

Improving Postarrest Care Through Evidence-Based Common Sense

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Out-of-hospital cardiac arrest is an important public health challenge in the United States. Effective cardiac arrest treatment requires well-informed and action-oriented bystanders, high-performing emergency medical services (EMS), and attentive postarrest care. The latter component requires multidisciplinary coordination of numerous elements, including temperature management, cardiac assessment and intervention, ventilator management, hemodynamic optimization, and structured neurologic evaluation, among other supportive actions.¹ This organization of multiple domains resembles other familiar models of care for time-critical conditions such as trauma, myocardial infarction, and stroke.² Some experts advocate that EMS directly transport postarrest patients to regional centers where the personnel, equipment, and specific expertise exist, a course modeled after success in treating these conditions.³⁻⁵

In this issue of *Annals*, Spaite et al⁶ report on a statewide effort to regionalize out-of-hospital cardiac arrest care. After a stakeholder meeting in 2007, the Arizona Department of Public Health designated a network of cardiac receiving centers that offered specialized care for postarrest patients, including therapeutic hypothermia, early coronary angiography and percutaneous coronary intervention, and guideline-based critical care.⁷ EMS leaders directed the transport of postarrest patients—with or without return of circulation—to these centers. In an evaluation of 2,177 patients treated before and after implementation of this system, Spaite et al⁶ found that the regionalization strategy increased therapeutic hypothermia use from 0% to 44% and nearly tripled coronary angiography use. Outcome differences included a 61% improvement in survival across all rhythms and nearly doubled survival among victims with initially shockable rhythms. In short, regionalization affected care and improved important patient-centered measures.

Critics will argue that the study by Spaite et al⁶ cannot demonstrate the effectiveness of regionalized postarrest care, notably because of the limits inherent in before-after designs, including the effect of secular trends and unmeasured confounders that could magnify the observed outcome effects.

For example, were patients transported later simply “better” before delivery in the postintervention interval, that is, more likely to do well no matter what care occurred? In addition, Spaite et al⁶ cannot assess the quality of care delivered by cardiac receiving centers aside from their voluntary commitment to the regionalization program and the use of therapeutic hypothermia and percutaneous coronary intervention. At the onset of the investigation, these centers were not providing therapeutic hypothermia, making performance gains easier to demonstrate. The absence of data on transport pattern changes limits our ability to assess the economic consequences of regionalization on both cardiac receiving centers and other destination hospitals.

Spaite et al⁶ offer analyses to mitigate many of these concerns, but potential threats remain, given the before-after design. The optimal method to evaluate the benefit of regionalized postarrest care is a controlled trial randomly assigning patients experiencing out-of-hospital cardiac arrest to different strategies. Although ideal, this design would face many barriers. Providing optimized out-of-hospital care for the cardiac arrest patient is complex and could affect observations even with a randomized approach.

Randomizing transport destinations in this context is also an operational challenge. In addition, EMS providers and the public may not accept the notion of transporting to a center that clearly lacks resources or expertise to care for these patients. Given these considerations, the design and data by Spaite et al⁶ become the best, albeit imperfect, evidence on which to base policy and practice.

Detractors may chastise the study by Spaite et al⁶ as merely an effort to promote best practices in postarrest care, something possible in many settings. However, isn't the promulgation and operationalization of state-of-the-art care *the* goal of regionalization?⁵ The most rapid adoption of evidence-based practice and improvement in outcomes often occurs through concentrating resources and expertise rather than publication and attempts to widely diffuse the knowledge. For example, rapid access to primary percutaneous coronary intervention for ST-segment elevation myocardial infarction emerged only after the adoption of organized care networks. Change of practice and regionalization are closely intertwined concepts; guiding cardiac arrest victims to specialized centers so that they can receive the best postarrest care is common sense.

We must remember that the study by Spaite et al⁶ is the capstone of more than a decade of initiatives to improve all aspects of cardiac arrest care in Arizona, including increasing rates

of bystander cardiopulmonary resuscitation and optimizing EMS chest compression and ventilatory techniques.⁸⁻¹³ One can only imagine the countless operational, logistic, and political barriers that governmental, physician, hospital, and EMS leaders overcame behind the scenes to make the system a reality. Whether or not we agree with the study results, there is a clear broader lesson; well-organized and motivated government agencies partnering with physician, hospital, and EMS champions can improve the health of our communities. Rather than debate the merits of the study by Spaite et al,⁶ we should use the Arizona example as inspiration to improve the delivery of *best* emergency care to *more* patients.

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