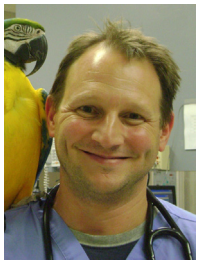
Preface

Point-of-Care Ultrasound: —The Awakening of a Sleeping Giant



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In 1999, as a general practitioner, I declared my first attempt at learning ultrasound a failure after taking an abdominal ultrasound course. Thus, 7 years later as a resident in emergency and critical care (2005-2007), I was resistant to making FAST ultrasound part of my clinical research requirement. The phrase by my Intern Director (1991), the late Dr Michael Garvey, has always been part of my daily practice since: "never send a patient out the door (home) with something you could easily have diagnosed." Shortly after learning and routinely applying AFAST and TFAST as an extension of the physical exam in 2005 (and later Vet BLUE, 2010), these FAST ultrasound examinations became part of my quick assessment tests.

In our original study, case number 7 of 101 dogs, a dog named Zeke, presented collapsed and in hypovolemic shock after having been hit by a car 45 minutes earlier. With traditional training, I would have fallen for the obvious radiographic pneumothorax (and only a slight decrease in abdominal serosal detail ruling against a hemoabdomen) being the cause of his clinical signs. However, on AFAST, Zeke had the highest abdominal fluid score of 4, and the abdominocentesis and fluid testing confirmed his hemoabdomen. Also, of note, he was the first pneumothorax case I diagnosed using TFAST knowing of the pneumothorax *before* the radiograph.

The hemoabdomen was the major player contributing to his shock along with a comorbidity of pneumothorax. I was completely misled by radiography and clinical impression without ultrasound. Zeke survived. All this information that allowed a more accurate clinical course was acquired on presentation with point-of-care AFAST and TFAST within a few minutes. From this case, I not only was hooked but also had the epiphany that I could do ultrasound and was also convinced of the need to always look in both cavities to best evaluate the patient. AFAST and TFAST were initially called Combo FAST until Vet BLUE was developed, which led to the examination being named Global FAST.

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We created AFAST after the original FAST study by Dr Søren Boysen and colleagues out of Tufts, published in 2004. AFAST changed the direction of the scanning plane more strategically into gravity-dependent pouches. It also added the umbilical view and took on a new mindset of not only a target-organ approach for soft tissue abnormalities but also an abdominal fluid scoring system to better categorize patients with ascites. At the same time, we created TFAST for a rapid assessment of the thorax not only for pleural and pericardial effusion but also for pneumothorax and brief echocardiography. In 2010, we created Vet BLUE, and never in my wildest dreams had I thought that proactive lung ultrasound would be so impactful for improving patient care (and easy to learn). This has become one of our proudest achievements, as so many colleagues had underestimated the value of what we had begun.

As a resident, I can still remember reading "Ultrasound in the management of thoracic disease" by Daniel Lichtenstein, in the journal *Critical Care Medicine* (2007). Lichtenstein concluded that we (point-of-care sonographers) had awakened the "sleepy giant" in terms of its applications and potential to improve patient care. Thus, we too in veterinary medicine have awakened its potential with an explosion of applications in the past few years. In veterinary medicine, we have been handed a rare opportunity to be ahead of our physician colleagues in making standardized goal-directed point-of-care ultrasound (POCUS) a core skill.

Dr Jennifer Gambino, a board-certified veterinary radiologist, and I met over a decade ago during her tenure at Mississippi State University, while doing the first issue of our textbook. She cowrote with Dr Søren Boysen an article on Focused Gastrointestinal and Pancreas Ultrasound and contributed input on some of the other abdominal organ articles. She saw the immediate value in more abbreviated structured training (FAST and Focused examinations) of nonradiologist veterinarians over comprehensive ultrasound examinations, the latter a difficult skill to gain proficiency.

Moreover, she saw the potential for these abbreviated FAST and Focused formats to serve as an important and valuable screening test that could capture significant disease that would have otherwise been missed without ultrasound use early in the triage process. Not only were cases with significant disease captured, but also treatment was more evidence based with the potential to keep patients alive for later gold-standard imaging (her area of expertise). Of special note, Dr Gambino's preference for alcohol-based hand sanitizer gel as an excellent coupling medium for ultrasound (over coupling gel) came to my attention, a brilliant discovery.

Which brings us to our next point: the development of this issue came to fruition during a time perhaps when hand sanitizer was a scarce commodity: the COVID 19 pandemic. We all felt the impact of the pandemic (eg, surging case numbers, curbside appointments, and busier-than-ever schedules). Never before has goal-directed POCUS been more relevant, and never before has our profession been as ready to adapt its principles for better patient care and improved outcomes.

So, let's define veterinary POCUS! It includes FAST ultrasound examinations, defined as a goal-directed ultrasound examination performed by a veterinary health care provider "cage side" (or bringing imaging to the patient) to answer a specific diagnostic question or questions or guide performance of an invasive procedure (**Fig. 1**). Global FAST, a term coined in 2010, is the combination of AFAST (abdomen), TFAST (thorax), and Vet BLUE (lung). Focused or POCUS exams are interchangeable terms that refer to target imaging of specific organs or systems.

There are some important features of POCUS that the reader should be aware of. First, these should be considered screening tests that are user-dependent founded on proper training. Second, recording findings on goal-directed templates (data entry forms) and archiving studies with good image acquisition make it clear to our

Fig. 1. Veterinary POCUS allows for cage-side (or at the patient's side) imaging. (*Courtesy of* Dr Gregory Lisciando, Hill Country Veterinary Specialists and FASTVte.com.)

colleagues what the objectives of the POCUS examination were, while keeping the sonographer disciplined and on task. Third, targeted or focused POCUS can lead to image interpretation errors, such as satisfaction of search error, stopping at the first major abnormality, and confirmation bias error through selective imaging (picking and choosing what will be imaged). Global FAST is an approach in which an unbiased set of data imaging points is acquired of both the abdomen (AFAST) and the thorax (TFAST and Vet BLUE) from which the sonographer may do additional POCUS examinations. Thus, Global FAST helps eliminate such image interpretation errors.

We are excited about this issue and the article authors who have generously given their time and expertise as leaders in this new frontier of veterinary medicine that undoubtedly is a game-changer for patient care. We also want to recognize all those in the radiology community who have spent untold numbers of hours of due diligence and time studying ultrasound. By publishing their research, they have created the foundation for the nonradiologist sonographer.

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