Emergency Medicine in the Community Hospital

How Ultrasound Tools Enable Greater Diagnostic Accuracy and Productivity

A discussion with:
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The young man was back in his local emergency department five days after a laparoscopic cholecystectomy. He was tachycardic, pale, and complaining of pain in his right upper abdomen. Dr. Blankenship performed a FAST exam with a hand-carried ultrasound system but could not find any fluid or bleeding in the abdomen. As part of the FAST protocol, a focused cardiac exam was performed which quickly revealed pericardial effusion and early tamponade. Within 10 minutes of arrival to the ED, Dr. Blankenship had a definitive diagnosis of post-operative pericarditis, and the cardiology department was preparing to drain the patient's tamponade.

Patients like this one walk into community hospital emergency departments every day. They may be hypotensive with vague abdominal pain, or have no pain at all. At that point, the sheer number of possible scenarios typically triggers a battery of radiology and laboratory testing that can take hours to reach a diagnosis.

But emergency physicians can reach a definitive diagnosis faster with bedside ultrasound. Published evidence supports this.[1, 2, 3, 4]

Robert Blankenship, MD, FACEP knows first-hand how broadly applicable hand-carried ultrasound is to emergency medicine. He used SonoSite hand-carried ultrasound systems while deployed in Iraq with the 1-66 Armored Regiment, 4th Infantry Division, and later in the emergency department at Madigan Army Medical Center in Tacoma, Washington, a Tier 2 Trauma Center.

He now practices emergency medicine at St. Vincent's Hospital in Indianapolis, a community hospital. And while the St. Vincent's ED does not often receive patients with gunshot wounds and heavy blunt trauma, Dr. Blankenship is an evangelist for the value of emergency ultrasound in his current clinical practice.

The fact is that ultrasound can help the emergency physician reach a fast and accurate diagnosis in the much more common situations where the patient's condition is not immediately apparent.

Ultrasound in the Community ED

"Ultrasound has traditionally been promoted to emergency physicians as a tool for assessing trauma, and it is an awesome tool for trauma," said Dr. Blankenship. "But many community hospitals do not see a large volume of trauma, so the emergency physician asks, why do I need ultrasound? The fact is that ultrasound can help the emergency physician reach a fast and accurate diagnosis in the much more common situations where the patient's condition is not immediately apparent. And emergency physicians can be trained to do this."

- An elderly, hypotensive man presented with tenderness in his right lower abdomen. Though the patient had not suffered any trauma, Dr. Blankenship performed a FAST and aorta exam with a hand-carried ultrasound system. The patient had a ruptured aortic aneurysm, and was sent to surgery within minutes of the start of the exam.
- Dr. Blankenship used ultrasound to measure central venous pressure on another hypotensive patient, and immediately scanned her abdominal aorta. It was intact. Though 12-months prior this patient had a normal echocardiogram, a scan of the heart found markedly decreased ejection fraction and global hypokinesis from a heart attack.
- In a less urgent case, Dr. Blankenship examined red, swollen skin on a woman's face. She had a severely compromised immune system and was taking a blood thinning medication. One month prior she had a similar-looking abscess cut and drained. Dr. Blankenship did not want to cut the skin if the patient did not have an abscess, and probing the skin to detect an abscess with a needle can be inaccurate. But an ultrasound scan found no infection, saving the patient from a risky, unnecessary procedure, given her condition, as well as from a possible complication.

Enhancing Care and Saving Time

"Eighty percent of the time you use ultrasound in the ED for a patient with a symptomatic first-trimester pregnancy, you diagnose an intra-uterine pregnancy," Dr. Blankenship said. "If you have to send the patient to radiology for this examination, it can take up to three hours for that patient to receive her diagnosis. With ultrasound in the ED, in 60 to 80 percent of cases you can send a women home in 30 to 60 minutes with an appropriate diagnosis. So in addition to providing that patient with the proper disposition regarding her pregnancy, you have saved your hospital two to three hours of productivity."

These productivity gains add up. "So if an emergency physician sees 10 women with pregnancy issues in a day, his hand-carried ultrasound can save 20 hours of hospital productivity, and get the patient safely dispositioned in less time."

Why SonoSite?

Dr. Blankenship used SonoSite's 180PLUS™ hand-carried ultrasound systems in a deployed setting with his armored unit. With ultrasound imaging, he localized and removed foreign objects, identified pneumothorax, and examined fractures and other traumatic injuries, often under very stressful conditions.

"The devices are super reliable, and super durable," he said. "The 180 has a pop-up screen, and I have seen a few devices that were really banged up, with the screens ripped right off. But they kept working great. We'd just hook them up to a TV, and we could see just what we needed to see."

At Madigan, the emergency department was equipped with SonoSite's MicroMaxx® systems, and it later acquired several M-Turbo™ systems. "The small size and lightweight are great assets in the deployed setting. But hospital emergency departments are crowded, fast moving places, and all of the SonoSite systems I've worked with are easy to grab and go."

The quick boot time, a feature of every SonoSite hand-carried system, including the S-FAST™ ultrasound tool, is vitally important in any environment. "Before hand-carried ultrasound, if we wanted to conduct an ultrasound exam in the ED we had to get a big machine wheeled around, often from another part of the hospital, find an electrical outlet, and then wait while it took time to boot up. With hand-carried ultrasound, I can step up, boot-up, and conduct an examination in minutes.

If you were the patient, which scenario would you prefer?"

[1] Brunette et al, Emergency department echocardiography improves outcome in penetrating cardiac injury. Annals of Emergency Medicine 1992 Jun;21(6):709-12

[2] Plummer D et al, Emergency Department Ultrasound Improves Time to Diagnosis and Survival in Ruptured Abdominal Aortic Aneurysm. Academic Emergency Medicine 1998; 5:417 (abstract)

[3] Rodgerson J et al, Emergency Department Right Upper Quadrant Ultrasound Is Associated with a Reduced Time to Diagnosis and Treatment of Ruptured Ectopic Pregnancies. Academic Emergency Medicine 2008; Volume 8 Issue 4, pp 331-336

[4] Chan S. S. W., Emergency Bedside Ultrasound to Detect Pneumothorax. Academic Emergency Medicine 2003; Volume 10 Issue 1, pp 91-94