

## Using CARES Data to Influence Survivability in the Hospital Setting

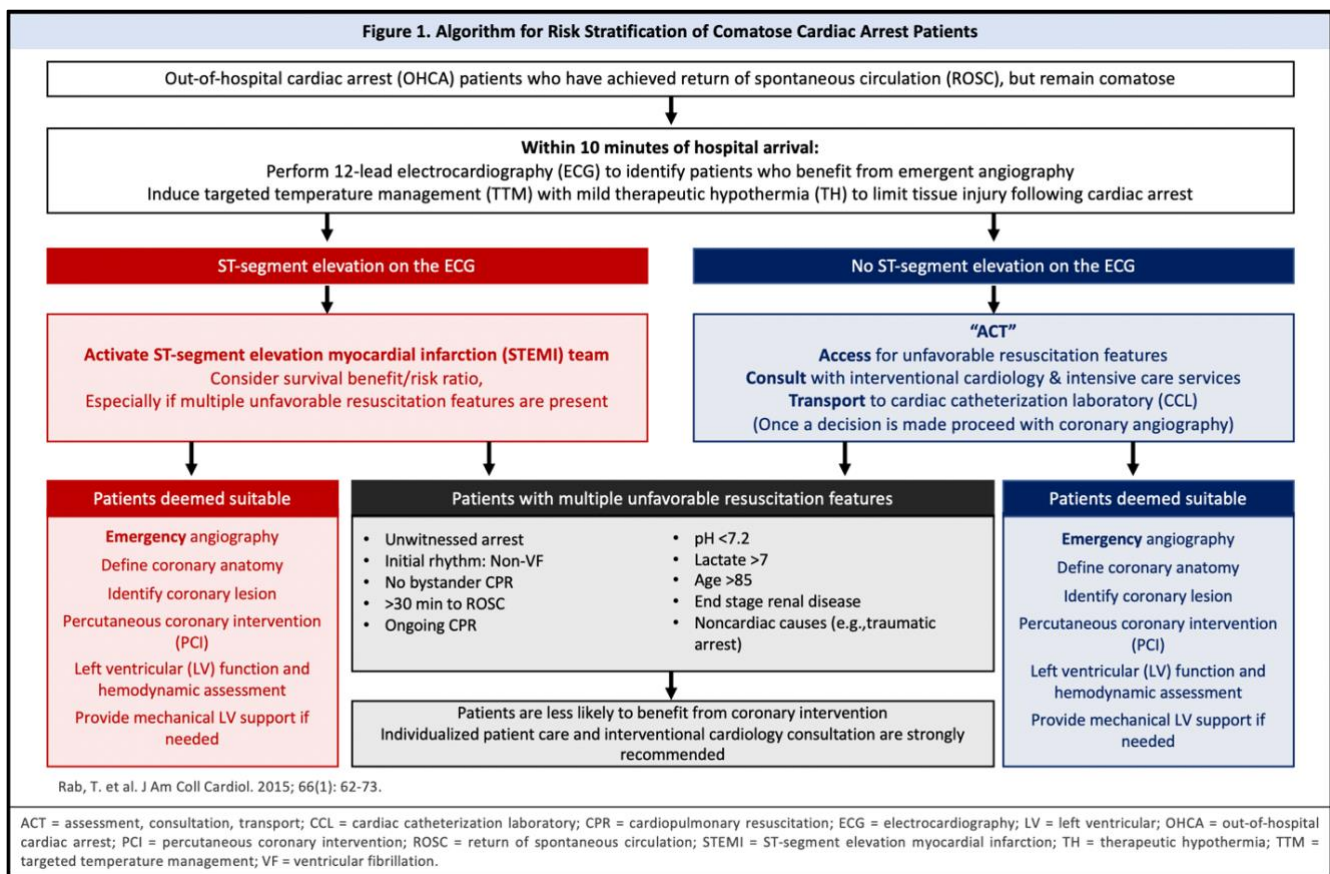
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In early 2018, the finalized 2017 CARES National Reports were made available to individual EMS and hospital facilities. It was a time of discovery for the Metro Health-University of Michigan Health organization as survivability following an out-of-hospital cardiac arrest (OHCA) was not a subset of patients that had specifically been tracked.

One metric that stood out was in-hospital mortality. This represents patients who experienced an OHCA, survived to hospital admission, but do not survive to discharge. At the time the data was first presented, the organization was faring worse than state and national averages at a 70% in-hospital mortality rate, while the state average was 66.4% and national average was 62.8%.

It quickly drew the attention of the organization's leadership and interdisciplinary Chest Pain Committee. What we understood, without the ability to control, was the fact that our hospital remains the most rural of the three major health systems in our region (Grand Rapids area). Metro Health regionally serves a large span of rural West Michigan around Grand Rapids. Often, our cardiac arrest patients had longer distances in transport, adding precious minutes to a critical situation. However, there were other factors that Metro had control over, one of those being Emergency Department (ED) disposition. There was no identifiable or standardized decision-making process as to where the patient should go following their care in the ED. Often times, patients went emergently to the Cardiovascular Catheterization Lab (CCL) and other times to the Intensive Care Unit (ICU). This was subjectively determined by individual physicians, case-by-case.

