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An evaluation of the medical management received in the institutional setting during cardiac arrest at a community hospital

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OBJECTIVE

- To evaluate the medical management patients receive in the institutional setting during cardiac arrest compared to the 2019 American Heart Association (AHA) advanced cardiac life support (ACLS) treatment algorithms.

BACKGROUND

- Cardiac arrests are serious events that have a high mortality rate, especially when the event occurs outside the hospital setting.
- The Cardiac Arrest Registry to Enhance Survival (CARES) reported that 74.3 individuals per 100,000 population experienced an out-of-hospital cardiac arrest (OHCA) needing emergency medical services in 2017.¹
 - Survival to hospital discharge after EMS-treated OHCA was 10.4%, and survival with good functional status was 8.2%.
- Location of adult in-hospital cardiac arrests (IHCA) was 54.2% in the ICU, operating room, or ED and 45.8% in noncritical care areas among 26 742 events at 319 hospitals in 2018.²
 - Initial recorded cardiac rhythm was ventricular fibrillation (VF) or ventricular tachycardia (VT) or shockable in 15.3% of adult IHCA.
- Regardless of location of cardiac arrest, the AHA ACLS treatment algorithms are the standard of care for arrest management. Algorithms are specific to the type of arrhythmia leading to the arrest (i.e. pulseless electrical activity (PEA), VF/VT).³
 - Specifics regarding medication dose, route, and timing is outlined in the algorithm. Medications frequently found in the AHA algorithms include epinephrine and amiodarone.
- AHA update the ACLS guidelines every 5 years, with more focused updates more frequently, if indicated.
 - The 2019 update focused on the timing and dosing of vasopressors during cardiopulmonary resuscitation.

METHODS

- This Institutional Review Board (IRB) approved quality improvement project was a retrospective chart review focused on patients with in-hospital or out-of-hospital cardiac arrests that presented to the emergency department from July through December 2019.
- Data extracted from the electronic medical record (EMR) included targeted medication administrations related to treatment algorithms, intubation status, return of spontaneous circulation (ROSC), discharge disposition, cardiac rhythm at time of the event, and pharmacist presence at event.
- Additional data points collected included patient gender and age, location of the event, and defibrillator utilization.
- Outcomes included appropriateness of medication administration related to the presenting cardiac rhythm, percent of patients with ROSC, patient disposition at discharge and pharmacist presence.

RESULTS

Table 1. Patient Demographics

Demographic Value	% of Events	n
Sex		
Male	43	81
Female	57	108
Age (years)		
0-19	3	6
20-39	6	11
40-59	21	40
60-79	52	99
80+	18	33

