

## FAILURE TO RESCUE SAFER TEAM ACTS TO REDUCE MORTALITY RATES AFTER CARDIAC ARREST



**Christine Bielick Kotkowski, MD**

Division of Pulmonary, Allergy and Critical Care Medicine

Division Chief, Internal Medicine-Pediatrics

Medical Director for Respiratory Therapy, Resuscitation, Adult Cystic Fibrosis programs

UMass Memorial Medical Center

In-hospital cardiac arrests are stressful, high-stakes events that require interdisciplinary teamwork and communication. Even with optimal use of the advanced cardiovascular life support (ACLS) algorithm – which simplifies the process for the management and treatment of patients experiencing or progressing toward a cardiovascular emergency – survival remains around 25%.

To help reduce mortality rates, the Resuscitation Committee and the SAFER team dedicated to FTR (the Failure To Rescue quality measure) have together completed a number of foundational actions:

- Restructured code team composition to ensure a consistent response to codes, with the right number of caregivers with training and skills encompassing the needs for successful implementation of ACLS algorithms.
  - Utilized innovation grant funding to establish a debriefing training course in partnership with the interprofessional Center for Experiential Learning and Simulation at UMass Chan Medical School; to date, 39 participants have been trained.
  - Initiated interdisciplinary cardiac arrest simulations, also known as mock codes, at University and Memorial campuses, with participation from resident, Nursing, Respiratory Therapy and Pharmacy teams.
- Provided education and training on metronome use during CPR, which can help caregivers achieve a targeted compression rate.
  - Created a clear data set on patient mortality, helping to drive improvement and sustainment efforts.

These achievements are underscored by our teams' ongoing efforts to track and encourage regular debriefing after code events and increase our use of data to identify areas for improvement and track our progress.

Building on this progress, our teams have been working towards the following goals for fiscal year 2023:

1. Expand interdisciplinary mock codes to include APPs and begin in-situ simulation, particularly related to uncommonly accessed areas, such as the echocardiography lab.
2. Begin education and training on use of end tidal CO<sub>2</sub> during codes to monitor CPR quality. (ETCO<sub>2</sub> levels reflect how well CO<sub>2</sub> is carried in the blood to the lungs and exhaled.)
3. Create a framework for feedback utilizing CPR data from defibrillators at University Campus, identify areas for improvement and correlate with survival data.
4. Expand use of new procedure notes to ensure an accurate data set that easily captures all in-hospital cardiac arrests.

### **IMPROVING CPR QUALITY THROUGH DATA COLLECTION**

With the installation of upgraded defibrillators on the University Campus in 2023, we can now use data to identify areas for improvement in CPR quality. The new devices transmit data on compression rate, compression fraction and shock data, and also have a built-in metronome.

The Resuscitation Committee and FTR SAFER teams collaborated with a resident-led group to obtain data on baseline compression rates during codes – and thus discovered an area for potential improvement. The rate was well above the 100 to 120/min, which may reduce coronary blood flow and decrease the percentage of compressions that achieve target depth. Our teams created an educational plan with our nursing educator and simulation leaders, and metronome usage was demonstrated and encouraged. We have since tracked compression rate data for several months and seen demonstrated improvement in compression rate.

We hope to use our data set to improve chest compression fraction and end tidal CO<sub>2</sub> data to monitor the patient's physiologic response to CPR. Additionally, we are working with Risk Management, unit leaders and educators on the best way to provide performance feedback to improve future event execution.

The Resuscitation Committee and FTR SAFER teams also recently collaborated with colleagues in the Emergency Department, where many of our in-hospital cardiac arrests occur (arrest after 10 minutes of arrival). In the past, data collection from codes in the ED have been difficult to track due to differing documentation types. Now, with the full adoption of the new procedure note in the ED, we have a comprehensive data set that can easily be tied to outcomes and provide us a better sense of how our mortality may track based upon cardiac rhythm. This can then help identify areas for improvement in the future. We are optimistic we will move this note into other hospital areas soon.

The FTR SAFER Team and Resuscitation Committee are dedicated to ongoing work to improve survival for our patients who suffer in-hospital cardiac arrest. While we consistently remain above the national average for survival after in-house cardiac arrest, we have seen a sustained increase in this number over the past quarter. We will continue to measure our outcomes to ensure we sustain our success and drive further improvement.

