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TURNING SCIENCE INTO ACTION

Improving Care of STEMI in the United States 2008 to 2012: A Report From the American Heart Association Mission: Lifeline Program

The following is a synopsis of "Improving Care of STEMI in the United States 2008 to 2012: A Report From the American Heart Association Mission: Lifeline Program," published in the January 8, 2019, issue of the *Journal of the American Heart Association*.

What is already known on this topic?

Within integrated regional systems of care, prompt reperfusion (restoration of blood flow to the heart) in response to a ST-segment–¬elevation myocardial infarction (STEMI, a type of heart attack) can reduce the size of the infarction and the incidence of mortality. Increased use of electrocardiograms (ECGs) at first medical contact (FMC) in patients exhibiting symptoms of STEMI, rapid and direct transport to percutaneous coronary intervention (PCI, or heart stent)–capable hospitals, and administration of fibrinolytic therapy (blood clot solvents) can all contribute to better patient outcomes. In fact, the American College of Cardiology Foundation/American Heart Association (ACCF/AHA) 2013 guidelines for managing STEMI recommend that "all communities should create and maintain a regional system of STEMI care that includes assessment and continuous quality improvement of emergency medical services (EMS) and hospital-based activities."

Mission: Lifeline, "one of the largest quality improvement efforts in STEMI ever attempted," is a voluntary AHA-led program for hospitals that began in 2008. The program's objectives align with the ACCF/AHA guidelines, which include use of a 12-lead ECG by EMS at FMC; EMS transport to a PCI-capable hospital, with an FMC-to-device time goal of 90 minutes or less, or transfer from a non–PCI-capable hospital to a PCI-capable hospital, with an FMC-to-device time goal of 120 minutes or less; and fibrinolytic therapy for patients whose FMC-to-device time is predicted to exceed 120 minutes due to "unavoidable delays." Mission: Lifeline's products and activities include protocols for EMS and hospital coordination of care, monthly meetings of interdisciplinary teams, and regular webinars. Data for the program are collected from the National Cardiovascular Data Registry ACTION-GTWG (Acute Coronary Treatment and Intervention Outcomes Network Registry—Get With The Guidelines). These data are used to provide reports to hospitals and regional systems of care, allowing them to assess their performance and improve the quality of STEMI-related care.

What is added by this article?

From 2008 to 2012, the authors collected ACTION-GWTG data on 147,466 patients admitted for STEMI at 485 Mission: Lifeline hospitals across 46 states, representing 656 systems of care. Over the 5-year period, there was a 26% increase in the use of prehospital ECGs. Two-thirds of the patients were brought directly to PCI-capable hospitals, either through EMS or by a private vehicle. Nearly all of the remaining patients initially brought to non–PCI-capable hospitals were transferred to PCI-capable hospitals, and the time to transfer dropped from 130 to 112 minutes. Moreover, FMC-to-device times fell significantly for patients brought directly to PCI-capable hospitals by EMS, from 93 to 84 minutes.

Reperfusion strategy trends also changed in a positive direction, with the total proportion of patients not treated with any kind of reperfusion therapy falling from 6.2% to 3.3%. The proportion of patients who arrived at PCI-capable hospitals and received primary PCI treatment rose from 93% to 98%. There was also a 28% increase in primary PCI transfers. However, the use of fibrinolytic therapy fell, dropping from 13.4% to 7.0%.

Most significantly, when controlling for cardiac arrest and other baseline measures, the authors found that mortality steadily decreased over the 5-year period, from 5.3% to 3.7%, resulting in a 14% relative risk reduction in mortality. Although the findings did indicate an increase in *crude* cardiac arrest rates and mortality, this was attributed to an increase in the number of high-risk patients in the study population.

What are the implications of these findings?

System level–focused STEMI care improvement programs such as Mission: Lifeline can help improve patient quality of care. These findings emphasize that swift use of ECGs in prehospital care on patients exhibiting STEMI symptoms results in quicker time to reperfusion treatment. Unfortunately, high-risk patients, such as those with cardiac arrest, face delays in receiving PCI. Therefore, the authors suggest improvement in system-level care for *out-of-hospital* cardiac arrest.

Resources

1. American Heart Association: Mission Lifeline
2. Centers for Disease Control and Prevention: Heart Attack Signs and Symptoms
3. American Heart Association: Treatment of a Heart Attack

References

O'Gara PT, Kushner FG, Ascheim DD, et al. 2013 ACCF/AHA Guideline for the Management of ST-Elevation Myocardial Infarction. A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. 2013;61(4):e78-e140.

Citation

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