Evaluation of resuscitative efforts on patients in cardiopulmonary arrest regarding code duration and all-cause mortality

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Disclosure

We have no actual or potential conflicts of interest in relation to this program/presentation.

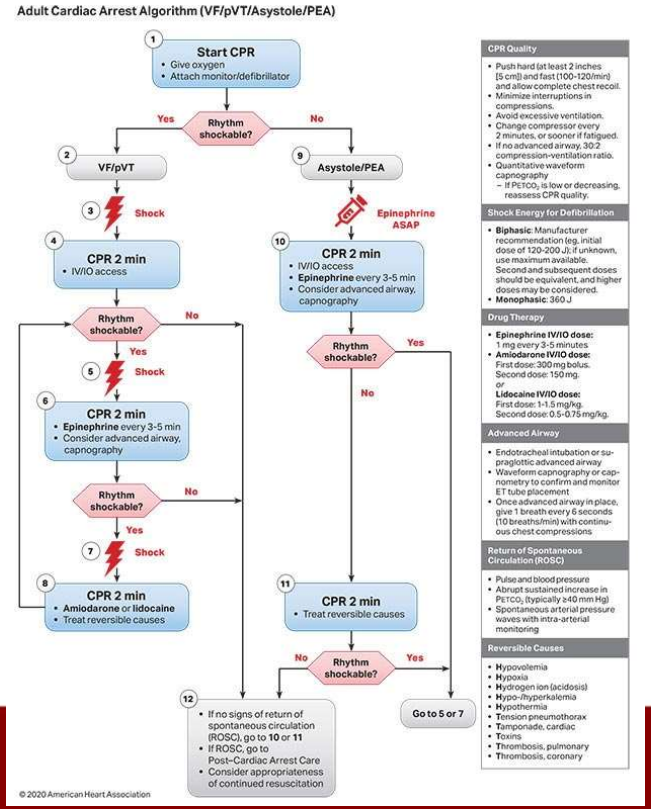
We have no financial interests or relationships to disclose.

Background

- Cardiac arrest is sudden loss of all heart activity
- Usually caused by arrhythmia, H's and T's
- Preceding symptoms include fatigue, dizziness, nausea, chest pain, palpitations, loss of consciousness
- Risk factors – drug abuse, heart disease, family history, elevated BP or cholesterol, obesity

https://www.medanta.org/patient-education-blog/cardiac-arrest-causes-signs-and-symptoms

Background



https://cpr.heart.org/en/resuscitation-science/cpr-and-ecc-guidelines/algorithms

- Identification – loss of consciousness, sudden fall, apnea, pulseless, unresponsive
- Begin CPR immediately, call 911/grab AED (if outside of hospital), hit code button (if in hospital)
- ACLS – clinical guidelines for treatment of cardiac arrest and arrhythmias

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Questions to Answer

- How long should cardiopulmonary resuscitation last?
- Are there factors that influence survival?
- What happens after the code if the patient achieves ROSC?

https://www.storyblocks.com/images/search/question

Objective

- Evaluate correlation between code duration in cardiopulmonary arrest and all-cause mortality
- Look for a relationship between pre-existing risk factors and patient characteristics on mortality during a code
- Measure differences in mortality between patients with different code statuses
- Assess patient outcomes and discharge disposition for patients who survive ACLS

Methodology

- Retrospective correlational study
- Logistical regression of resuscitative efforts during cardiopulmonary arrest and mortality
- Chi square analysis of patient risk categorical variables contributing to survival rate
- One-way ANOVA tests and two-sample t-tests evaluation for resuscitative duration mean values compared across factors of interest

