

There are no shortcuts: A focus on POCUS

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Paramedics deliver a 72-year-old male patient with acute shortness of breath to your emergency department (ED). He has already received two rounds of nebulized salbutamol. He is too breathless to provide any history, but a quick review of his medications reveals salbutamol and fluticasone inhalers, enalapril, and acetylsalicylic acid (ASA). He is sitting upright with yellowed fingers from cigarette smoking. He is afebrile with a heart rate of 112 beats per minute, blood pressure of 172/92, respiratory rate of 32, and an oxygen saturation of 94% on a 100% rebreather. He has two-word dyspnea, with wheezes and crackles heard throughout his chest. In addition, you note that he has some mild bilateral leg swelling. Can lung point-of-care ultrasound (POCUS) help?

Acute shortness of breath is a common presentation among ED patients and can be challenging to diagnose. Differentiating between acute heart failure and chronic obstructive pulmonary disease (COPD) poses particular difficulty, with similar signs and symptoms found in both. There is no gold standard test for heart failure, and a diagnosis requires the incorporation of a clinical history, physical examination, and initial investigations such as chest radiographs, electrocardiograms, and lab work. Biomarkers such as natriuretic peptides have also been suggested, as have comprehensive echocardiograms, to assess function and anatomy.^{1,2} As a result, we continue to search for a test that will further help us differentiate between these common clinical entities.

In this issue of *CJEM*, McGivery et al. present the evidence for the use of lung POCUS for the diagnosis of acute heart failure.³ This systematic review and meta-analysis add to the body of literature surrounding the role of lung POCUS, focusing specifically on the ED, and the diagnosis of acute heart failure by the detection of sonographic B-lines. These results strongly

support the utility of lung POCUS in the diagnosis of acute heart failure, despite the test characteristics not being as robust as previously reported in other settings.^{4,5} Yet, even though lung POCUS still performs much better for the diagnosis of heart failure than chest radiographs, or natriuretic peptides, it still has not been adopted routinely by emergency physicians and is not included in standard clinical guidelines.

Why is lung POCUS underused? Perhaps it is because lung POCUS is a novel application of ultrasonography, outside of the traditional comprehensive ultrasound imaging domains of radiology, cardiology, and obstetrics and gynecology.

In fact, even in our own discipline of emergency medicine, there continues to be a debate about the acceptance of POCUS as a required competency for all emergency physicians, also highlighted in this issue of *CJEM*.⁶ There is mounting evidence that emergency physician performed POCUS is as good as, or nearly as good as, comprehensive imaging for traditional indications such as suspected nephrolithiasis.⁷ Perhaps there continues to be a debate around POCUS as a core clinical competency because very few centres routinely archive POCUS images so that all healthcare professionals can see the images.

Or perhaps POCUS continues to be misunderstood, and the literature supporting its use could be propagating this misunderstanding. By definition, POCUS is goal-directed, problem-oriented, and limited in scope. It is time sensitive, repeatable, and performed by the treating clinician at the point of care. Prior to picking up the probe, the clinician has already narrowed the differential diagnosis based solely on the available clinical information. POCUS can then be performed and integrated within the entire clinical context. This enhances the decision-making process in determining a

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diagnosis or recognizing the need for comprehensive imaging.

Yet many of the studies continue to compare POCUS with the gold standard of comprehensive diagnostic imaging such as radiology performed ultrasonography or computed tomography independent of the clinical information garnered by the clinician. It is these comparisons that can misrepresent POCUS, in that it is being studied in ways that it was never intended to be used. POCUS is not comprehensive imaging.

Perhaps we will see POCUS used more as part of structured clinical decision rules, just as the D-dimer test has been incorporated into Wells' criteria for the diagnosis of venous thromboembolism.⁸ Further studies examining the use of POCUS within the clinical context will be more useful, and we have already begun to see the incorporation of POCUS as part of Wells' criteria for pulmonary embolism, replacing "clinical signs and symptoms of DVT" (deep vein thrombosis) with "venous ultrasound positive for DVT."⁹

There is no doubt that we must continue to research the impact of POCUS. However, we should move away from comparing it with comprehensive imaging and focus on POCUS being studied in the manner for which it was intended and looking at its impact on patient-oriented outcomes. The McGivery study is an important step in that direction and further emphasizes the need for a complete clinical assessment, given that there is no gold standard for the diagnosis of congestive heart failure (CHF). There are no shortcuts to clinical diagnosis. We are clinicians first. POCUS is one of our clinical tools.

Your patient remains breathless. There has been a limited response to the nebulized salbutamol, and there continues to be diagnostic uncertainty between a COPD exacerbation and acute CHF as a cause of the patient's shortness of breath. For more information, you decide to perform lung POCUS that reveals widespread sonographic B-lines bilaterally, with small pleural effusions. This added information gives you further confidence in initiating acute CHF management, and you note clinical improvement over the next 15 minutes. The X-ray technician now arrives to perform the chest radiograph.

There is a saying, "Never be the first and never be the last." You certainly do not need to worry about being the first to use POCUS, but we hope that you will not be the last.

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