

Ultrasound in the Air Medical Environment

Position Statement of the Air Medical Physician Association

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Background

The utility of ultrasound in the emergency medicine setting is well established. Ultrasound has proven to be effective and critical to improving bedside diagnosis, monitoring of a patient's response to treatment, and in improving the safety of procedures. With improvements in size, portability, and cost, there is increasing interest in utilizing ultrasound in the prehospital environment.¹ The Air Medical Physician Association believes that prehospital ultrasound use requires programs to provide adequate training, a robust quality assurance program, and safeguards to ensure that ultrasound use does not delay transport. Ultrasound use when clinically indicated is paramount.

Training

Prehospital ultrasound use is a relatively new procedure and has not traditionally been taught during paramedic or nursing school. As a result, the majority of practicing air medical providers have not had formal training in its use. Therefore, programs utilizing ultrasound must ensure that providers participate in a formal initial training program. Such program should include both a didactic and practical component.

Initial didactic training should at a minimum discuss the following:

1. *Identify the function of basic controls of the ultrasound machine*
2. *Discuss the basic physics principles of ultrasound*
3. *Demonstrate how to optimize ultrasound images*
4. *Describe normal ultrasound anatomy*
5. *Describe common pathological ultrasound anatomy*
6. *Discuss basic ultrasound artifacts and their use*
7. *Describe the expectations of ultrasound imaging during patient care encounters.*

Initial practical training should at a minimum involve the following:

1. Procedural skills utilizing an ultrasound standardized patient, task-trainer, and/or phantom prior to live human attempts.
2. Image acquisition and interpretation of studies involving ultrasound standardized patients and scanning on live humans where normal and abnormal scanning anatomy can be found.

Quality Assurance / Quality Improvement

As with Emergency Ultrasound (EUS), ultrasound use by critical care transport personnel should have a thorough and sufficient quality assurance (QA) and quality improvement (QI) plan.² The QA/ QI process is an essential component for integration of ultrasound into prehospital care.

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Programs integrating the use of ultrasound in patient care should concurrently develop a thorough QA/ QI process. The American College of Emergency Physicians Emergency Ultrasound Imaging Criteria Compendium can be utilized to guide the QA/ QI process.³

In agreement with the ACEPs Ultrasound Program Management, the QI process should attempt to achieve the following:

1. Ability to obtain and capture images or clips for review
2. Critical care pre-hospital personnel must document relevant findings/interpretation for each study/ procedure
3. Images are to be reviewed by a medical director, ultrasound QA expert, or providers who are appropriately qualified and experienced in EUS
4. Feedback should be provided to the prehospital personnel on technical skills as well as clinical interpretations
5. Feedback should be reviewed by all parties in a timely manner.
6. All data, images, and clips including documentation and feedback should be securely stored for additional review
7. Creation of processes for communication with the patient, providers, and receiving facilities after identifying missed or incidental findings

References

1. Brooke M, Walton J, Scutt D. Paramedic application of ultrasound in the management of patients in the prehospital setting: a review of the literature. *Emerg Med J.* 2010;27(9):702-7.
2. Tayal, Vivek S., et al. *Ultrasound Program Management: A Comprehensive Resource for Adminstrating Point-of-Care, Emergency, and Clinical Ultrasound.* Springer International Publishing, 2018.
3. *Emergency Ultrasound Imaging Criteria Compendium. Ann Emerg Med.* 2016;68(1):e11-48.

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