Criteria for Data Selection

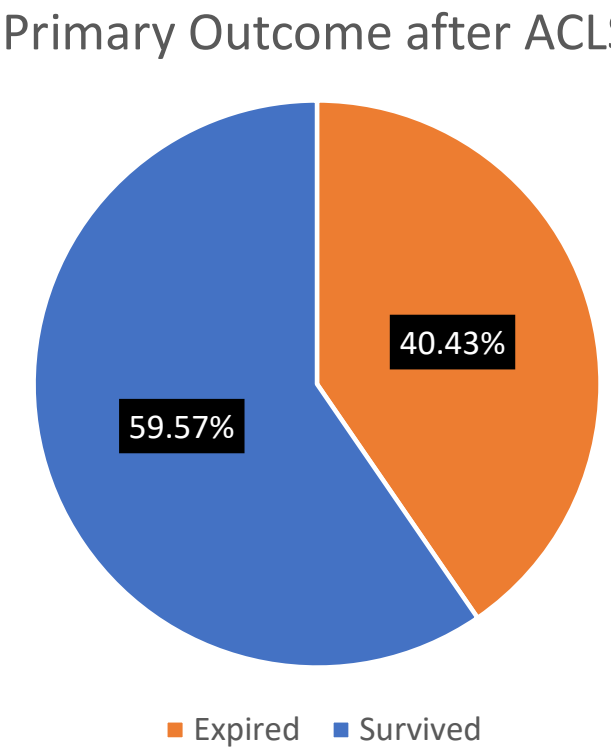
Inclusion

- Age 18 or older
- Cardiopulmonary arrest during hospitalization on medical/surgical floors, PCU, or ICU at AdventHealth Hinsdale campus between 2019 and 2022

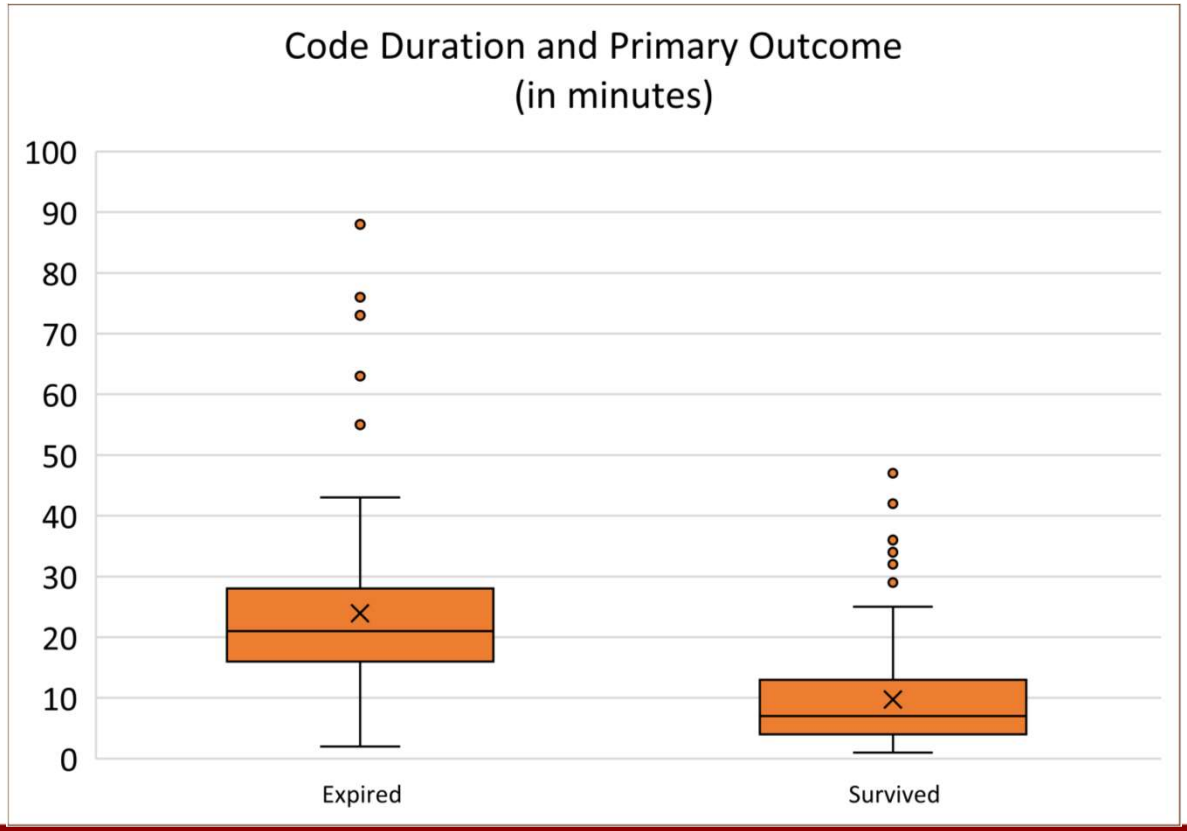
Exclusion

- Resuscitative efforts started initially and then stopped due to DNR status if code duration less than 20 minutes
- Resuscitative efforts stopped prior to 10 minutes due to surrogate decision
- Unable to assess code duration through review of medical record

