

Bedside Ultrasonography Guidelines for Critically Ill Patients



In June 2016, *Critical Care Medicine* published Part II of guidelines for the appropriate use of bedside general and cardiac ultrasonography in the evaluation of critically ill patients. Part I of the guidelines focused on general ultrasonography while Part II focused on the indications for cardiac ultrasonography and echocardiography.^{1,2} The guidelines provide evidencebased recommendations for the appropriate use of bedside ultrasonography in the intensive care unit. Their goal is to help critical care practitioners use this technology appropriately to improve patient outcomes by focusing on answering clinically relevant and time-sensitive questions.

Bedside cardiac ultrasound is an established technique used to evaluate cardiac function. While not specifically addressed by these guidelines, the adoption of the guidelines raises questions moving forward for intensive care practitioners and healthcare systems about the need for certification and credentialing of physicians for the use of bedside ultrasonography. The Society of Critical Care Medicine (SCCM) previously published a document providing recommendation for achieving and maintaining competence in critical care ultrasonography.³ Current trainees will be able to achieve competence longitudinally across their training. A number of medical schools have begun to incorporate ultrasound training into their curricula.⁴ Training in the use of ultrasonography can then continue during residency and fellowship. For current providers in practice who have not received formal ultrasound training, SCCM and other specialty societies offer training programs.

Another potential question surrounding the publication and implementation of these guidelines is whether the use of cardiac ultrasonography performed by the critical care practitioner at the bedside should replace formal echocardiographic assessment by a cardiologist. These guidelines recommend that bedside ultrasound assessment be used as an extension of the intensivist's physical examination.² The advantage of the practitioner's bedside ultrasound examination is that it can be repeated over time to allow the practitioner to assess the patient's response to therapy and changes in clinical course. Additionally, the bedside ultrasound examination can be performed with specific clinical questions in mind with the goal of obtaining real-time information relevant to care of the critically ill patient. For more complex cardiac issues, a formal echocardiographic assessment may be indicated.

The guidelines provide a separate framework of recommendations for practitioners with basic versus expert levels of expertise in utilizing ultrasound. While the recommendations focus on both basic and expert levels, the authors acknowledge that practitioners have varying levels of expertise and training within the spectrum of basic to expert that may be difficult to define.² Bedside providers should perform only elements of the examination for which they have demonstrated competence in image acquisition and interpretation. This is perhaps most important regarding recommendations for the use of transesophageal echocardiography (TEE). TEE receives several recommendations for use by advanced practitioners who have been specifically trained in its use. However, it is likely that, as technology evolves with such advances as minimally invasive TEE and automated cardiac output, practitioners with lower levels of expertise may be able to competently analyze new parameters and utilize this modality.

These new guidelines represent evidenced-based recommendations for the use of bedside ultrasonography. It is believed that the field of critical care ultrasound will undergo transformation due to increased training and adoption of bedside ultrasonography across many fields. As ultrasound technology advances, critical care practitioners will increasingly utilize bedside cardiac ultrasound as part of routine patient assessments to enhance the care of critically ill patients.

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2. Levitov, A, Frankel, HL, Blaivas, M, et al. Guidelines for the appropriate use of bedside general and cardiac ultrasonography in the evaluation of critically ill patients—Part II: cardiac ultrasonography. *Crit Care Med*. 2016 Jun;44(6):1206-1227.
3. Pustavoitau A, Blaivas M, Brown SM, et al; Ultrasound Certification Task Force on behalf of the Society of Critical Care Medicine. Official Statement of the Society of Critical Care Medicine: Recommendations for achieving and maintaining competence and credentialing in critical care ultrasound with focused cardiac ultrasound and advanced critical care echocardiography. Mount Prospect, IL: Society of Critical Care Medicine. <http://journals.lww.com/ccmjournal/Documents/Critical%20Care%20Ultrasound.pdf>. Accessed February 13, 2017.
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