Cardiac Arrest in the Intensive Care Unit: Opportunities for Improvement

Ari Moskowitz, MD; Katherine Berg, MD; Anne Grossestreuer PhD; Michael N. Cocchi, MD; Jennifer Sarge, RN; Donna Williams RN MS; Sharon C O'Donoghue, RN DNP; Todd Sarge, MD; Jesse Yang, MD; Maureen Chase, MD MPH; Michael W. Donnino, MD

Introduction/Problem

Cardiac arrest in the ICU

➢ Uncommon but carries high morbidity/mortality
➢ Often thought to be the inevitable result of critical illness
➢ Patients in the ICU closely monitored
  - Low nurse-to-patient ratios
  - Continuous cardiopulmonary monitoring
  - Close proximity of the physician team

Aim/Goal

➢ To assess the incidence & causes of preventable ICU arrest
➢ To create a data-driven tool to reduce ICU arrest frequency

Interventions

➢ ICU arrests 8/2017-5/2018 prospectively identified
➢ All arrests reviewed by expert panel to assess degree of preventability and identify opportunities for improvement
➢ Arrests reviewed by experts individually then discussed
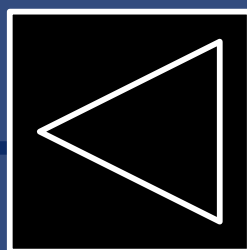➢ Real-time surveys sent to clinical team (MD/RNs)

Interventions

➢ Experts and survey respondents rated each arrest on a scale from **0 (not preventable)** to **5 (completely preventable had different action been taken in the ICU)**
➢ Arrests considered 'likely preventable' if rated 3 or higher by at least 50% of reviewers

Results/Progress to Date

	Complete Cohort (n=43)	Likely Preventable* (n=11)	Unlikely or Not Preventable (n=32)	P-Value
Age (Median, IQR)	69.0 (58-77)	69.0 (60-78)	69 (58-77)	0.66
Gender (%Female)	34.9	9.1	43.8	0.07
Race (%White)	51.2	54.6	50.0	>0.99
Location (%)				
MICU	41.9	45.5	40.6	
CCU	23.3	18.2	25.0	
SICU	18.6	18.2	6.3	
Other ICU	16.2	18.1	29.1	
ROSC (%)	62.8	54.6	65.6	0.72
Survival (%)	23.3	36.4	18.8	0.25

For more information, contact:

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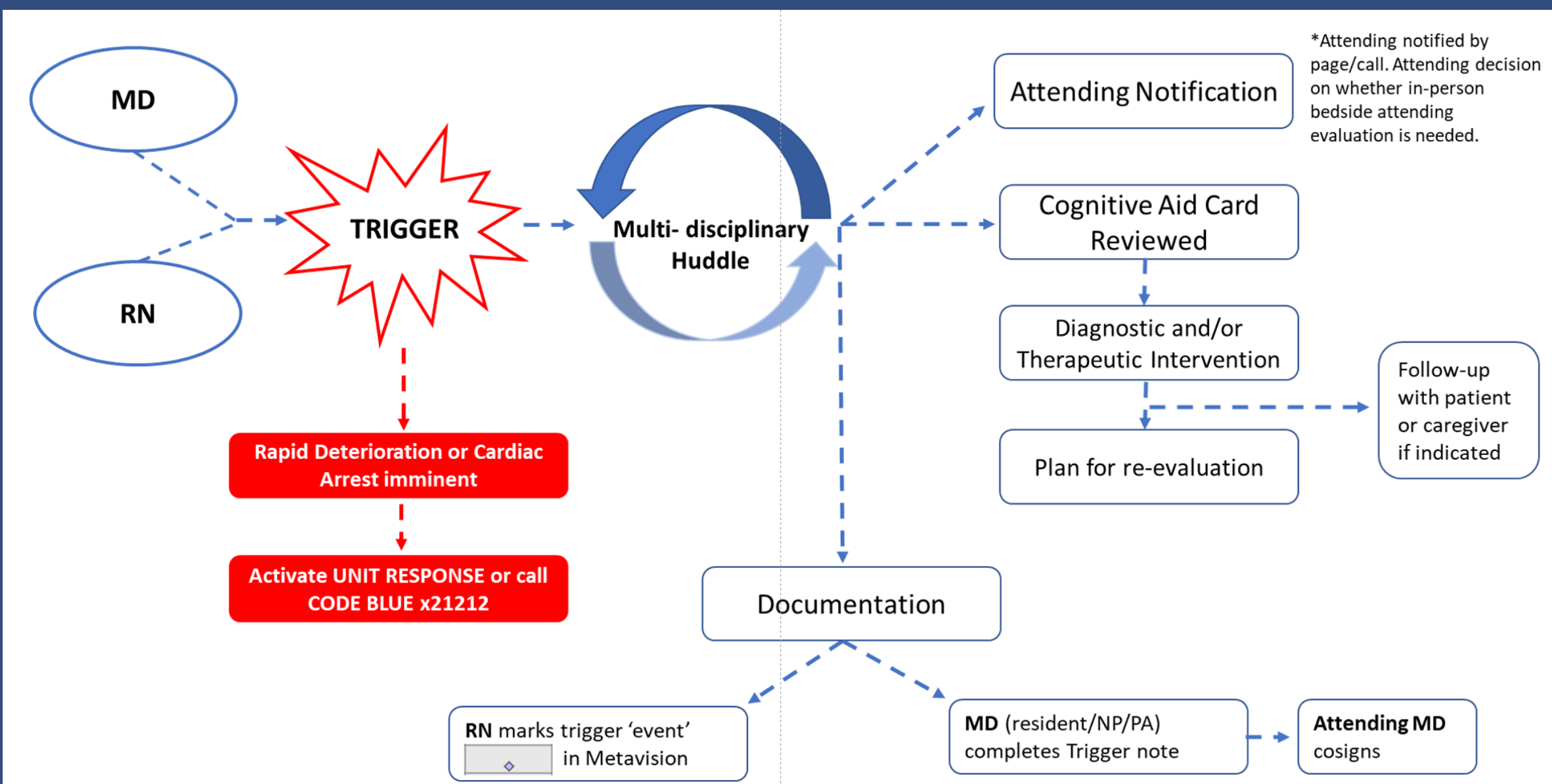
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More Results/Progress to Date
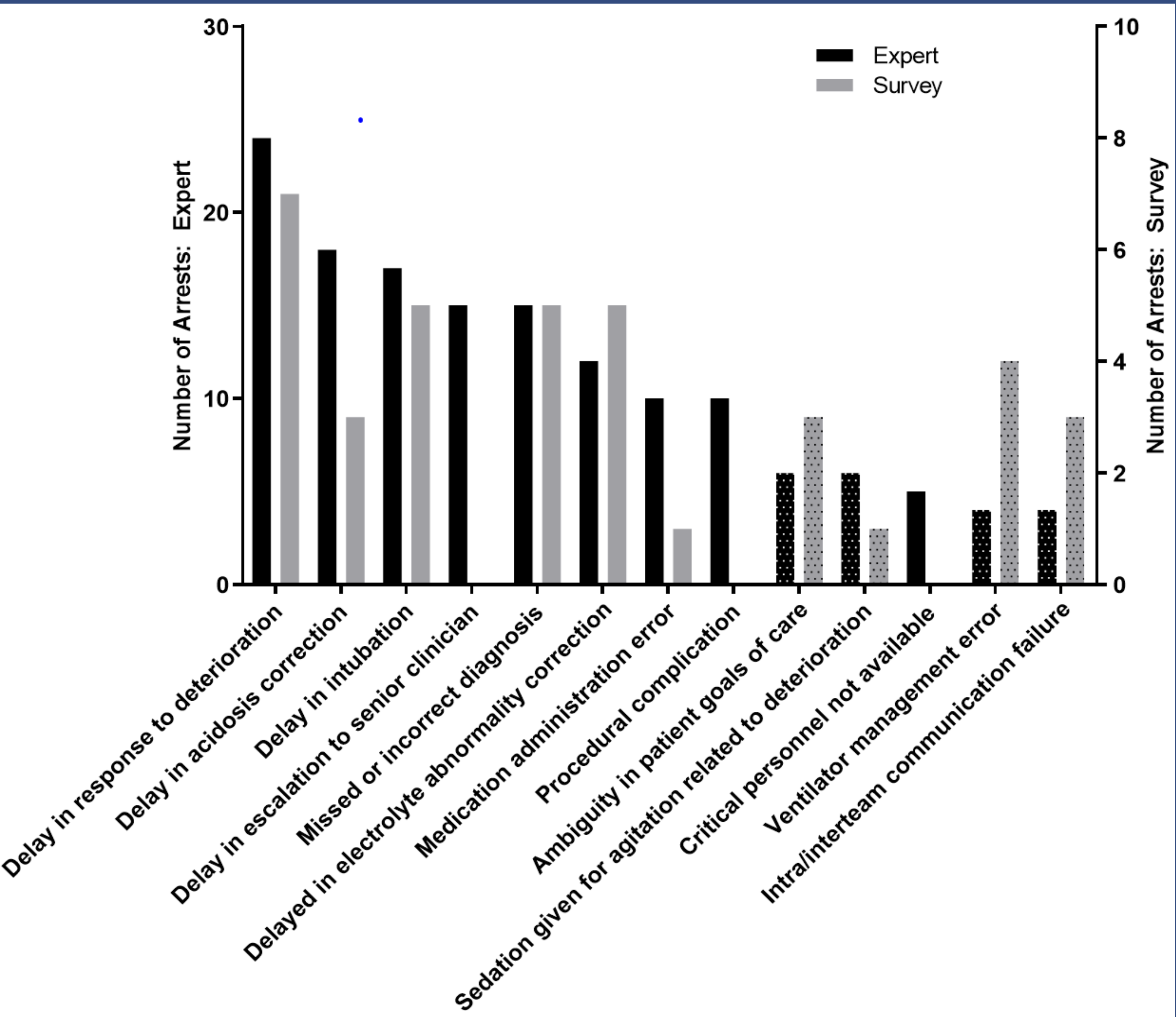
The number of arrests in which at least one expert review (left Y-axis) or one survey respondent (right Y-axis) identified the **potential** contributor to arrest preventability. Only contributors identified in at least four arrests are included in this graph to allow for readability. Solid color bars represent *a priori* defined contributors and speckled bars represent novel contributors identified during expert review of the cases.

ICU Trigger & Decision Aid tool flow diagram

Lessons Learned & Next Steps

➢ **25% of ICU arrests in this cohort had some opportunities for different or earlier interventions identified after expert review**

➢ There were common themes identified:
  - Response to clinical deterioration
  - Timing of intubation
  - Anxiety/agitation masking underlying clinical worsening

➢ A data-driven trigger and decision aid tool may help prevent some ICU arrests and is presently being tested in BIDMC ICUs

➢ **Limitations:**
  - Experts reviewed cases after the event and were not involved in the care of arrest patients. Important contingencies may have been missed.
  - Agreement amongst reviewers was only moderate, highlighting subjectivity.

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