Figure 1. Location of Event

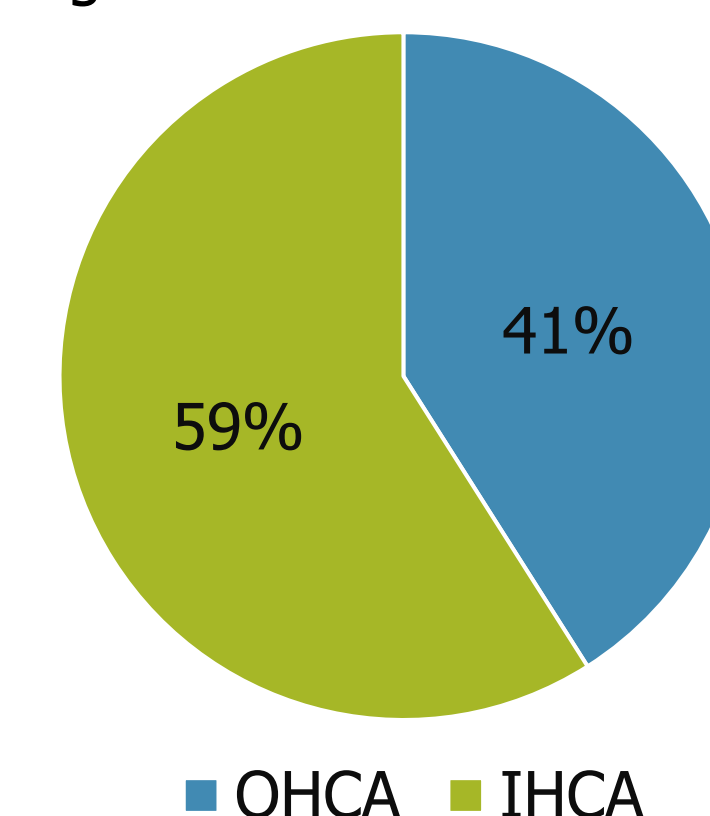


Figure 2. Rhythm at time of Event

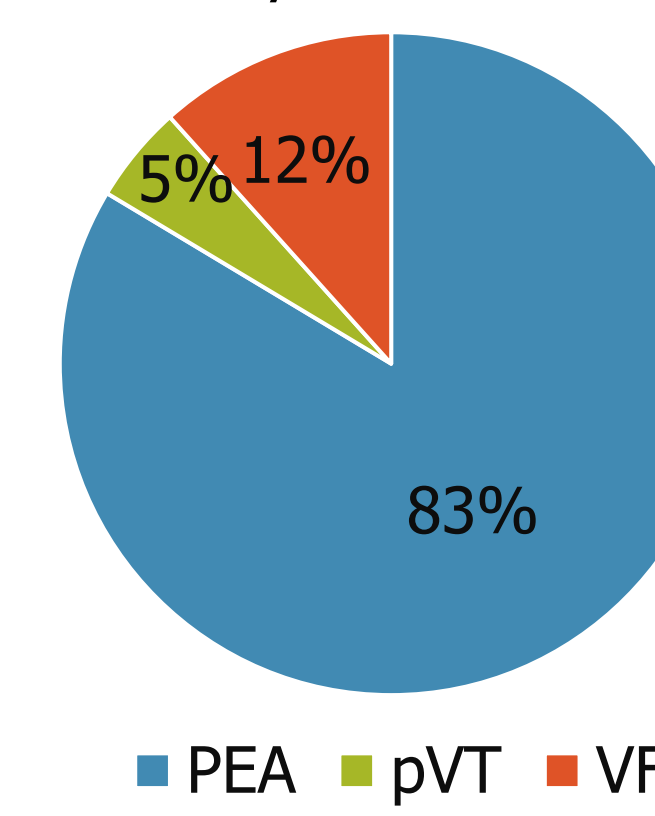


Figure 3. ROSC

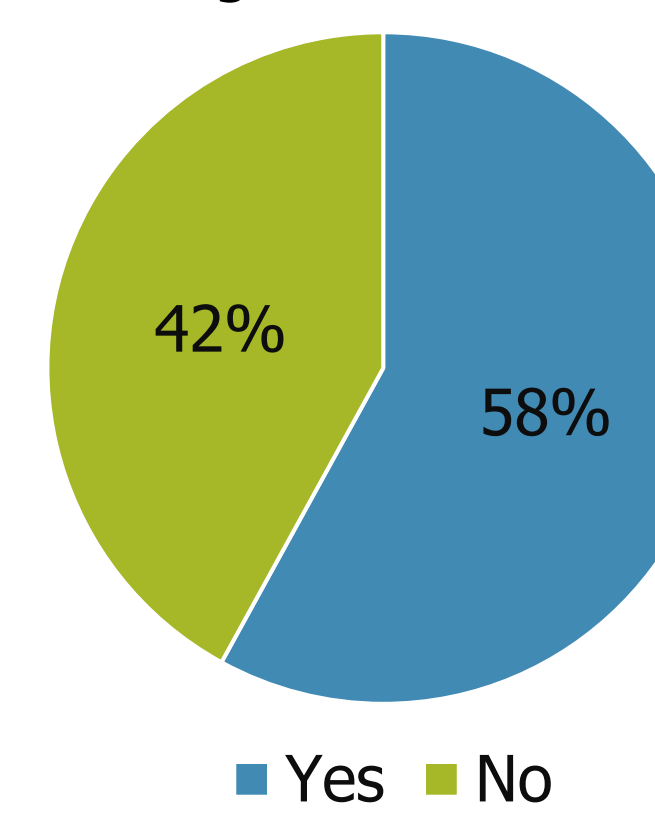