Results



Results



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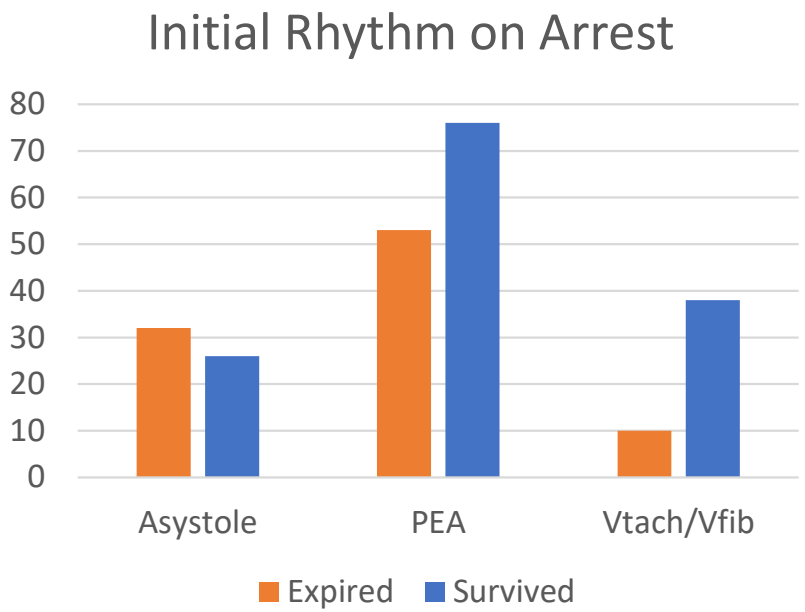
Results

- Patients in shockable rhythms and receiving defibrillation more likely to survive
- No difference between PEA and Asystole
- Importance of shocking early when appropriate



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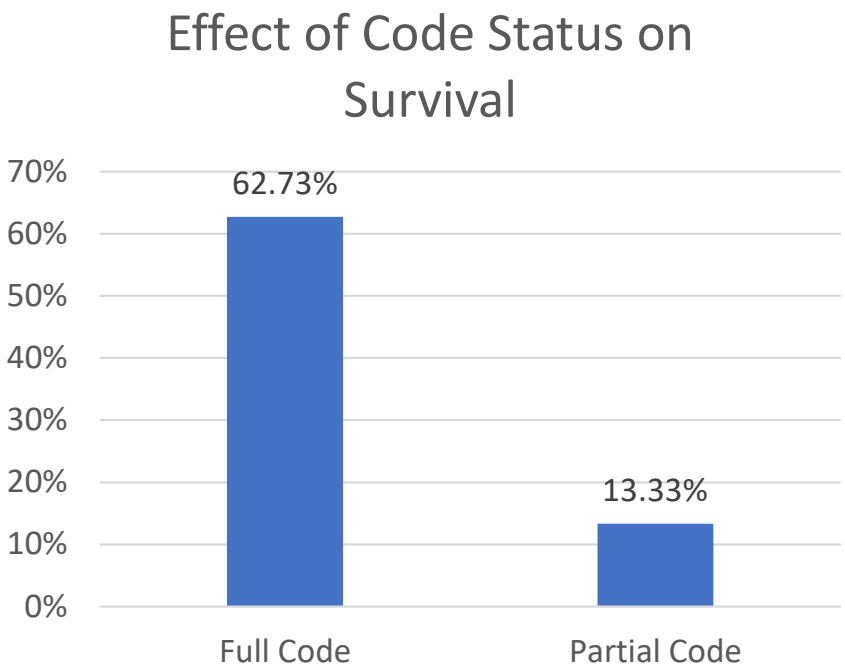
Results



