

## Letter to the Editor

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To the Editor,

We read the article by Dr. Sperandeo and colleagues [1] with great interest. A highlight of the article is the detailed focus on equipment settings and technique, and explanations for the physical origins of artifacts. The description of normal and pathological findings, and various features that may be observed to distinguish disease processes, was an excellent summary. Overall, this was a thoughtful approach to the emerging uses of ultrasound for thoracic disease.

This article also stresses the use of ultrasound as an important auxiliary technology for chest diagnosis, as well as the limitations of ultrasound in the chest. Thoracic imaging relies primarily on computed tomography or chest radiography, and ultrasound, as described, is used primarily to monitor known lesions or guide intervention. While it may be possible to distinguish pulmonary parenchymal disease such as tumor versus pneumonia with ultrasound, further evaluation is indicated to make a definitive diagnosis.

There are issues involved in applying ultrasound technology in routine clinical practice (point-of-care ultrasound). The current literature is replete with articles advocating ultrasound at the bedside to evaluate congestive failure and even to differentiate it from chronic obstructive pulmonary disease. This is puzzling, as these conditions may be present alone or in combination with one another. The prevalence of articles in the medical literature endorsing the validity of counting artifacts to make a diagnosis of pulmonary edema (extravascular lung water) is particularly troubling. These articles are not based on high-quality

evidence, and are of questionable validity if applied in the care of patients.

While it is very appealing to be able to make a diagnosis quickly, cheaply, and without radiation, it is much more important to have an accurate diagnosis, made with properly maintained equipment by someone who is aware of how best to use the equipment, interpretive pitfalls, technical look-alikes, false positives and false negatives.

It is understandable that clinicians would like a widely available tool that is free of radiation and that would help to guide their management of disease processes. There is a tremendous amount of pressure in the field of medicine to be productive, and to be perceived as knowledgeable by one's peers. With the miniaturization, reduced cost, and widespread availability of ultrasound equipment, there is a lot of interest in applying this technology at the point of care. With the publication of multiple articles advocating the use of point-of-care ultrasound in a variety of areas, each specialty exerts pressure on its practitioners and trainees to provide this technology. Very little attention is paid to the nuts and bolts of acquiring high-quality images or to understanding the physics involved in generating these images and artifacts; there is very little high-quality data in the pulmonary, cardiac or emergency medicine literature with prospective blinded studies comparing point-of-care ultrasound to gold standard imaging tests or good clinical follow-up.

In addition, before applying this technology in clinical practice, it is necessary to take care to ensure that all practitioners are well trained and supervised while they are early in their experience. Passing the technique on from practitioner to practitioner in an uncontrolled manner, while simultaneously taking care of sick patients in a high-pressure environment (the Emergency Department or the Intensive Care Unit) is a recipe for bad clinical outcomes.

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In medicine today, there is so much pressure to be “efficient” that clinicians often behave as though the history and physical examination are less productive than an imaging study. As radiologists, we are often consulted to review a radiograph or ultrasound with a clinician who has not yet met or examined the patient. While the clue to a diagnosis may be available on a radiographic or ultrasound study, the findings are often non-specific, and the clinical information is critical to making an accurate diagnosis. There is so much more to making a diagnosis than looking at an imaging study. We fear that expecting a clinician to become

adept at performance and interpretation of ultrasound examinations, in addition to admitting and taking care of a patient, will ultimately degrade the quality of medical care.

## Reference

1. Sperandeo M, Rotondo A, Guglielmi G et al (2014) Transthoracic ultrasound assessment of pleural and pulmonary diseases: use and limitations. *Radiol med*. doi:[10.1007/s11547-014-0385-0](https://doi.org/10.1007/s11547-014-0385-0)