Figure 4. Intubation Status

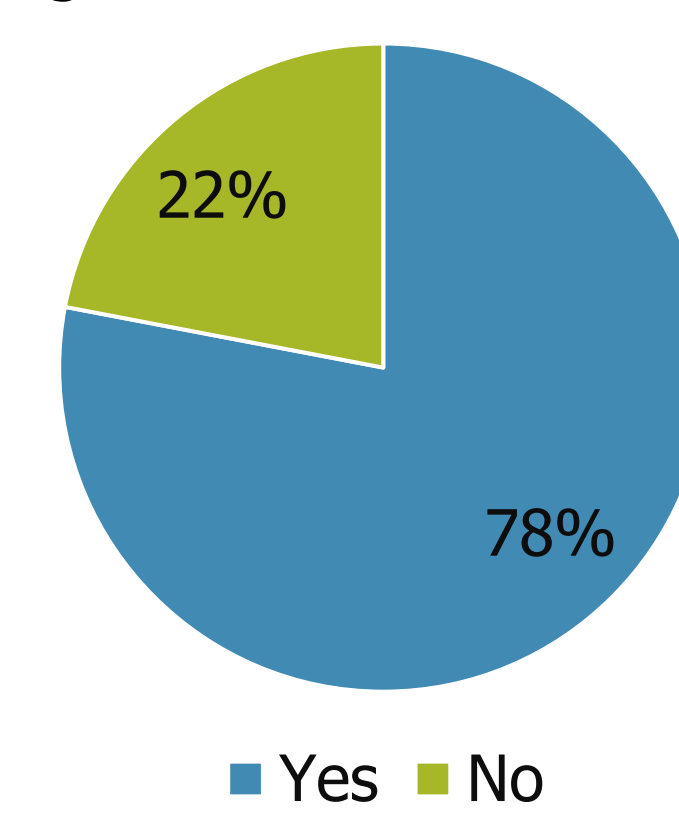


Figure 5. Survival to Discharge

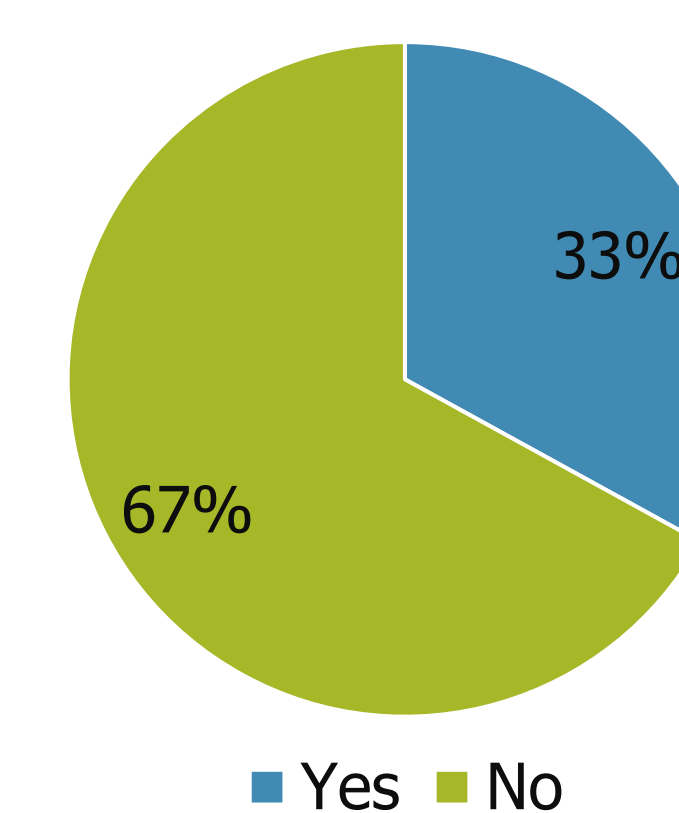
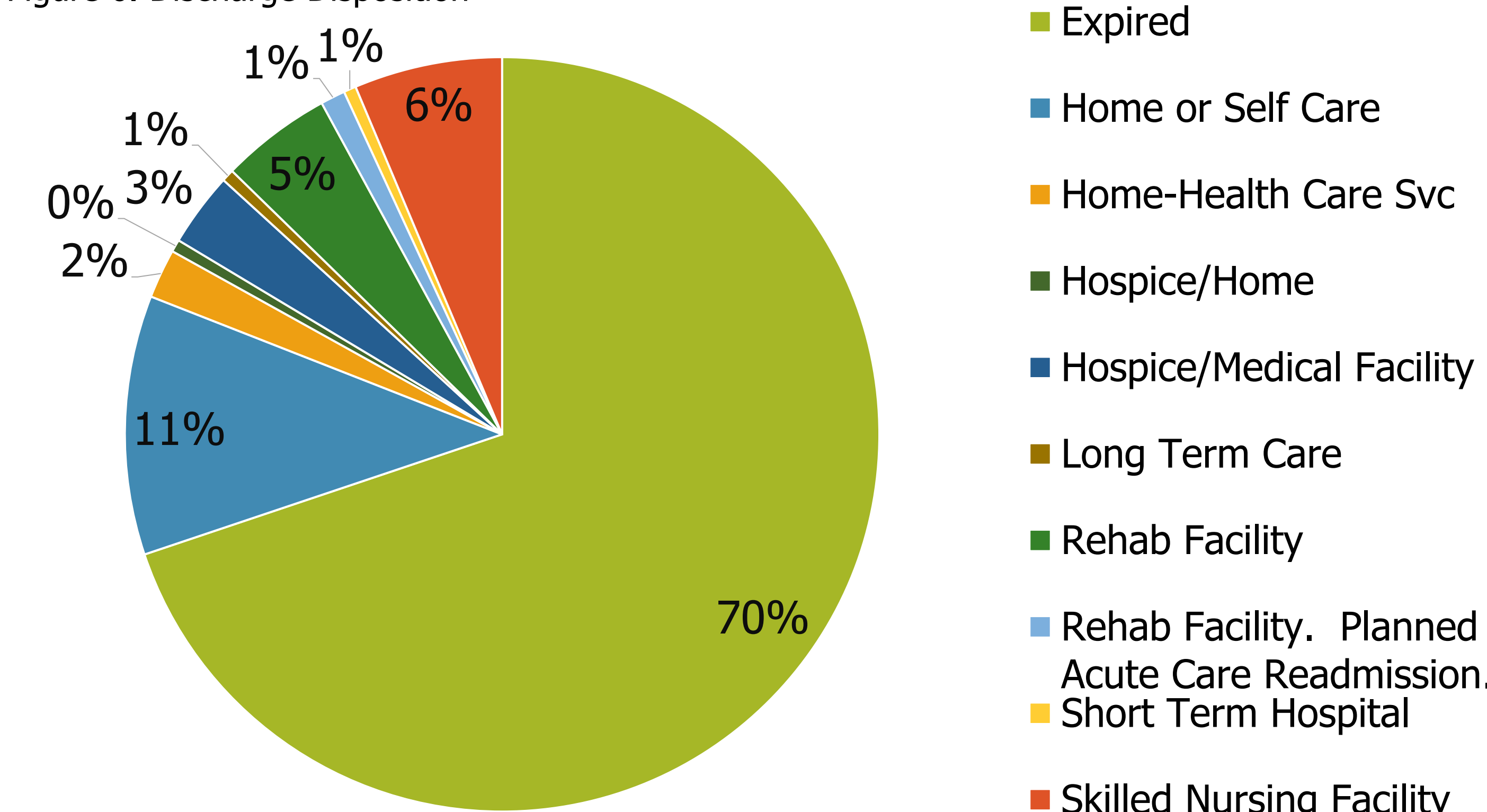


Table 2. Survival to Discharge Details

Survival to Discharge	% of Events
All Event Locations	33%
Emergency Department	28%
ICU/Operating Rooms	35%
Non-Critical Care	25%

