

This content is from the the following website:

<http://www.acep.org/practres.aspx?id=30512&fid=2206&Mo=Yes>

How to Set Up an Ultrasound Presence in your ED

By Erik Ness

John Kendall, MD, remembers the patient that sold him on the ultimate value of emergency ultrasound. Dr. Kendall, past chair of the ACEP Emergency Ultrasound Section, had little to go on except that the man had just passed out. He pulled out a probe and started scanning around the heart. When he got to the abdominal aorta he discovered a huge aortic aneurysm. "It was this light bulb that went off," he recalls. No studies to order, no waiting on other departments. Just lift the phone and call the surgeon: "I have a high level of suspicion that this patient has a surgical emergency."

Emergency ultrasound-defined as the use of ultrasound by credentialed emergency physicians in appropriate clinical settings for integration into the patient's care without further testing or verification-is changing the standard of care for emergency medicine. Roughly a third of emergency departments now have ultrasound capability, and most emergency medicine residents are now trained in its use. More to the point, they expect it, and are starting to make decisions on where they want to work based on ultrasound availability. Dr. Kendall said two of his residents this year turned down appealing jobs in places they wanted to go because the EDs did not have ultrasound. "They felt like they wouldn't be practicing to a standard that they had become accustomed to," he said.

Implementing emergency ultrasound is not a trivial process. Starting a program in your ED requires successfully navigating three areas of concern: Cultural, technological, and political. This last-securing the credentialing and privileging rights necessary to use ultrasound in your hospital-can be controversial, and is covered in the second part of this series.

The first and most important obstacle is cultural. "The physicians and the physician group need to want to do this," said Vivek Tayal, MD, ultrasound director at Carolinas Medical Center in Charlotte, and past chair of the ACEP Emergency Ultrasound Section. Between turf battles, learning curves, and protocol development, there is plenty of work to do. But the cultural acceptance that ultrasound is part of emergency medicine practice is probably the most important. It will start-and then keep-the ball rolling. "Once they get into it," he said, "the political and technical will follow."

Ultrasound veterans like Drs. Tayal and Kendall say leadership is key: A local champion to make it happen and an ultrasound director once you're operational. The director is the point person for anything ultrasound, and oversees the development and implementation of emergency ultrasound protocols. They are ultimately responsible for training personnel and organizing the machine infrastructure. A good director provides the quality assurance and oversight that are foundations

for developing an ultrasound program that's in tune with emerging applications. Depending on how large the ED is, and how many ultrasounds they perform, the ultrasound director may be a part or full time position. At the 10-per-day threshold, you can expect to need a full-time director, or to add a second member to assist with quality assessment. If you have the luxury of hiring an ultrasound director look for fellowship training in emergency ultrasound or strong residency experience.

Once the decision has been made to pursue ultrasound and leadership is established, assess who has training and who doesn't, and what it's going to take to get the group up to ACEP standards. This will immediately plunge you into the chicken-and-egg challenge of emergency ultrasound: what comes first, the education or the machine?

Ideally you want both to happen at the same time. Obviously, education is needed to use the machine properly. Because performing the studies is a blend of hand-eye coordination and real-time interpretation, it's really critical to have a machine available for practice studies to follow up any education and consolidate new skills. If you don't, warned Dr. Tayal, "they will lose their skills. Our physicians need to get enough scans under their belt to be comfortable with the application."

If enough of the group needs education, a few companies offer in-house training programs. ACEP guidelines suggest a 2-day comprehensive course covering all primary applications over 16 hours as a foundation for emergency ultrasound; an 8-hour course can cover a few applications. Subsequent training can take many forms, but quality assessment and quality improvement oversight by the ultrasound director should play a significant role in both the initiation and continuing development of a good ultrasound program. Getting everybody trained is a real barrier to the advance of emergency ultrasound, emphasized Dr. Kendall. "How do we get these thousands of emergency physicians actually up and doing it?"

The technology is certainly ready. With the proliferation of new technology, choosing a machine is probably both easier AND harder than it was 10 years ago. To begin with, be wary of donated older equipment. It may work perfectly well, but it may not be appropriate for an ED setting. If it's slow to boot up or too big to go into half of your rooms, it's not the right machine. Choose a machine that fits both the practice of your department and future ultrasound applications.

(Review the ACEP [Emergency Ultrasound Section's Criteria for choosing ultrasound equipment.](#))

According to Dr. Tayal, you want to pay particular attention to the quality of the 2-D image, and you want to test it on a patient that weighs at least 250 pounds. Small machines are better than large, but look for multiple probe ports. Laptop-based units are increasingly common, but check boot times and be certain the machine is dedicated and heavily shielded from network threats such as viruses. Some machines designed for lab use may not work so well in the chaos of the ED. Ease of use, image storage, durability, and connectivity are all important considerations.

Machines can be had for less than \$25,000 and more than \$100,000. Whatever the price, be sure that it includes training, a thermal printer, the necessary software, multiple probe ports, and two to three probes. Dr. Tayal recommends a small, tightly curved curvilinear for abdominal,

transabdominal pelvic, and cardiac; a linear probe for procedural guidance and soft-tissue work; an endovaginal probe for pelvic, and a phased array probe.

Dr. Tayal warns against underestimating the maintenance end of ultrasound management. It won't surprise you that the ED is hard on machines-typically they last from three to five years. Because the machine is constantly moving, supplies and documentation need to be on-board. "Set expectations high regarding treatment and cleaning of the machine," he advised. Maintenance contracts are often available from the machine vendor.

Reimbursement considerations are relatively straightforward. Purchasing an ultrasound machine is not considered a Stark II violation, as the Centers for Medicare and Medicaid Services has ruled that diagnostic health services personally performed or provided by the referring physician are not official referrals. For reimbursement, you need to document the medical necessity of the ultrasound, describe the technique and supplies used, and provide an interpretation. Templates to document ultrasound procedures are highly recommended for dictation and for any paper or computer forms. If images are to be digitally stored, a universal coding system is a requisite to keep order. Radiology departments generally have good image archiving systems, but there may be cost and political considerations.

"If you do emergency procedures, you should have ultrasound available," said Dr. Tayal. "You really need to get on board this application soon. Ultrasound, just like any other skill, builds on itself. It is imperative that EDs that have not in the past considered ultrasound necessary start looking at it as part of their emergency care, now. It's not just about diagnosis. The most recent thrust nationally has been procedural guidance, and the future is therapeutics."