



Point-of-Care Ultrasound in the Pediatric Emergency Department

Where We're at, Where We're Going

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Key points

- POCUS has changed the landscape of pediatric emergency medicine. Here we summarize the history of pediatric POCUS and several newer applications.
- New and expanded applications and research are being performed that will further show the utility of POCUS in the emergency department and other departments, such as the NICU.
- Learning POCUS via conferences or online learning (Web sites, blogs, or social media) is an alternative option to those with no access to formal training. Resources are listed.



Video content accompanies this article at <http://www.advancesinpediatrics.com/>.

Point-of-care ultrasound (POCUS) is an ideal tool for the pediatric emergency medicine (PEM) provider: it is cost effective compared with other imaging modalities; it is available in most emergency departments (EDs) round-the-clock and thus not limited by time or staffing; it is rapid and can be repeated serially as needed; it is portable and can be brought to the bedside

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of even the most critically ill children; and it avoids the need for sedation and the risk of radiation.

POCUS is becoming more prevalent in academic EDs across the country. For more than 30 years general emergency medicine providers have been actively using POCUS to take care of their patients more efficiently. Since about the start of the millennia there have been dedicated in-house, POCUS fellowships for emergency medicine providers who wished to learn more about this exciting new field. These fellowships are not accredited by the Accreditation Council for Graduate Medical Education (ACGME), but are run internally by specialists in the field. The American College of Emergency Physicians (ACEP) initially required emergency medicine training programs to educate their residents in six core POCUS concepts. These included focused/limited scanning of the following: aortic, biliary, renal, cardiac, focused assessment with ultrasonography in trauma (FAST), and intrauterine pregnancy recognition. These applications have been expanded to include many other lifesaving examinations involving lung, deep veins for thrombosis, and procedural uses to just name a few [1].

PEM providers were slower than emergency medicine when it came to adopting POCUS for patient care. Much of the evidence suggesting the utility of ultrasound to PEM comes from other disciplines, such as adult emergency medicine, critical care, and anesthesia. The first PEM providers who did POCUS fellowships did them within general emergency medicine POCUS fellowships. In 2010 the first PEM POCUS fellowship run by a PEM POCUS fellowship trained physician opened. As of the 2017 emergency ultrasound fellowship match there are 11 pediatric-specific POCUS fellowships in the country [2]. As the number of specialized providers increases, more PEM fellowships will incorporate POCUS into their training. If a program does not have a PEM POCUS provider, the fellows can rotate with general emergency POCUS providers, but this brings variability to the educational experience. Currently, unlike the general emergency medicine ACGME program requirements, POCUS is not a mandatory ACGME competency in a PEM program [3]. This is changing rapidly with current experts in the field just publishing guidelines specific to pediatric POCUS to build an educational “how to” framework to ensure uniform training [4]. Members of that group are also working on curricula guidelines to be incorporated into PEM fellowship training. Searching PubMed resulted in more than 30 articles published on pediatric POCUS in 2017, compared with seven in 2011. These facts speak to the explosive growth of pediatric POCUS in the last few years and the recognition that it is a vital part of emergency patient care. This article highlights some of the newer advances in POCUS in the pediatric ED (PED) and critical care areas and resources for learning.

ADVANCES IN PEDIATRIC POINT-OF-CARE ULTRASOUND

Abdominal sonography

In advanced PEM POCUS programs, it is commonplace to see providers performing scans looking for intussusception, appendicitis, and pyloric stenosis.

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