Figure 6. Discharge Disposition



RESULTS

Figure 7. Epinephrine Use

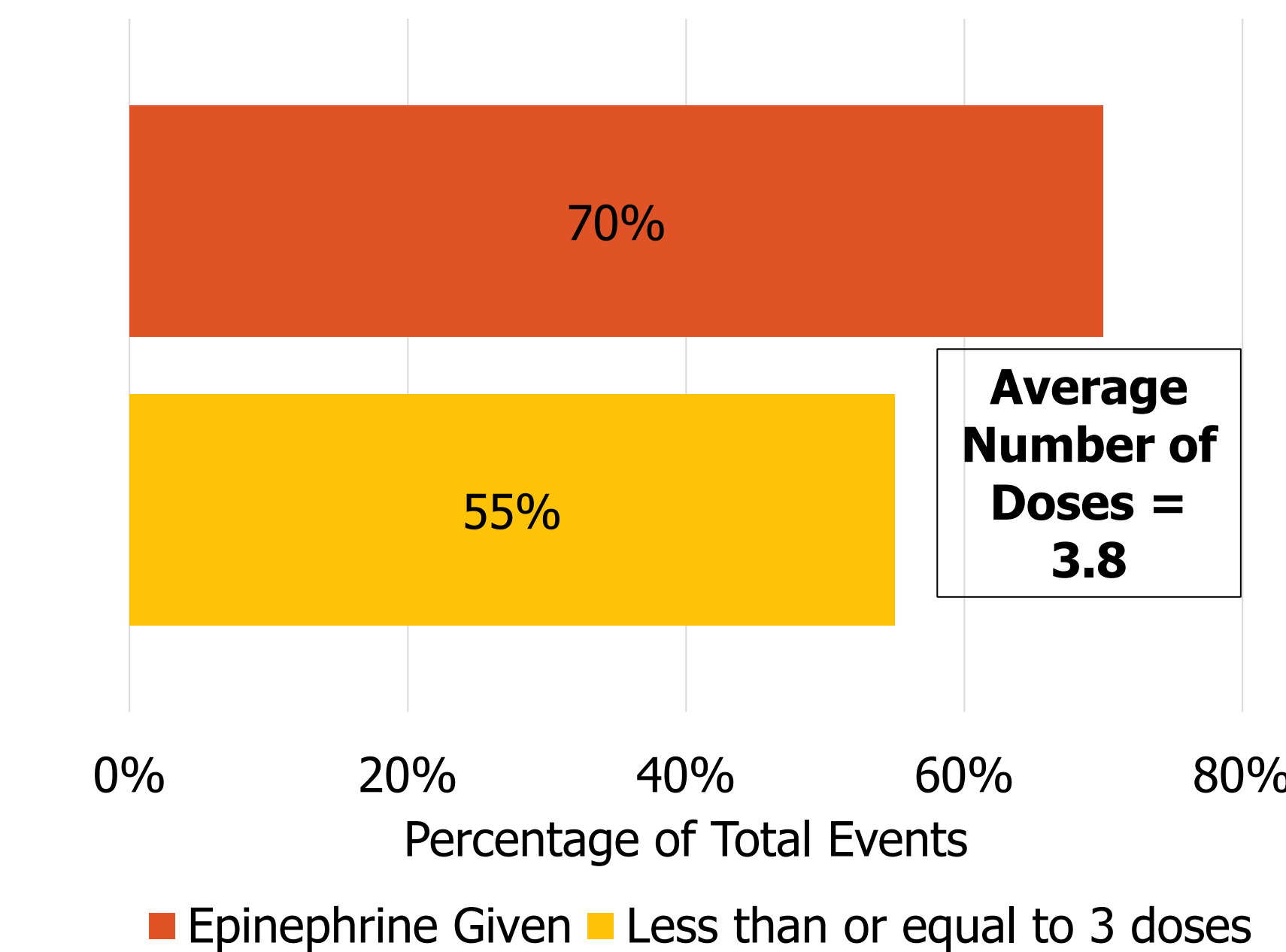
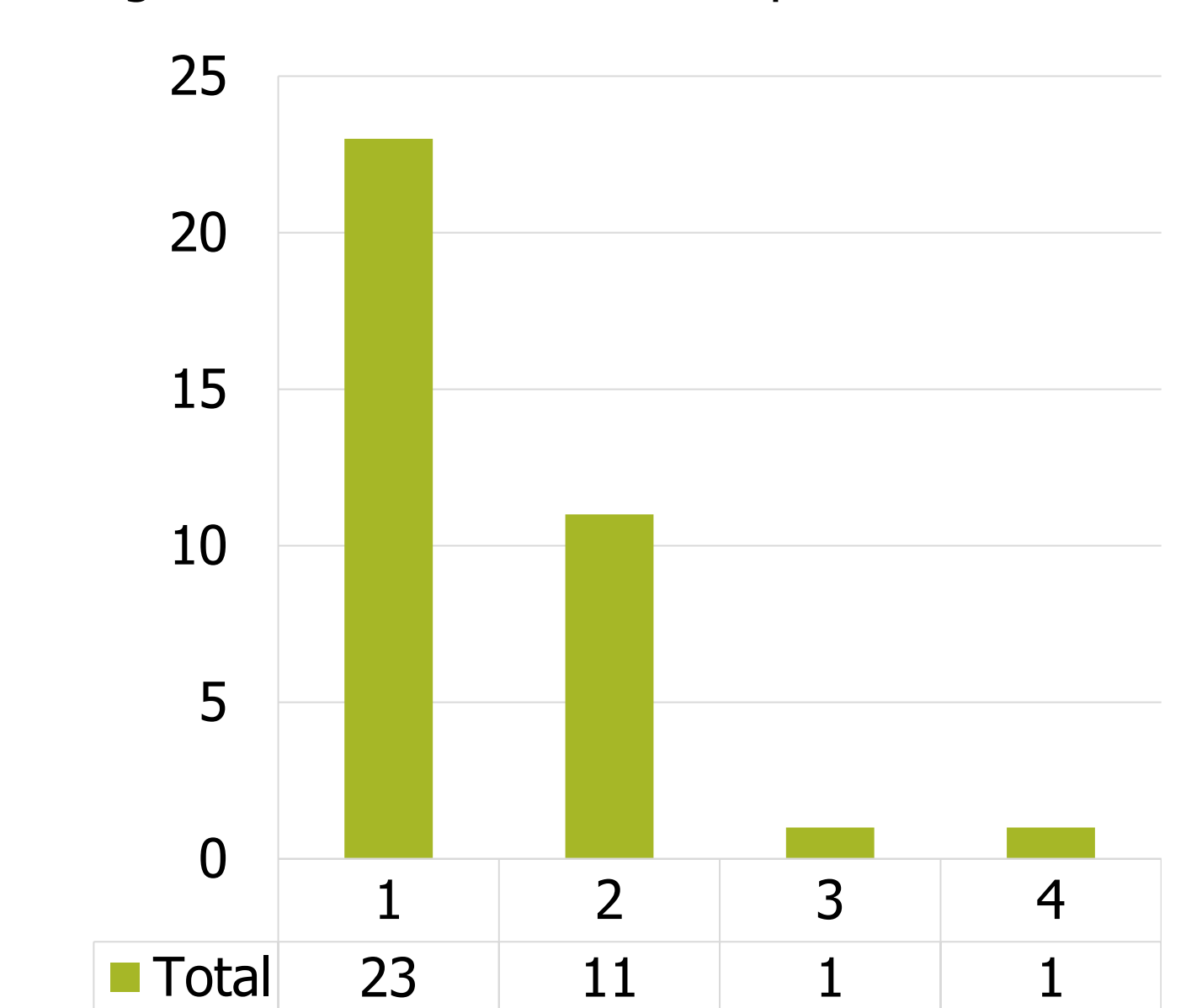


Figure 8. Amiodarone Doses per Event



- Of events when multiple doses were administered, 273/373 (73%) push doses were given within the 3 to 5-minute administration window.
- Amiodarone was administered in 36 (19%) events.
- Hypothermia protocol was initiated for 13% of events with ROSC.
- A pharmacist was present for 16% of total events.

DISCUSSION & CONCLUSIONS

- Survival to discharge after an IHCA or OHCA occurs for approximately 1 in 3 patients.
- The medical management within the institutional setting during cardiac arrest regarding epinephrine administration demonstrated to be appropriate in the majority of events.
 - Opportunity was identified to improve the timing of administrations as outlined in the AHA ACLS guidelines
- Reviewing current AHA ACLS guidelines and re-education of the medical staff could optimize compliance of current treatment algorithms.
- Limitations with this study include the quality of human documented data, as the findings of this study relied upon timely and accurate documentation within the EMR.
 - Data points like pharmacist involvement could be lower than expected due to documentation practice
- A focus on the importance of complete documentation will be a main point in the re-education initiative for the providers, nursing, and pharmacy personnel.

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Disclosure

The authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:
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