

Emergency Ultrasound in Clinical Practice, why the slow spread despite the supposed benefits?

Michael Blaivas

Northside Hospital Forsyth, Cumming, GA, USA

Emergency ultrasound has been in the medical literature and daily use in North America for over twenty years. However, for much of that time it has hardly been a household word outside of a handful of academic centers and isolated community practice hospitals. It is not until recently that emergency or point-of-care ultrasound (as it is known in broader clinical circles) has hit the mainstream of emergency medicine practice. Some of the critical milestones have included the 2001 ACEP ultrasound guidelines, 2004 establishment of ultrasound trainings as part of the core curriculum in residency training and the 2008 ACEP revisions of the ultrasound guidelines [1]. Now, all emergency medicine residencies have to provide ultrasound training and emergency ultrasound questions are standard on in-service and board examinations. Despite this progress and clear indication that multiple emergency ultrasound applications are now considered standard of care, (such as ultrasound guidance for central line placement, evaluation of trauma patients with the FAST examination, focused echo for evaluation of cardiac arrest and pelvic ultrasound in ruling out ectopic pregnancy) penetration into the community practice setting remains relatively poor [2].

The most current data suggests that community practice penetration of emergency ultrasound use hovers just over 30% nationwide [2]. Some areas such as the south east have relatively little penetration in comparison to the Midwest and north east. Surprisingly, even California, once thought to be the bastion of emergency ultrasound showed relatively rare use in a recent study [3]. Given the great utility of point-of-care or emergency ultrasound, supporters and especially zealots are often puzzled why the technology is not ubiquitous in community practice after the last two decades and thousands of published research manuscripts on the topic. Emergency ultrasound has been proved to have utility in a multitude of clinical scenarios, even beyond the original handful of applications. In screening for lower extremity DVTs, emergency physicians are highly accurate and save time as well as money [4-6]. In cases of right upper quadrant and epigastric pain when biliary colic and cholecystitis are on the differential, emergency ultrasound is highly accurate and allows physicians to decrease length of stay in the ED [7-9].

There are good reasons however, why not everyone in emergency medicine practice has come on board with ultrasound use. First, there is an educational barrier. For those who have not been trained to use ultrasound in residency, this is just another burden of adding a new application or technique to their practice. Unlike following a sepsis pathway, ultrasound requires real effort and time commitment before the significant benefits are seen. Those emergency physicians who picked up ultrasound on their own initiative because of curiosity or a natural affinity for new technology are already using it and their ranks are limited. Many of the late adopters are simply not interested. Community emergency medicine practice is largely about survival for many us, especially those more senior physicians not trained in ultrasound. New challenges of patient satisfaction surveys, documentation, burgeoning sedation monitoring requirements and a host of other disruptions to our practice are difficult to keep up with. This is especially the case when an ultrasound from radiology is simply a button click or box check away. The fact that it will add two hours or more to the patients length of stay is simply lost in translation.

While this fact may be shocking to new ultrasound efficianados, it is clear to me, from being immersed in community practice for the last 5 years, that many physicians are not even aware of the potential utility of ultrasound. Most do not read research publications in journals or attend presentations at scientific meetings due to time constraints and lack of interest.

Changing my clinical practice from an academic to a pure community setting revealed that many people view ultrasound as some academic experiment and don't realize how their practice can be impacted by its introduction. Adding ultrasound guidance to central and peripheral lines has revolutionized our ED's vascular access capability and this is even recognized at the hospital administration level. Cardiac arrest resuscitations are no longer a guessing game for most of my partners as they can quickly see if there is any mechanical activity, rule out a pericardial effusion and make a rapid estimate of volume status from a focused echo. Peritonsillar abscess drainage was simply avoided until the introduction of ultrasound gave near perfect results with the first needle pass. Another less obvious example is utilization of ultrasound guided regional anesthesia. With the current burden of documentation and monitoring for conscious sedation for procedures like fracture and dislocation reductions it is almost not worth doing them. However, providing such a service is valued by patients, hospital administration and specialists. When one of my partners or I perform an interscalene block for shoulder dislocation, axillary block for a Coles fracture reduction or popliteal block for a badly fractured or dislocated ankle we save hours. In addition, we save lost RVU's because our care team and is not shut down by losing one nurse for over an hour. You simply block, see other patients, reduce, see other patients, discharge home. Patients love the experience and are invariably grateful. Nurses love it too and happily give me the patients in whom I can avoid conscious sedation. Procedures in my setting mean higher RVUs and much more importantly, more interesting things to do than treating another renal colic patient. All of these applications are easy to learn and are supported by numerous manuscripts published in our medical literature [10-14].

To be fair, one has to admit that continued resistance from radiology has also impacted the spread of emergency ultrasound in community practice. This, sometimes vehement, resistance occurs at the national, regional and local levels on a daily basis. However, it is important to note that many radiologists support emergency physician use of ultrasound. National organizations such as the AIUM have joined with ACEP and other clinical specialty societies in making practice and training guidelines and cooperation between traditional imagers and

Corresponding author: Michael Blaivas, Northside Hospital Forsyth, Cumming, GA, USA, E-mail: mike@blaivas.org

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newer clinical users of point of care ultrasound increases constantly [15]. This increasing support and cooperation has been a great boost for emergency ultrasound proponents, however the ultimate solution will consist of a number of factors. Continued improvement of ultrasound technology, that is now actually designed with emergency physicians and other clinicians in mind makes it easier for novices to use ultrasound. Development of new applications for emergency medicine such as resuscitation protocols, lung ultrasound and many others also regularly entices new users to give ultrasound a try due to the many benefits it has for their clinical practice. Finally, the most significant component will come from outside emergency medicine schools now have four year curricula and that number is spreading. There is a multi-specialty effort, being spearheaded by Society of Ultrasound in Medical Education (SUSME), to introduce ultrasound training as a standard into the four year medical curriculum [16]. Additionally, other allied health personnel like nurses, physicians assistants, emergency medicine technicians and others are also working as part of SUSME to introduce ultrasound into the framework of their training systems. In time, emergency physicians entering practice would have been using ultrasound since their first days of medical school and throughout training. Other clinicians will be just as facile with point of care ultrasound and there will be an expectation for the technology to be used in a wide range of clinical cases. Questions regarding which specialty can or should use ultrasound will be forgotten itself. Medical schools are rapidly introducing ultrasound education through individual efforts around the country. However, several.

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