An article published in the Journal of the American College of Cardiology (JACC) in 2015<sup>1</sup> offered an algorithm to provide guidance for the management of patients who have achieved return of spontaneous circulation (ROSC), but remain comatose. ST-elevation on a 12-lead electrocardiogram was a direct indication for emergent transfer to CCL. CCL versus ICU disposition should be based on a number of considerations as shown in the figure below.



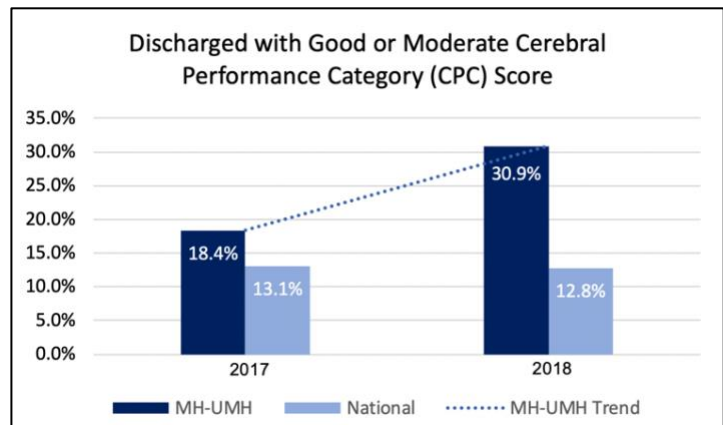
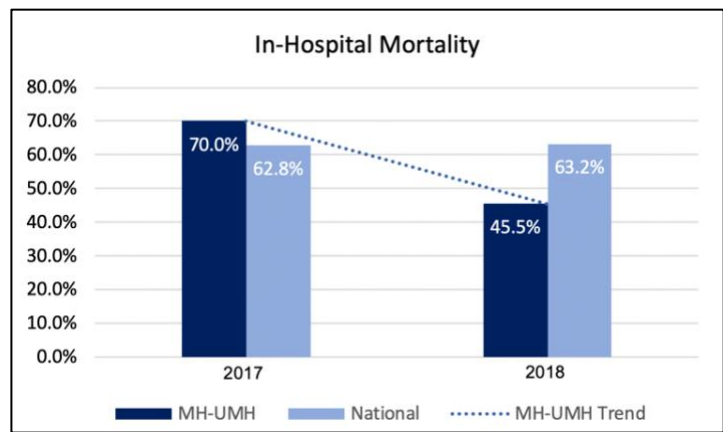
<sup>1</sup> Rab, T, Kern KB, Tamis-Holland JE, et al. Cardiac arrest: a treatment algorithm for emergent invasive cardiac procedures in the resuscitated comatose patient. *J Am Coll Cardio* 2015;66:62-73 (Figure 1 reproduced with permission)

Our Chest Pain Committee, which is comprised of pre-hospital and hospital/departmental senior leaders, physician champions, and front-line staff, all supported the adoption of a standardized care model and it was accepted into practice almost immediately. Shifting to an increased focus on metabolic stabilization following cardiac arrest directly correlated to a higher percentage of OHCA patients transferred to ICU rather than to CCL for diagnostic cardiac angiography. Often times this delayed, but not eliminated, a heart catheterization to explore potential causes for the arrest. Targeted-temperature management remained a priority as well for eligible patients, as it had been prior to implementation.

To assess compliance with this care pathway, every admitted OHCA patient was tracked and evaluated quarterly by our interdisciplinary team for appropriate disposition. Any outliers were referred to and discussed by a peer review committee. When 2018 finalized data became available, a drastic improvement was seen in reduction of in-hospital mortality for our OHCA patient population as tracked by CARES. A previous 70% mortality rate had fallen to approximately 45%. Furthermore, the number of patients discharged with a Cerebral Performance Category (CPC) Score of 1 or 2 had also risen from 18.4% to 30.9%, indicating that more people who survived remained neurologically intact.

Success of this project is credited to the engagement and actions of a multi-disciplinary team that spans the full spectrum of representation including EMS, ED, CCL, ICU and beyond. Utilization of a pathway supported standardization of care and minimized deviation between providers and specialties adding consistency to how we treated our patients, and ultimately was associated with a decrease in in-hospital mortality. A thorough review and feedback process ensured accountability and helped to drastically reshape and simplify the decision-making process for continued treatment of the OHCA patient.

As a result, more patients are returning to their families with optimal neurological functioning.



*Metro Health – University of Michigan Health is an integrated healthcare system located in Wyoming, Michigan that includes a 208-bed general acute-care osteopathic teaching hospital. Metro Health Hospital is a primary PCI center with a fully staffed CCL 24/7 and nationally recognized heart and vascular services. Other hospital certifications include Level 2 Trauma and Comprehensive Stroke care.*