Why is ASE Helping Lead Cardiovascular Point of Care Ultrasound Education?

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Rapid, safe, portable, and inexpensive, point of care ultrasound (POCUS) has changed the landscape of clinical practice. POCUS is indicated for the bedside assessment of a wide range of clinical scenarios: such as assessment of trauma in the emergency room (ER) to the imaging of a joint in the rheumatology clinic. Many of these subspecialties have established extensive protocols to ensure high quality training and image acquisition, whereas in some fields the application of POCUS continues to evolve.

The area of cardiovascular (CV) POCUS, especially for medical students and the novice user, is still emerging and is as of yet underdeveloped with respect to training guidelines and educational approaches. It is in the bridging of this educational gap that the American Society of Echocardiography can offer its greatest strength. The ASE’s premiere goal is to attract all users of CV ultrasound by creating quality and value.

How is the ASE Creating Quality and Value in CV POCUS?

In line with this strategic plan, the ASE has the opportunity to lead further development of CV POCUS using its rich network of cardiac ultrasound experts, educators, and bridge builders. ASE has undertaken several important initiatives in the last five years including an ever-growing series of ‘hands-on’ workshops teaching CV POCUS at the Annual Scientific Sessions (SS). This workshop, initially an initiative of the Vascular Steering Committee, was just an ‘add-on’ to the start of the SS, and now being tremendously popular is a ‘must-attend’ event. As the popularity and demand for the workshop grew, it was recognized that more didactic teaching of cardiac POCUS was also in demand and further sessions have been added to the SS tract led by POCUS experts from diverse backgrounds such as intensive care, emergency medicine, and anesthesia.

In 2017, recognizing that POCUS was becoming an emerging competency for medical students, Dr. Vera Rigolin charged the ASE POCUS Taskforce with creation of a CV POCUS curriculum for medical students. The result of this two-year endeavour has been the creation of ASE’s first dedicated product for teaching medical students the utility of CV POCUS in all years of training. The curriculum itself is based on collaborative research conducted with the Canadian Society of Echocardiography (CSE) defining how CV ultrasound is being used in medical school to: teach anatomy, understand physiology and hemodynamics, enhance physical exam teaching, and finally, integrate into assessment of pathology and clinical assessment.

What is the new ASE Cardiovascular Point-of-Care Imaging for the Medical Student and Novice User?

Modular: The ASE Curriculum attempts to reflect all aspects of how CV ultrasound is used as a tool to teach, diagnose, and guide treatment. It is modular in nature, recognizing that some schools already have extensive POCUS as part of their curriculum and so they may choose to select only the components they need, at the time they need it. However, the program is also complete and comprehensive for schools that are just beginning to consider starting POCUS teaching and offers basic instruction for educators, for example in the “Teach the Teachers” module.

Living: Thanks to the critical outreach efforts of Dr. Jonathan Linder, the ASE Cardiovascular Point-of-Care Imaging for the Medical Student and Novice User is a collaborative effort with the CSE and WINFOCUS. It is meant to be a ‘living curriculum’ where constant feedback and endorsement has been invited by other organizations including The Society of Ultrasound in Medicine (SUSME) and the American Institute of Ultrasound in Medicine (AIUM). The first version is freely available on the ASEUniversity, following its launch at the Canadian Cardiovascular Congress, October 2018. A further module is planned in the next iteration allowing for submission of cases by medical students, creation of a library of images, and peer-review of further CV POCUS research.

In Scope: An important consideration when developing the Curriculum was a consensus as to what defines a CV POCUS protocol, from beginning to end, at the medical student level. Following extensive discussion, the ASE POCUS Taskforce felt that assessment of jugular venous pressure and lung fields was a reasonable addition to the basic cardiac views, and was reflective of the practical utility of enhancing the physical examination of cardiovascular patients such as in the assessment of congestive heart failure. We also considered the value of adding vascular atherosclerotic assessment but at this time deferred its incorporation into the CV POCUS protocol. We describe an introductory CV POCUS protocol that was deemed achievable following evaluation of published accounts of CV POCUS teaching at various medical schools. It is recognized that this protocol may evolve. The Curriculum does not offer certification, but an educational supplement to CV POCUS training undertaken by a novice learner or medical student. This Program is careful in its differentiation between the terms ‘echocardiography’ (a formal diagnostic test) and ‘cardiovascular POCUS’ used in this context as a learning tool and to
enhance the physical examination. This program will support more advanced learning guidance being created by Dr. James Kirkpatrick as part of a second taskforce dedicated to subspecialty CV POCUS users (i.e. critical care echocardiography).

What are the Components?

Introductory Module
This Introductory Module outlines the modular curriculum suggested by the review of point of care ultrasound teaching strategies by various medical schools around the world entitled, “Cardiac Point-of-Care Ultrasound: State of the Art in Medical School Education” by Johri et al 2018.

Module A–Anatomy
Module A is an introduction to cardiac point of care ultrasound views as they correlate to basic anatomy. Module A presents the standard imaging views used in cardiac ultrasound, and relates them to both diagrammatic representation of cardiac anatomy and the cross-sections of preserved heart specimens that many medical school students are familiar with already. This Module identifies the important anatomical features and landmarks seen in each ultrasound view, and concludes with a brief review quiz of cardiac anatomy.

Module B–The CV POCUS Protocol
Module B takes the anatomy lessons learned in Module A, and focuses specifically on the complete cardiac POCUS scan. It outlines the views to be obtained during a POCUS examination, including vessels, heart, and lung. The POCUS scan is an abbreviated version of a full cardiac examination, and as such, it is important to capture the most representative views. In Module B, videos are introduced to demonstrate features that are only visible in motion.

Module C–The New Cardiac Physical Exam
Module C demonstrates the procedure of the cardiac POCUS exam, from the initial physical exam, to the positioning of the cardiac transducer for the acquisition of each POCUS view.

Module D–Pathology
Module D focuses on pathology through the presentation of clinical cases. For each case, the specific POCUS view or views used to image the pathology in question are identified, and anatomical features that assist in diagnosis are highlighted. Module D concludes with a self-guided review question section for learners to test their understanding of how POCUS can assist with diagnosis.

Module E–Teach the Teachers
Module E, Teach the Teacher, focuses on what should be taught to enable someone to adequately perform POCUS, and how this information should be presented.

Module F–Testing
Finally, Module F is a testing module designed for quality control and to assess knowledge gained.

The entire curriculum is freely available online at: ASEUniversity.org/ASE/Conferences/266/View

The Curriculum may serve as an important starting point for medical school teaching of CV POCUS, not only as a tool to teach but to also enhance skills. We welcome feedback and input to further enhance this collaborative endeavour.
About the Authors

Salwa Nihal, MSc is an experienced Educational Program Designer and has produced multiple online university level courses for Queen’s University. She coordinates the CV POCUS Workshop for Queen’s University School of Medicine. She created the original pathologic specimens with anatomic correlation used for the ASE CV POCUS Curriculum and is responsible for the overall design and ‘look’ of the Curriculum modules.

Julia Herr, MSc is a program coordinator of the Cardiovascular Imaging Network at Queen’s University (CINQLab.com) and is a highly accomplished medical illustrator. She created the original artwork for the ASE CV POCUS Curriculum and was responsible for overall organization of the design process.

Amer M. Johri, MD, FRCP, FASE is the ASE POCUS Task Force Chair. He led a dynamic group of ASE members contributing to the content creation of the CV POCUS Curriculum (see module for acknowledgements).

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