

## Excluding the Elephant in the Room: Cardiac Arrest

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**M**ission: Lifeline is a multifaceted and multidisciplinary program consisting of a variety of web-based tools and feedback mechanisms to help emergency medical systems, nurses, and physicians achieve guideline-recommended care for patients presenting with ST-segment–elevation myocardial infarction (STEMI). It is sponsored by the American Heart Association and has been implemented nationally, helping coordinate efforts between emergency medical systems and hospitals. Mission: Lifeline provides a framework to develop regional systems of STEMI care and focuses on reducing barriers that hospitals face in offering timely reperfusion for patients with STEMI. Since its inception, the Mission: Lifeline program has been adopted by nearly 500 hospitals. It represents one of the farthest-reaching and ambitious quality improvement initiatives for STEMI care ever established. This network has immeasurable potential to inform and optimize the state of STEMI care in the United States.

In this issue of the *Journal of the American Heart Association (JAHA)*, Granger et al describe the improvements in regional STEMI care realized through the Mission: Lifeline program.<sup>1</sup> The authors describe the care and outcomes for patients presenting with STEMI from 2008 to 2012 at hospitals enrolling in the Mission: Lifeline program. They demonstrate significant improvements in measured quality metrics over the first 5 years of the program. The proportion of patients eligible for reperfusion who received reperfusion therapy increased from 93.8% to 96.7%; rates of fibrinolysis decreased from 13.4% to 7%; times to reperfusion decreased; and there was a relative reduction in the adjusted odds of in-hospital mortality of 25%. These findings are to be

celebrated, suggesting that Mission: Lifeline has significantly aided patients and healthcare providers alike in the treatment of STEMI.

Unfortunately, there is an elephant lurking in the room. Or perhaps more accurately, the elephant has been excluded: patients with cardiac arrest. The reported improvements in mortality were demonstrated only after excluding patients presenting with cardiac arrest. This exclusion does not diminish the importance or potential of the Mission: Lifeline program and its effects on STEMI care. It does, however, serve to highlight an important patient population with exceedingly high mortality and our limited understanding of how best to intervene to improve their outcomes.

Cardiac arrest represents an increasing proportion of patients presenting for primary percutaneous coronary intervention in the United States. Reasons for this trend are unknown. The increasing burden of comorbidities among patients being treated in catheterization laboratories<sup>2</sup> suggests that it may be, in part, related to an increased willingness of providers to offer patients with poor prognoses an opportunity for revascularization. Despite increasingly aggressive approaches to revascularization, outcomes remain poor for these patients, with up to 50% mortality.<sup>3</sup> These poor outcomes are demonstrated in the present analysis as well. Excluding postarrest patients, there was a reduction in mortality for patients with STEMI. However, when these patients were included in the analysis, this reduction was eliminated, highlighting the magnitude with which the patients experiencing cardiac arrest influence the overall population outcomes.

The challenge going forward is to see if we can apply the lessons learned from Mission: Lifeline to improve cardiac arrest care. The effectiveness of the Mission: Lifeline program stems from the science underpinning its efforts and the coordinated efforts, sponsorship, and incentives promoting its adoption. Decades of research defining quality metrics and targets for intervention in STEMI care resulted in a set of well-defined metrics and goals that are both measurable and attainable.<sup>4</sup> An expansive program tied to national cardiac registries, with support and funding from the American Heart Association, Mission: Lifeline is well supported. These relationships with registries and professional organizations provided significant and coordinated sponsorship for the

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program in its infancy and supported its growth. Finally, the public reporting of quality measures for STEMI care also provides additional incentive for national organizations and regional facilities to participate in programs to optimize these metrics. Taken together, these factors led to the development of the organized and systematic protocols and frameworks of Mission: Lifeline.

What are the barriers to creating parallel efforts for patients with cardiac arrest? Current guideline recommendations for patients with cardiac arrest and postresuscitation ST elevations on ECG are limited but exist. They call for targeted temperature management as soon as possible and immediate angiography and percutaneous coronary intervention when indicated.<sup>4</sup> These guidelines have been supported and codified by recently published performance and quality measures for acute myocardial infarction.<sup>5</sup> However, even these recommendations are debated among practitioners and are challenging to measure. Readily identifiable, measurable, and achievable goals for postarrest care in STEMI are not yet established, and they require further and more comprehensive evaluation of both therapies and processes of care. Preliminary and ongoing studies are evaluating potential strategies and metrics for postarrest care, ranging from prehospital targeted temperature management<sup>6</sup> to direct transport of patients with arrest to percutaneous coronary intervention–capable hospitals.<sup>7</sup> These studies carry promise, but much work remains to be done. Standards of care and measurable quality metrics are needed for cardiac arrest, like those that have been established for STEMI. Perhaps existing quality improvement networks like Mission: Lifeline can be leveraged to help identify these standards and metrics. Expanding data collection or specifying specific elements for patients with cardiac arrest within existing or emerging registries may help identify opportunities to improve care. These registries can be vehicles to surveil postarrest processes of care and outcomes. Finally, national societies and organizations should promote and prioritize cardiac arrest care. Inclusion of emergent angiography and targeted temperature management for patients with cardiac arrest in professional society-sponsored performance and quality metrics are promising steps.<sup>5</sup> Similar to what was seen for STEMI with Mission: Lifeline, further such sponsorship would help to sustain efforts to improve postarrest care.

The authors should be congratulated on this analysis, which demonstrates a clear relationship between the initiation of the Mission: Lifeline program and improvements in STEMI care. With appropriate goals, incentives, and the necessary resources and support, these systematic and broad-reaching quality improvement programs can be successful in their goals to optimize care. With an effective model already

deployed for STEMI, an opportunity exists to follow this blueprint for cardiac arrest. Unfortunately, many of the key pieces that made Mission: Lifeline successful for STEMI are not yet in place for cardiac arrest, limited first and foremost by inadequate characterization of these patients and their care. Many people reasonably and justly argue that including postarrest patients in any evaluation of STEMI care is not appropriate, and so postarrest patients are often excluded from analyses. However, not analyzing patients with cardiac arrest at all carries its own cost in lost opportunities to learn about these patients.

Out-of-hospital cardiac arrest is an elephant in the room that is too commonly ignored and excluded. It is time to stop excluding the elephant in the room, and instead earnestly define metrics and best practices to improve the care for these patients.

## Disclosures

None.

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