

Policy Statement



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Ultrasound Guidelines: Emergency, Point-of-Care and Clinical Ultrasound Guidelines in Medicine

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SECTION 1 - INTRODUCTION

Ultrasound (US) has become an integral modality in emergency care in the United States during the last two decades. Since the last update of these guidelines in 2008, US use has expanded throughout clinical medicine and established itself as a standard in the clinical evaluation of the emergency patient. There is a wide breadth of recognized emergency US applications offering advanced diagnostic and therapeutic capability benefit to patients across the globe. With its low capital, space, energy, and cost of training requirements, US can be brought to the bedside anywhere a clinician can go, directly or remotely. The use of US in emergency care has contributed to improvement in quality and value, specifically in regards to procedural safety, timeliness of care, diagnostic accuracy, and cost reduction. In a medical world full of technological options, US fulfills the concept of "staged imaging," where the use of US first can answer important clinical questions accurately without the expense, time, or side effects of advanced imaging or invasive procedures.

Emergency physicians have taken the leadership role for the establishment and education of bedside, clinical, point-of-care US use by clinicians in the United States and around the world. Ultrasonography has spread throughout all levels of medical education, integrated into medical school curricula, through residency, to postgraduate education of physicians, and extended to other providers

such as nursing, advanced practice professionals, and prehospital providers. US curricula in undergraduate medical education is growing exponentially due to the leadership and advocacy of emergency physicians. US in emergency medicine (EM) residency training has now been codified in the Accreditation Council for Graduate Medical Education (ACGME) Next Accreditation System (NAS). Emergency US specialists have created the foundation of a subspecialty of ultrasonography that provides the expertise for establishing clinical practice, educating across the educational spectrum, and researching the wide range of applications of ultrasonography. Within healthcare institutions and healthcare systems, emergency physicians are now leading institutional clinical US programs that have used this guideline as a format for multidisciplinary programs.

US imaging and information systems have become more sophisticated and digital over the last decade allowing emergency US examinations to have versatility, mobility and integration. US hardware for emergency care has become more modular, smaller, and powerful, ranging from smartphone size to slim, cart-based systems dedicated to the emergency medicine market. US hardware has evolved to allow on-machine reporting, wireless connectivity and electronic medical record (EMR) and picture archiving and communication system (PACS) integration. A new software entity, US management systems, was created to provide administrative functionality and the integration of US images into electronic records. Emergency physician expertise was integral in the development of these hardware and software advances.

These guidelines reflect the evolution and changes in the evolving world of emergency medicine and the growth of US practice. Themes of universality of practice, educational innovation, core credentialing, quality improvement, and value highlight this new edition of the guidelines. The ultimate mission of providing excellent patient care will be enhanced by emergency physicians and other clinicians being empowered with the use of US.

SECTION 2- SCOPE OF PRACTICE

Emergency Ultrasound (EUS) is the medical use of US technology for the bedside evaluation of acute or critical medical conditions.¹ It is utilized for diagnosis of any emergency condition, resuscitation of the acutely ill, critically ill or injured, guidance of procedures, monitoring of certain pathologic states and as an adjunct to therapy. EUS examinations are typically performed, interpreted, and integrated into care by emergency physicians or those under the supervision of emergency physicians in the setting of the emergency department (ED) or a non-ED emergency setting such as hospital unit, out-of-hospital, battlefield, space, urgent care, clinic, or remote or other settings. It may be performed as a single examination, repeated due to clinical need or deterioration, or used for monitoring of physiologic or pathologic changes.

Emergency US is synonymous with the terms clinical, bedside, point-of-care, focused, and physician performed, but is part of a larger field of clinical ultrasonography. In this document, EUS refers to US performed by emergency physicians or clinicians in the emergency setting, while clinical ultrasonography refers to a multidisciplinary field of US use by clinicians at the point-of-care.² Table 1 summarizes relevant US definitions in EUS.

Other medical specialties may wish to use this document if they perform EUS in the manner described above. However, guidelines which apply to US examinations or procedures performed by consultants, especially

consultative imaging in US laboratories or departments, or in a different setting may not be applicable to emergency physicians.

Emergency US is an emergency medicine procedure, and should not be considered in conflict with exclusive “imaging” contracts that may be in place with consultative US practices. In addition, emergency US should be reimbursed as a separate billable procedure.³ (See Section 6- Value and Reimbursement)

EUS is a separate entity distinct from the physical examination that adds anatomic, functional, and physiologic information to the care of the acutely-ill patient.⁴ It provides clinically significant data not obtainable by inspection, palpation, auscultation, or other components of the physical examination.⁵ US used in this clinical context is also not equivalent to use in the training of medical students and other clinicians in training looking to improve their understanding of anatomic and physiologic relationships of organ systems.

EUS can be classified into the following functional clinical categories:

1. *Resuscitative*: US use as directly related to an acute resuscitation
2. *Diagnostic*: US utilized in an emergent diagnostic imaging capacity
3. *Symptom or sign-based*: US used in a clinical pathway based upon the patient’s symptom or sign (eg, shortness of breath)
4. *Procedure guidance*: US used as an aid to guide a procedure
5. *Therapeutic and Monitoring*: US use in therapeutics or in physiological monitoring

Within these broad functional categories of use, 12 core emergency US applications have been identified as Trauma, Pregnancy, Cardiac /Hemodynamic assessment, Abdominal aorta, Airway/Thoracic, Biliary, Urinary Tract, Deep Vein Thrombosis (DVT), Soft-tissue/Musculoskeletal (MSK), Ocular, Bowel, and Procedural Guidance. Evidence for these

Table 1. Relevant Ultrasound Definitions.

Resuscitative	US use directly related to a resuscitation
Diagnostic	US utilized a diagnostic imaging capacity
Symptom or sign-based	US used in a clinical pathway based upon the patient’s symptoms or sign (eg, shortness of breath)
Therapeutic and Monitoring	US use in therapeutics or physiological monitoring
Procedural guidance	US used as an aid to guide a procedure
Consultative Ultrasound	A written or electronic request for an US examination & interpretation for which the patient is transported to a laboratory or imaging department outside of the clinical setting.
Emergency Ultrasound	Performed and interpreted by the provider as an emergency procedure and directly integrated into the care of the patient
Clinical Ultrasound	US used in the clinical setting, distinct from the physical examination, that adds anatomic, functional and physiologic information to the care of the acutely ill patient.
Educational Ultrasound	US performed in a non-clinical setting by medical students or other clinician trainees to enhance physical examination skills. Exams usually performed on cadavers or live models.

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