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Pre-Hospital Traumatic Cardiopulmonary Arrest in Children at a Level 1 Pediatric Trauma Center

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Outcomes of Pre-Hospital Traumatic Cardiopulmonary Arrest at a Level 1 Pediatric Trauma Center

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Introduction

- Survival of traumatic cardiopulmonary arrest (TCA) leading to pre-hospital CPR (p-CPR) is abysmal across age groups
- Children are not protected from poor outcomes (survival 0-25%)
- ACS COT, Am Coll of Emergency Physicians, Nat'l Assoc of EMS Physicians, and AAP released a statement in 2014
 - More studies needed on outcomes to "legitimize" the inclusion of children in termination of resuscitation protocols

Methods

Single institution, retrospective review

Inclusion criteria:

- 0-17 years old
- TCA leading to p-CPR
- Involvement of trauma team (as activation or consultation)
- May 1, 2009-March 1, 2020

Exclusion criteria:

- Medical code event without trauma team involvement

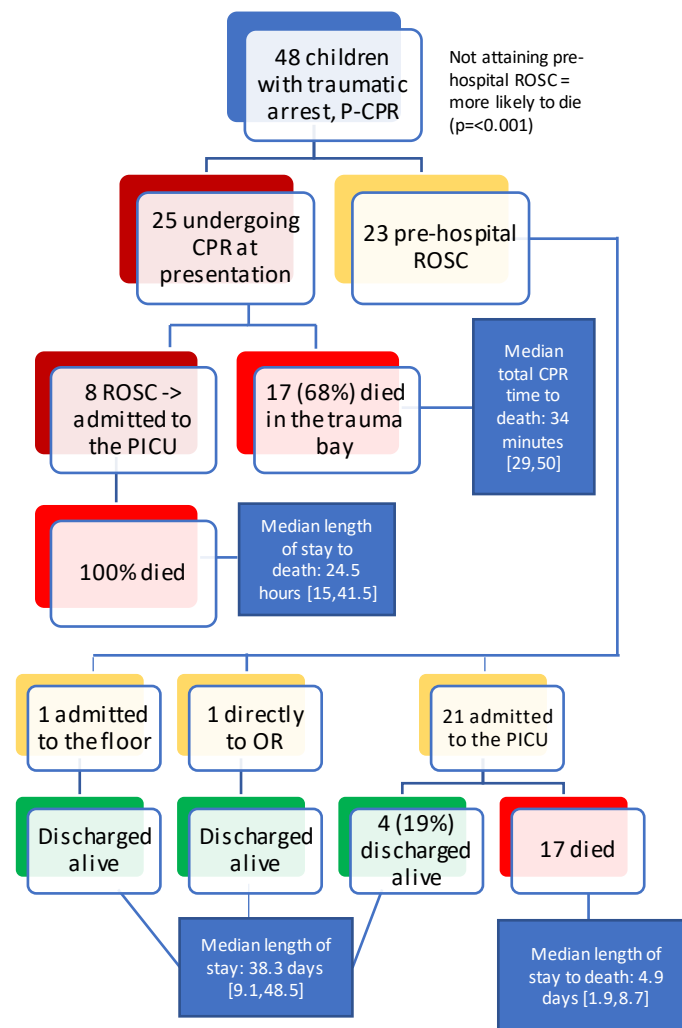
Results

- 48 children met inclusion criteria
- 6 (12.5%) were discharged alive
- No child that was undergoing CPR at presentation survived to discharge

Table 1. Demographics of children with p-CPR started for TCA.

| Demographics | CPR at presentation (n=25) | Pre-hospital ROSC achieved (n=23) | p-value |
|---------------------------------------|----------------------------|-----------------------------------|---------|
| Age (years) | 4.3 [2.2,10.8] | 8.3 [1.2,13] | 0.4 |
| White (%) | 36 (n=9) | 43.5 (n=10) | 0.3 |
| Transferred from outside facility (%) | 8 (n=2) | 21.7 (n=5) | <0.0001 |
| Trauma involvement (%) | | | |
| Full activation | 92 (n=23) | 91.3 (n=21) | 0.7 |
| Trauma consult | 8 (n=2) | 8.7 (n=2) | |

Results



Results

Table 2. Types of injuries leading to p-CPR for TCA.

| Type of injury (%) | CPR at presentation (n=25) | Pre-hospital ROSC achieved (n=23) | p-value |
|--------------------|----------------------------|-----------------------------------|---------|
| Blunt | 64 (n=16) | 62.5 (n=15) | 0.9 |
| Penetrating | 12 (n=3) | 0 | 0.2 |
| Burn | 12 (n=3) | 0 | 0.2 |
| Other | 12 (n=3) | 34.8 (n=8) | 0.1 |

Table 3. Status of 6 surviving children.

| Mechanism | Services required at discharge | Current status | Continued struggles |
|-------------------------|--------------------------------|-----------------------------|---------------------|
| MVC | Rehab center | Walking, driving | Psychiatric |
| Pedestrian Struck #1 #2 | Rehab center, PT PT | Continues PT Can ride bike | Mobility Minimal |
| NAT | Home PT, OT, speech | Resolved seizures, weakness | Cognitive |
| Hanging | Psychiatric facility | Getting GED | Psychiatric |
| Medical | PT | Continues PT | Hemiparesis |

Conclusions

- 100% mortality when pre-hospital ROSC was not attained in traumatic cardiopulmonary arrest
- Those who attained ROSC in the ED universally died in the PICU
- We agree with translation of adult termination-of-resuscitation guidelines to children