- Partial codes as effective as DNR at achieving ROSC

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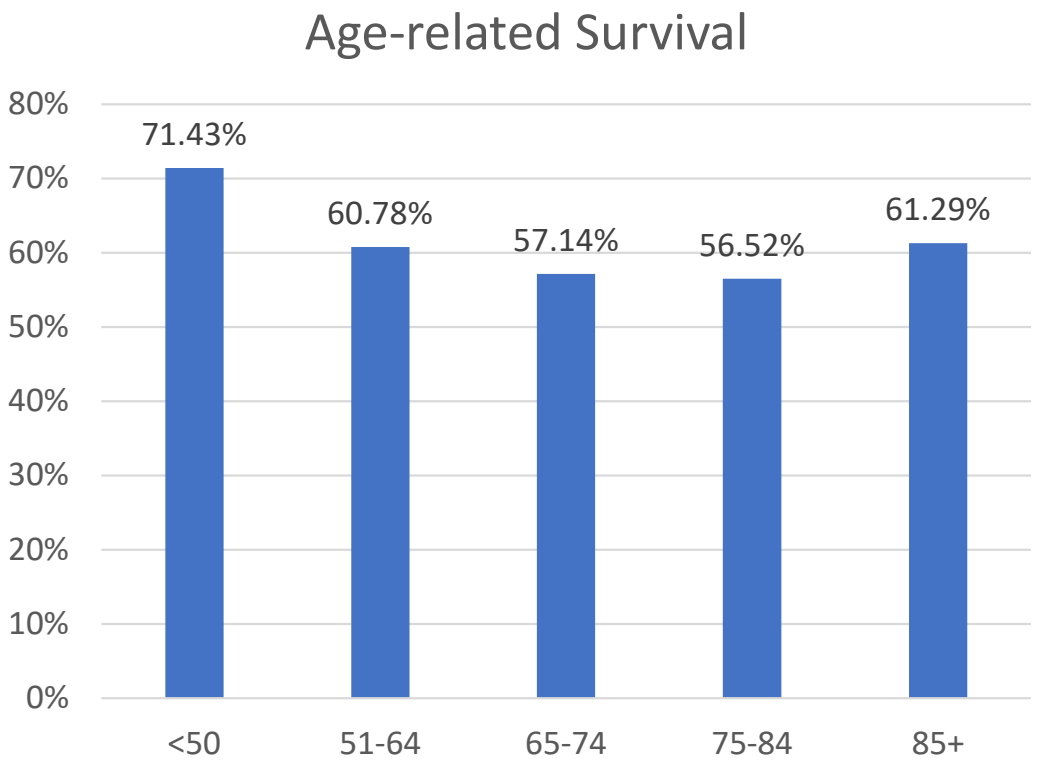
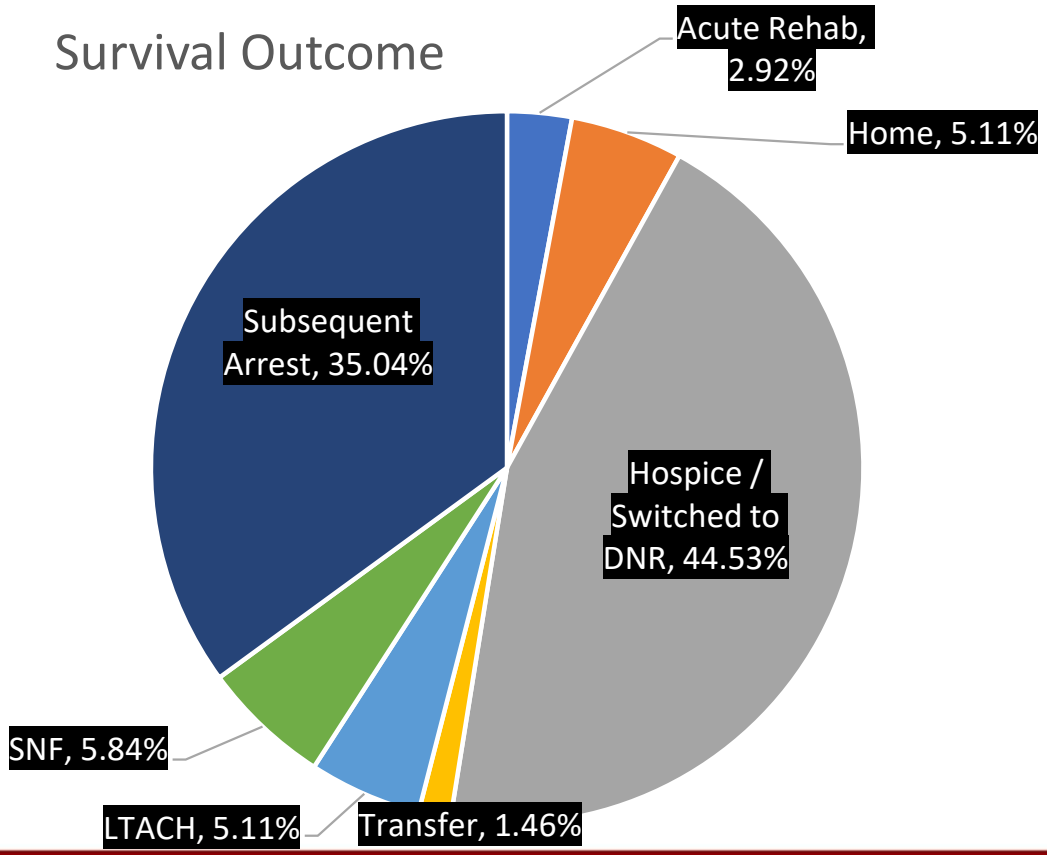
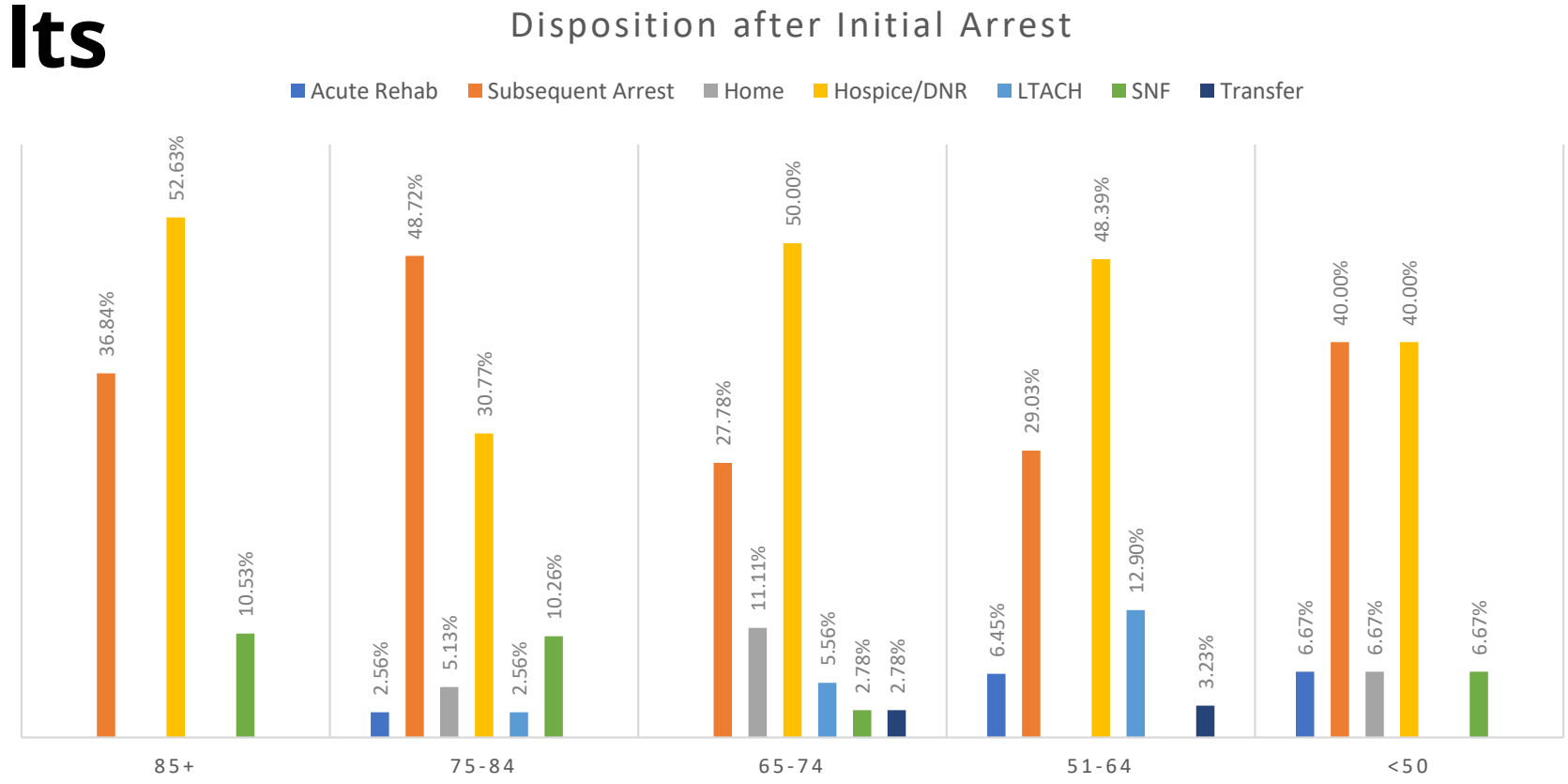
Results


