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1. Thiruganasambandamoorthy V, Hess E, Alreesi A, et al. External validation of the San Francisco Syncope Rule in the Canadian setting. *Ann Emerg Med.* 2010;55:464-472.
2. Quinn JV, Stiell IG, McDermott DA, et al. Derivation of the San Francisco Syncope Rule to predict patients with short-term serious outcomes. *Ann Emerg Med.* 2004;43:224-232.
3. Quinn JV, McDermott DA, Stiell IG, et al. Prospective validation of the San Francisco Syncope Rule to predict patients with serious outcomes. *Ann Emerg Med.* 2006;47:448-454.
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In reply:

We thank Drs. Quinn and McDermott for their comments and commend their seminal work on the topic of syncope. Their published articles of the derivation and validation phases of the San Francisco Syncope Rule study did not specify cardiac monitoring and leave the issue unclear for clinicians.[1,2] We agree that emergency physicians should use all available resources (clinical or ECG) in making the disposition decision about syncope patients. Hence, we reported sensitivities for the rule with and without monitoring in our article.[3] The point that we are attempting to make in our study is that there were 4 patients who had no new ECG changes yet developed arrhythmias later (3 while in the ED and 1 outside the ED). The arrhythmias occurred at 34, 45, and 395 minutes after admission to the ED. The fourth patient experienced arrhythmia outside the hospital 4 hours after discharge from the ED. This scenario of arrhythmia occurring after discharging the patient could very well have happened with the first 3 patients if they had not been monitored. Some syncope patients clearly need further monitoring or admission and cannot be discharged on the basis of no new changes in the ECG.

In summary, we agree that emergency physicians should use all available resources in making disposition decisions about adult ED syncope patients. Further research is also required to identify which syncope patients need cardiac monitoring and the duration of such monitoring.

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Have We Killed the Golden Hour of Trauma?

To the Editor:

The study by Newgard et al[1] in the March issue of *Annals* proposed to set the record straight on the "golden hour" of trauma, one of the best-holding dogmas in medicine.[2] They measured the association between emergency medical services (EMS) intervals and mortality among 3,656 trauma patients with substantial abnormal vital signs/mental status, transported by 146 EMS agencies to 51 trauma centers across the United States and Canada. They found no correlation. The associated capsule mentioned that ". . . time may be less crucial than once thought. Routine lights and sirens transport for trauma patients . . . may not be warranted."

Being involved in rural emergency care, we fear this study might be misinterpreted, with unfortunate consequences on patient care. We envision health administrators waving this article as proof we no longer need to invest as much in the timely care of trauma patients. They will initiate transport cuts and reduce staff and funding of trauma centers. If time is not that big an issue, then the neighboring trauma center will do. Will a few extra minutes in the trauma bay hurt? Is it now time to chop, chop the choppers? And what about those rural hospitals we find so hard to staff and fund, where courageous solo physicians and staff manage critically injured citizens awaiting transfer? Could accepting centers simply say, what's the rush?

Luckily, as we delve deeper into the study, we realize the golden hour may still be alive!

First, no one is certain about how intervals should be compiled. At least 3 links in trauma care can be identified: (1) the time from the event to the 911 call; (2) EMS total transport time; and (3) the interval from arrival to definitive care. Newgard et al[1] focused solely on number 2, EMS transport. Indeed, the other links may yet be impossible to assess but have significant influence. How can one consistently determine the *exact* time a trauma occurred? In the study by Newgard et al,[1]

1,385 patients who died on scene were excluded. For these patients, we ignore the exact interval from trauma to EMS intervention and cannot conclude that time had no effect on their death. The second missing link is the time to definitive care. But what defines it? Emergency department care? Surgery? The study clock stopped on arrival at the trauma center. How long was it before "definitive" or lifesaving interventions occurred? What was the effect of these interventions?

Furthermore, the results in the Newgard et al[1] study have limited external validity. They exclusively focused on direct transports to Level I and II centers. Indeed, 2,104 patients with presumed equally abnormal vital signs transported to Level III, IV, and V centers were excluded. The authors stipulate that involved trauma centers provide rural care, but reported total EMS intervals well under 45 minutes imply that few genuine rural/remote patients were included. And yet, 30% of Canadians and 50 million Americans live rurally!

Sometimes old dogmas help save lives, allowing people with diverse levels of knowledge to grasp a simple concept. The golden hour of trauma is a classic example of this, and, as imperfect as it is, the concept of timely care must survive; no need to reset your clocks.

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2. Lerner EB, Moscati RM. The golden hour: scientific fact or medical "urban legend"? *Acad Emerg Med*. 2001;8:758-760.

In reply:

We appreciate the comments and interest by Drs. Fleet and Poitras about our recent article assessing the relationship between emergency medical services (EMS) intervals and survival among trauma patients.[1] Although we did not find an association between shorter intervals and improved survival, we do not believe that the "golden hour" is dead. There is a large clinical experience base to suggest that time directly affects outcome for some trauma patients. However, as we detailed in our article, both past and current efforts to objectively demonstrate and quantify such a relationship have generally not been fruitful.

If we assume that there is a time-dependent nature to maximizing health outcomes for certain trauma patients, then several potential explanations exist for our findings. First, it is possible that the other 2 time segments (time of injury to 911 contact and time from hospital arrival to definitive care) have a greater effect on outcome or that failure to account for them diminishes a potential relationship between EMS time and trauma outcomes.

Second, although trauma patients are commonly considered a uniform group, such patients actually represent a very heterogeneous population. Some trauma patients have life-threatening clinical conditions that require time-dependent definitive care, whereas others have relatively minor injuries without a strict time-dependent component. Accurately identifying seriously injured patients requiring immediate trauma care early in their clinical course is an imperfect process, even when restricted to patients with physiologic compromise.[2,3] Such heterogeneity in a patient population creates challenges in demonstrating the effect of time on outcome when a portion of patients have no time-dependent condition.

Finally, there is strong unmeasured confounding that challenges any observational effort to demonstrate a link between time and outcome among injured patients. That is, out-of-hospital providers tend to move faster when caring for sicker, higher-acuity patients with an inherently worse prognosis (ie, those most likely to benefit from rapid care) and tend to take relatively more time among patients with less serious injuries. Because clinical severity is incompletely captured with traditional markers of injury severity, some level of confounding persists in such analyses. Including patients taken to lower-level trauma centers or nontrauma hospitals tends to worsen such confounding. The primary analysis was restricted to Level I/II patients to minimize the inherent confounding that plagues this research question; inclusion of patients transported to Level III, IV, and V centers did not qualitatively change our findings.

The critical assessment of traditional dogma is not a threat to trauma systems and trauma centers, but rather functions as an essential component of continued trauma system development and enhancement. Although there is compelling information that both trauma systems and trauma centers improve outcomes among seriously injured patients,[4-6] many questions remain about which factors actually drive these benefits. High-quality, rigorous investigation and exploration of the multitude of factors involved in trauma care offers an opportunity to evaluate which aspects of trauma systems have the greatest effect on patient outcomes and therefore represent the best targets for system enhancement. Because trauma resources are not infinite (a reality even more apparent among rural regions), efforts to