

## Point-of-Care Ultrasound: Not A Stethoscope—A Separate Clinical Entity

**To the Editor:** One of us recently asked a medical student what he liked most about learning ultrasound during his educational experience. He replied, “When I graduate, I might not need to carry a stethoscope anymore. Ultrasound gives me all the information I need when examining my patient.” A review of the literature and editorials over the last several years suggests that this is not a novel perception. In 2003, Lennard Greenbaum, MD, wrote an article in the *Journal of Ultrasound in Medicine* entitled “It Is Time for the Sonoscope.”<sup>1</sup> In it he described the sonoscope as a tool that should be used by the clinician to enhance the physical examination but emphasized that no images should be recorded and no charges be generated, as that is consistent with clinician use of a stethoscope, ophthalmoscope, or otoscope. He expanded that if an abnormality is revealed, the patient should be sent to an accredited ultrasound facility where published ultrasound standards are enforced. He stated, “If sonoscopes are considered sonographic imaging devices, and if charges are generated by their use, it could be disastrous for all currently involved with true sonographic imaging: users, patients, and even equipment manufacturers.”

In 2012, Eric Topol, MD, a cardiologist well known for his mission to digitalize medicine, stated, “I haven’t used my stethoscope in 2 years; it is a worthless tool that I should just throw out.”<sup>2</sup> Dr Topol described a scenario in which he evaluated a patient’s heart function with a GE (Milwaukee, WI) V-scan device the size of a flip phone. Dr Topol was able to quickly determine that there was no global wall motion abnormality and furthermore stated that although most physicians would charge \$600 for this examination using an expensive ultrasound system, he charged nothing, as it was a routine part of his physical examination. Topol stated, “There are 125 million ultrasound studies performed in the United States each year, and probably 80% of these could be done with the V-scan at no additional charge.”

In 2011, Christopher Moore, MD, and Joshua Copel, MD, published an article in the *New England Journal of Medicine* entitled “Point-of-Care Ultrasonography,” in which they defined point-of-care sonography as performed and interpreted by the clinician at the bedside.<sup>3</sup> Furthermore, they discussed the 2004 conference on compact ultrasound hosted by the American Institute of Ultrasound in Medicine (AIUM), which concluded that the concept of the “ultrasound stethoscope” is quickly moving from theoretical to reality.

The movement to integrate ultrasound into the medical school curriculum has been gaining momentum over the last several years and for good reason. Ultrasound provides a dynamic window into the human body, enabling students to dramatically enhance their knowledge of functional anatomy and physiology. It enhances patient evaluations and examinations across organ systems. Organizations such as the Society of Ultrasound in Medical Education promote the use of ultrasound in medical education through development of educational experiences, research in outcomes, and distribution of results. The AIUM hosts a multispecialty interest group dedicated to helping members integrate ultrasound into medical student and resident education. The phrase “extension of the physical examination” and other like references to replacing the stethoscope continue to be propagated.

There is no question medical students are excited about integrating ultrasound into their education. However, we are concerned that the perception of this tool as a stethoscope applied in real-life clinical scenarios has the potential to be destructive to the field and detrimental to patient care. In 1988, Roy Filly, MD, wrote an editorial entitled “Ultrasound: the Stethoscope of the Future, Alas.” He lamented that the rest of the world (even 26 years ago) considered ultrasound the stethoscope of the future but pointed out the general unwillingness to integrate the technology into medicine. He also pointed to the importance of appropriate training for both performance and interpretation in using diagnostic imaging technologies.<sup>4</sup>

Twenty-six years after Dr Filly wrote that prophetic statement, medicine is faced with a different dilemma. Where are the appropriate places for the physical examination and ultrasound in the clinical evaluation of the patient? If we are talking about the extension or augmentation of the physical examination of a cadaver or healthy volunteer to augment the educational process, it seems logical to liken ultrasound to a stethoscope. In this setting, decisions regarding patient care are not being made, and no quality assurance process needs to be in place. In clinical practice, nontraditional users are using ultrasound across multiple specialties to make critical, time-sensitive patient care decisions on a daily basis. These scans are diagnostic and should be archived, documented, and billed. As the government moves toward holding hospitals accountable for proving meaningful use of technology, it is paramount that those of us using this technology under the hospital roof do so in a responsible fashion that ensures quality and patient safety.

Other considerations are that sonography requires specified equipment, including an ultrasound system,

transducers, and gel. It requires knowledge of sonographic windows, ultrasound physics, and hand-eye coordination for manipulation of the probe. The technical aspect of image acquisition is critical. In addition, clinical ultrasound requires interpretation of sonographic data that are often independent of physical examination findings. A series of artifacts based in physics will be encountered that are integral to performance and interpretation. Finally, ultrasound must be integrated into the clinical evaluation with its own test characteristics separate from the physical examination.

In the end, both the physical examination and the clinical ultrasound examination deserve their place in the evaluation of the patient. One does not replace another, and both have their own supporting science and literature. Ultrasound is an asset to any medical student curriculum, but this integration is very different from its use in the clinical arena. Clinicians would be served by avoiding the label “ultrasound is an extension of the physical examination” or “the stethoscope of the future.”

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