

Using Technology to Transform STEMI Care

BACKGROUND

Coronary heart disease accounts for 1 in 7 deaths in the US, killing more than 366,800 people annually. Research shows that contact-to-treatment times directly impact outcomes for patients with ST-Elevation Myocardial Infarction (STEMI); American Heart Association (AHA) Guidelines for STEMI recommend First Medical Contact (FMC)-to-device time be less than 90 minutes.

Treating patients with STEMI is a complicated process that crosses multiple departments. With so many people involved in the continuum of care many opportunities for miscommunication and delay can occur. There is great potential for technology to help improve STEMI care.

PROJECT AIM

The objective of the project was to meet the AHA Guidelines for improving care for STEMI patients by reducing FMC-to-device time to under 90 minutes. Additional guidelines were evaluated for implementation, including activating pre-hospital notification for STEMI and working with multiple organizations to create a regional system of care.

PROJECT DESIGN/STRATEGY

As part of a Yale research study called Leadership Saves Lives, an interdisciplinary team was formed consisting of executive hospital leadership, Heart & Vascular physician champions, hospital department representatives, Fire Chiefs and Paramedics. The team implemented a digital platform, Pulsara, to connect all members of the care continuum during STEMI care.

The project began with a pilot with one hospital and eight local EMS systems for six months and was then expanded to include 31 Fire and EMS systems across a seven county region in Northern Kentucky.

CHANGES MADE

- Implemented best practices for both hospital and pre-hospital organizations to inspire behavior modification based on the results of pilot.
- Installed digital acute care coordination solution throughout St. Elizabeth Healthcare and with 31 Fire and EMS agencies who provide pre-hospital care in Northern Kentucky.
- Activated pre-hospital notification for STEMI patients and providing diagnostic images and brief clinical picture – more information sharing than ever before.
- Communicated with all departments simultaneously – ED, cath lab, cardiology, etc. as well as with all pre-hospital care team members.
- Minimized use of alpha-numeric pagers. These have slowly disappeared and become less relevant in time-sensitive emergencies.
- Streamlined significant workflow and process changes for EMS, ED, patient logistics transfer center and cath lab staff. For example, with pre-hospital notification, cath lab crews arrive at the same time as the patient after normal operating hours.
- Increased collaboration with EMS to meet and improve upon established STEMI metrics.



SUMMARY OF EMS RESULTS/OUTCOMES

After implementation, average FMC-to-balloon time decreased to 84 minutes, meeting and exceeding the established 90-minute AHA standard for FMC-to-balloon times. This is a 17% reduction from our pre-implementation average. Before implementation, only 54% of FMC-to-balloon times were less than 90 minutes; after implementation that number has increased to 69% of cases meeting the AHA standard.

We were meeting the door-to-balloon (D2B) metrics before implementation, but have since been able to reduce the time a patient stays in the emergency department and save nearly 17 minutes compared to the historical D2B average (69 minutes vs. 52 minutes). Before implementation, only 78% of D2B times were less than 90 minutes; after implementation that number has increased to 98%.

We have also noticed that variability has been reduced by tracking standard deviations since 2016. We can quantify and monitor variation across these cases. We have found that with the higher number of cases meeting the 90-minute standard, our data points are becoming less spread out. This speaks to maturation of the new process and therefore improving consistency.

First Medical Contact to Treatment Times

14%

The number of cases successfully completed below the 90-minute goal.

16%

The average decrease in treatment time.

Door-to-Balloon Treatment Times

19%

The number of cases successfully completed below the 90-minute goal.

24%

The average decrease in treatment time.

NEXT STEPS



Expand the use of Pulsara to all patient types to improve every aspect of care delivery and operations. The goal will be to regionalize this established best practice and apply it to other time-sensitive emergencies. We will measure the impact in other time-sensitive emergencies to ensure effectiveness, and will implement best practices for each.

Time and resource utilization can be improved, allowing more people to spend time on actual patient interactions. We strive to be a more efficient workforce, making smarter patient-centric decisions. We are better able to accomplish that objective by using this digital acute care coordination tool.