan does include some broad objectives, we have put a great deal of effort into including very practical actions we expect you to be able to see, hold us accountable to, and that you will benefit from.

Conclusion

As Executive Director of Sonography Canada, I am proud of the team I have built to help develop and, more importantly, deliver on our strategic plan. I want you to know and remember that this team is entirely focused on meeting member needs ... **your** needs.

Sonography Canada achieves its mandate through five core functions, each with a manager specifically assigned to ensure the implementation of their respective action items in the plan. These core functions are:

1. Certification (credentials) led by Jan Gilby, DMS;
2. Continuing Professional Development (CPD) led by Audrey McNeill;
3. Professional Practice led by Tara Chegwin, CRGS;
4. Membership/Marketing/Communications led by Meagan Rockett; and
5. Web development and Administration led by Riad Kadi.

Meeting the needs of over 6,500 members is ambitious. But this team is up to the challenge. As you consider the work being done by your association over the next few years, I hope you will agree with a message that has been made famous in a song by the Rolling Stones: "You can't always get what you want, but if you try sometime, you'll find you get what you need." That is our commitment to you.



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