


Lung point-of-care ultrasound, an opportunity to improve patient care and patient-oriented outcomes

David Barbic , MD, MSc^{*}; Tom Jelic , MD[†]; Jordan Chenkin, MD, MEd[‡]; Claire Heslop, MD, PhD[§]; Paul Atkinson , MB BCh BAO, MA[¶]

Point-of-care ultrasound (POCUS) has a substantial evidence base demonstrating high levels of diagnostic accuracy and reliability in emergency medicine (EM).^{1,2} POCUS can accurately diagnose acute congestive heart failure in emergency department (ED) patients.^{3,4} However, one of the major limitations of EM POCUS research has been a lack of studies into the impact of POCUS on patient-oriented outcomes. In this issue, Nakao et al.⁵ report a novel study exploring the impact of POCUS on patients with acute heart failure or chronic obstructive pulmonary disease (COPD) exacerbations in the ED. The authors should be commended for their rigorous study methods and focus on patient-oriented outcomes such as ED length of stay, time to disposition, time to disease-specific treatment, and adverse events. There are important limitations to this study, including a very low rate of lung POCUS use (2.3% of eligible patients) and a high proportion of undiagnosed patients in those not receiving lung POCUS and excluded for other diagnoses (26%). In addition, the authors were also unable to incorporate the treatment provided by paramedics for those arriving to the ED by ambulance (53%). Other important limitations to note include the relatively stable triage vital signs of included patients, and that one-third of the lung POCUS group received “disease-specific treatment” prior to the conduct of lung POCUS. These limitations may alter the main findings by Nakao et al.,⁵ but the direction or magnitude of this change is uncertain.

Despite these important limitations, the study by Nakao et al.⁵ warrants attention from emergency clinicians and researchers. Although the authors were unable to demonstrate a significant difference in their primary outcome, ED length of stay, the time to initiation of disease-specific treatment was significantly improved in those receiving lung POCUS performed by emergency physicians. This finding is significant, as increased diagnostic certainty early in a patient’s ED visit, as well as focused, disease-specific therapy, may improve patient outcomes in those patients presenting with acute heart failure and COPD. The work by Nakao et al.⁵ is consistent with prior evidence demonstrating increased diagnostic certainty and accuracy on the part of emergency physicians integrating lung POCUS into their assessment of undifferentiated patients,^{4,6} yet without significant changes in ED length of stay, admissions, or mortality.⁷ ED POCUS does contribute to decreased length of stay for patients with other presenting complaints.^{8,9} These differences may be related to the relatively small sample size of the study by Nakao et al.⁵ or to the nature of exacerbations of acute heart failure and COPD, with a substantial proportion of these patients requiring prolonged ED stays for stabilization or admission to a hospital. Future research is warranted to determine whether lung POCUS improves ED length of stay for these patient populations.

The utility of lung POCUS has been recognized by clinicians in EM and critical care for over 20 years.¹⁰ Despite being a relatively easy-to-learn core POCUS

From the ^{*}Department of Emergency Medicine, Centre for Health Evaluation Outcomes Sciences, University of British Columbia, St. Paul’s Hospital, Vancouver, BC; [†]Department of Emergency Medicine, University of Manitoba, Winnipeg, MB; [‡]Division of Emergency Medicine, University of Toronto; Sunnybrook Health Sciences Centre, Toronto, ON; [§]Division of Emergency Medicine, University of Toronto; University Health Network, Toronto, ON; and the [¶]Department of Emergency Medicine, Dalhousie University, Saint John Regional Hospital, Saint John, NB.

Correspondence to: Dr. David Barbic, Emergency Department, St Paul’s Hospital, 1081 Burrard St, Vancouver, BC, V6Z 1Y6; Email: David.barbic@ubc.ca

modality for EM¹¹ and acknowledging that much of the evidence supporting the use of lung POCUS in undifferentiated breathlessness is recent, it is regrettable that the current guidelines for diagnosis and management of acute heart failure from the Canadian Cardiovascular Society (CCS) omit lung POCUS from the diagnostic algorithm.¹² The opportunity thus exists to work collaboratively with leaders in cardiology to incorporate the most up to date and relevant evidence into the next iteration of the CCS heart failure guidelines to improve the care of patients presenting to the ED with undifferentiated, acute dyspnea.

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