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Letters to the Editor

Is it Time for Ultrasound in Cardiac Arrest?

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Advocacy for Modern Triage Tools

To the Editor:

We read with great interest the article by Cannon et al.[1] in the December issue of the *Journal of Trauma*, studying the shock index defined as the ratio of systolic blood pressure/heart rate. This could seem like revisiting the index of Buffington et al.[2,3] (the quotient of mean arterial pressure and heart rate), introduced 20 years ago. The authors evaluated the utility of the shock index as an early predictor of mortality risk in traumatically injured patients and as a triage tool. This is a crucial topic as far as adequate triage is the key for surviving. We want to emphasize that the focused assessment with sonography in trauma (FAST) is today the cornerstone of triage.[4] Ultrasound has been used in the field and in the emergency departments for more than two decades. Its use has grown rapidly as it gained widespread acceptance among emergency physicians and as the range of diagnostic and triage applications has continued to expand. Sonography for victims of blunt abdominal trauma was one of the first applications for FAST in emergency medicine. In addition, for patients with multiple injuries, FAST helps to prioritize operative management (in conjunction with clinical history and physical examination). Melniker et al. published the First Sonography Outcomes Assessment Program Trial, a randomized, controlled clinical investigation. The authors proved that ultrasound reduced the time from emergency department presentation to operative care (57 minutes vs. 166 minutes).[5] With growing evidence regarding its benefit, the FAST examination remains the most commonly used and widely accepted triage tool. It is quickly performed, noninvasive, and inexpensive. And, many modern evidence-based trauma protocols have included FAST examination as a pivotal axis in the triage decisions. The challenge for the future is to develop effective triage systems, integrating both modern ultrasound imagery and physical examination, to identify patients who require the best available emergency response for trauma problems and to focus the limited resources using a sensitive and specific system.

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Emergency Department Thoracotomy for Gunshot Wounds of the Heart and Great Vessels

To the Editor:

We thank Dr. Moore for his editorial response to our recent article.[1] Perhaps no procedure in trauma surgery elicits emotion as does the emergency department thoracotomy (EDT). Following its inception, reports advocating the limited application of EDT due to limited salvage rates and occupational risks has led to a more selective approach based on survival predictors (injury mechanism, anatomic injury, cardiac rhythm, vital signs, and signs of life [SOL]). Although patients with cardiac injuries were previously reported[2] to have the greatest EDT survival potential, recent experience from our institutions has not supported these findings.[1]

There are several explanations for our differing results. Over 88% of patients in our series sustained cardiac or great vessel *gunshot wounds* (CGV GSW), the greatest percentage of CGV firearm injuries treated with EDT reported to date. These were observed CGV wounds, not wounds of the pericardial sac. Scrutiny of other major penetrating cardiac series described throughout our article's discussion reveals the vast majority of EDT survivors sustained cardiac stab wounds, not GSW. Our EDT series reveals similar findings; 24% of patients sustaining CGV stab wounds survived, whereas only 3% (Fig. 1, $p < 0.001$) survived CGV GSW. The current epidemiology of interpersonal violence with its dominance of firearms in major American cites is the primary reason why our report contradicts previous findings.[3] Also crucial though is the change in contemporary urban weaponry reported since the mid 1990s—a trend which has replaced 0.22 caliber revolvers with higher muzzle velocity pistols firing larger and more bullets and left wounded patients with less chance of survival.[4]

Injury mechanism and anatomic injuries are closely related to presenting physiology. In our series, only 9% of 250 patients who underwent EDT for CGV GSW had perfusing cardiac rhythms and a mere 13% had *any* vital sign. By utilizing the liberal SOL definition provided by the American College of Surgeons/Committee on Trauma Practice management guidelines for EDT (pupillary response, respirations, pulse, blood pressure, movement, or any cardiac electrical activity),[2] 62% had *any* ED SOL, including any recorded electrical activity, before EDT. As our EDT series was comprised almost entirely of CGV GSW with critical physiologic impairment, patients with deterio-