Use of Ultrasound in US and Canadian medical schools

Medical school instruction in diagnostic ultrasound is becoming increasingly common, yet substantial variability remains in the quantity, delivery methods, and depth of ultrasound education provided. A distinction exists between many schools that have taken a small step to incorporate any ultrasound content into their curricula, and those with a more extensive ultrasound focus. The latter schools have created programs geared toward creating a new generation of clinicians for whom an ultrasound probe is as readily-accessible and useful as their stethoscopes.

Recent data show ultrasound teaching being incorporated widely, although not universally, across American and Canadian medical schools. A 2012 survey of 134 medical schools in United States found 51 responding as having implemented ultrasound into their UME curriculum. The presence of ultrasound content by school-year was fairly evenly divided, with a slight preponderance in the 3rd year.1 Two years later, a survey of 173 allopathic and osteopathic schools in the United States found 48 schools reporting a formal ultrasound curriculum. This 2014 survey found that ultrasound teaching had been implemented more in the first two years of medical school.2 A Canadian study also conducted in 2014 found six of 13 responding medical schools having implemented bedside ultrasound education in their undergraduate curricula.3 The AAMC Curriculum Inventory data for Academic Year 2015-16 reveals ultrasound education content in 101 medical schools, (click on Figure for details) with the majority of schools offering relevant content in the first two academic levels.
While many schools have incorporated ultrasound content into their curricula, for the majority of these schools such experience is limited. As documented in the related Curriculum Inventory content report, the median number of ultrasound teaching events per school is seven, occurring in a median of four courses / clerkships. The maximum number of ultrasound teaching events reported is 42, and the maximum number of courses / clerkships with ultrasound content is 18, presumably representing schools with an explicit focus on ultrasound. A few schools have fully integrated four-year ultrasound curricula, such as the University of South Carolina (starting in 2006, the first school to do so) and the University of California, Irvine (starting in 2010).4

Ultrasound teaching in UME has been incorporated within various courses. In the pre-clerkship curriculum, one of the more logical places to include ultrasound, especially at schools intending to develop their students' bedside diagnostic skills, is within their Physical Diagnosis courses. Ultrasound teaching can also be logically included within Anatomy and Physiology courses, where the technology is particularly well-suited in demonstrating cardiovascular reflexes. Ultrasound teaching during the clinical phase of UME has been offered in multiple areas, including third-year intersessions, fourth-year pre-internship capstone courses, and in Emergency Medicine clerkships.

Since the acquisition of bedside diagnostic ultrasound skills requires hands-on training and practice, clear limitations related to resource availability exist. To implement effective clinical ultrasound training, a school needs to address:

- Carving out time in the overall curriculum, often already at a premium
- Sufficient number of ultrasound machines to allow adequate hands-on practice
- Faculty (and/or other facilitator) time commitment
- Faculty ultrasound expert to champion the effort
- Financial burden of all of the above items

A solution to the problem of limited availability of ultrasound teaching faculty utilized by several schools is the adoption of near-peer mentoring. More advanced medical students (often fourth-year students) can effectively serve as practical instructors for their more junior classmates. The near-peer instructors can receive additional specific training, further refine their own skills and teaching abilities, and may be participating in an ultrasound elective for academic credit.

Given the relative novelty of teaching ultrasound in UME, it is not surprising that no national guidelines or standards for curricular content yet exist. In response to this absence, a panel of 34 directors of ultrasound in medical education recently constructed a list of 90 core clinical milestones in bedside ultrasound that may serve as a guide in constructing a medical school ultrasound curriculum.5
Author:
Jeffrey R. Suchard, MD, FACEP, FACMT is Professor of Clinical Emergency Medicine and Pharmacology at the University of California, Irvine Health School of Medicine. Dr. Suchard is the course director for Medical Pharmacology and also serves as the Associate Dean for Basic Science Education.

References