

Lecture Title: Point of Care Ultrasound (POCUS) of the Abdomen  
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### **Summary:**

This presentation is an initial approach to training emergency medicine veterinarians in focused abdominal ultrasound exams (aFAST: **a**bdominal **F**ocused **A**ssessment using **S**onography for **T**rauma, **T**riage, and **T**rending). The more appropriate term is Point of Care Ultrasound (POCUS). Trainees can then build on these topics with direct supervision and didactic training from experienced veterinarians and ultrasound technicians. Following a review of the basics of ultrasound physics, some general indications for focused ultrasound examinations in veterinary practice will be discussed. The indications are based on peer reviewed articles and common procedures performed at the Animal Medical Center.

#### *The Perspective in Human Patients*

The bedside ultrasound exam has evolved into its own discipline. The American Medical Association and the American College of Emergency Physicians recognize emergency physician-performed ultrasound examinations. Acceptance of the focused ultrasound examination by other specialty organizations has perhaps been an uphill battle. Some providers of consultative ultrasound services recommend training standards for practitioners outside their own specialties that far exceed the standards accepted by emergency medicine authorities. Despite differences in standards of training, the emergency ultrasound examination's worth is proven in peer-reviewed journals for numerous clinical scenarios including trauma, abdominal aortic aneurysms, ectopic pregnancy, pericardial effusion, cardiac activity, and procedure guidance.

#### *A Veterinary Perspective*

An initial review article on emergency veterinary ultrasound examinations was published in 1988. Since then, the use of focused ultrasound examinations in critical veterinary patients has been grown exponentially. The radiology department at my institution (AMC) works closely with the emergency/critical care department to train emergency clinicians every year (didactic lectures and laboratories). However, standards for training these focused emergency exams have not been established by any specialty organization.

Indications for focused emergency ultrasound examinations are generally based on prior suspicion of a particular disease. The most well established indication in both human and veterinary patients is for the identification of fluid in cases of trauma. This is probably because fluid identification (whether it be in an infected uterus, around the heart, or within the peritoneum) is a specific and relatively simple positive finding to interpret. Other common aFAST diagnoses made by our emergency clinicians includes identification of a living fetus, intussusception (mechanical obstruction of the GI tract), gallbladder mucocele, septic peritonitis, or high-grade hydronephrosis. One can see that as we add to this list, the room for error in interpretation can increase. Furthermore, some of these diagnoses may not require immediate therapeutic intervention. Emergency clinicians must weigh the confidence of their interpretation with the urgency of the diagnosis.

A most appropriate position for aFAST has not been determined. There are advantages to left lateral over right lateral recumbancy or sternal recumbancy. The one position generally regarded as inappropriate for the emergency patient is dorsal recumbancy. aFAST techniques are often modified to address specific clinical questions. For example, if the patient presents with hematuria or vomiting, the examination would be modified to assess kidneys/bladder or GI tract/pancreas. Hyperechoic fat is generally a sign of inflamed omentum or mesentery (peritonitis). Assessing the whole abdomen gives the examiner an appreciation for areas of abdominal fat that are normal versus hyperechoic (bright). This generally takes more time than

the typical aFAST exam but can narrow differential diagnoses and help guide needle placement to areas of the abdomen that may provide a more diagnostic fluid sample. Hyperechoic fat is generally a sign of inflamed omentum or mesentery (peritonitis). Assessing the whole abdomen gives the examiner an appreciation for areas of abdominal fat that are normal versus hyperechoic (bright). This generally takes more time than the typical aFAST exam but can narrow differential diagnoses and help guide needle placement to areas of the abdomen that may provide a more diagnostic fluid sample.

### **Key Learning Objectives:**

- *Decisions regarding patient positioning for aFAST depend on patient comfort/stability as well as the objective of the examiner.*
- *Four specific sites are routinely imaged in the aFAST technique, to include cranial midline (diaphragmatic-hepatic, DH), right lateral (hepato-renal, HR), left lateral (spleno-renal, SR), and caudal midline (cystocolic, CC).*
- *Hyperechoic fat should guide the examiner to clinically significant lesions*

### **REFERENCES:**

Lisciandro G. Abdominal and thoracic focused assessment with sonography for trauma, triage, and monitoring in small animals. J Vet Emerg Crit Care. 2011; 21:104-22

Cosby KS, Kendall. Practical guide to emergency ultrasound. WB Saunders. 2008