Age-related Survival
80%
70%
60%
50%
40%
30%
20%
10%
0%
71.43%
60.78%
57.14%
56.52%
61.29%
<50
51-64
65-74
75-84
85+

Results


Survival Outcome
Acute Rehab, 2.92%
Home, 5.11%
Subsequent Arrest, 35.04%
Hospice / Switched to DNR, 44.53%
SNF, 5.84%
LTACH, 5.11%
Transfer, 1.46%

Results



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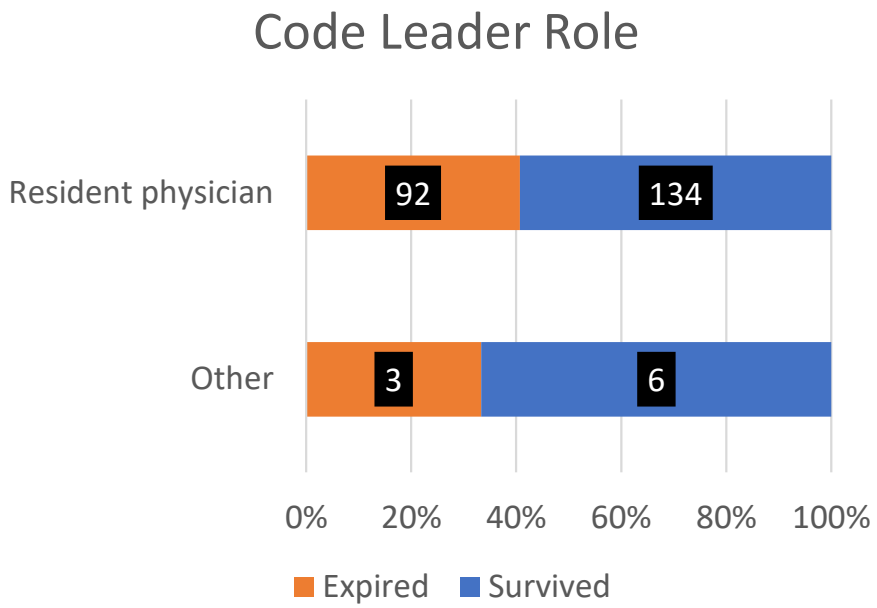
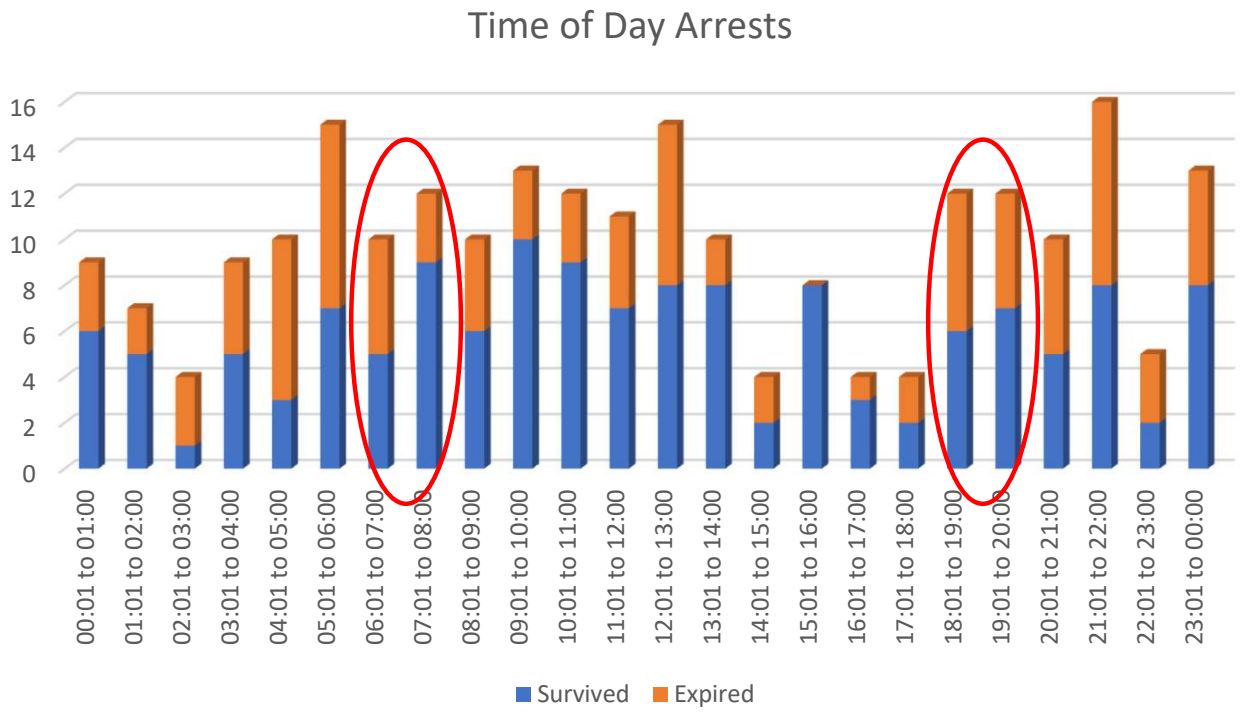
Results


Code Leader Role
Resident physician
92
134
Other
3
6
0%
20%
40%
60%
80%
100%
Expired
Survived

Results



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Results

NO IMPACT ON SURVIVAL

Risk factors

- Acidosis
- Prior CPR
- Inpatient admission within 3 months
- Existing CAD
- Prior valve disease/repair
- HFrEF
- Prior cardiac stent
- Arrhythmia within 24 hours
- Prior thromboembolic event
- Prior MI
- Trauma to head or chest
- Tobacco use PTA
- Poor prognosis documented
- SIRS/Sepsis
- Hypothermia
- Abnormal K^{+}
- Abnormal Mg^{2+}
- Acute liver failure within 24 hours
- Acute kidney failure within 24 hours
- Respiratory failure within 24 hours

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Conclusions

- Resuscitation in 60% of cardiac arrests
- Average duration of successful codes (9.7 min) significantly different from unsuccessful codes (23.9 min)
- Evaluated variables do not impact survival
  - Exceptions - initial rhythm, IV drug use PTA, code status
- 89+% of patients achieve ROSC within 20 minutes

Conclusions

- Defibrillation when appropriate increases survival
- Partial codes cause an increase in mortality
- Mortality not affected by prior CPR during admission, age, renal or hepatic failure, sepsis
- 80% of patients who achieve ROSC code again, enter hospice care, or change code status to DNR

Future Work

- Extend data collection to additional hospitals
- Evaluate codes run by residents compared to other providers

Key Points

- Discuss code status with patients in outpatient setting
- Patients being admitted do not benefit from partial codes
- Resuscitative efforts should not be shortened due to pre-existing conditions

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Thank you for your time!