

# Timing of Advanced Airway Placement after Out-of-Hospital Cardiac Arrest: Earlier is Better

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## Acknowledgements and Disclosures

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- Christopher Lindsell, PhD

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## Background

- Resuscitation from cardiac arrest requires multiple interventions
- ACLS specifies the optimal timing intra-arrest interventions
- Advanced airways are frequently placed by EMS
- Optimal timing of advanced airway placement is unknown



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### Aim and Hypothesis

- **Aim:** Evaluate the effect that advanced airway timing has on the probability of return of spontaneous circulation (ROSC)
- **Hypothesis:** There exists a time after which the importance of obtaining an advanced airway outweighs other interventions



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### Methods

- **Data Source:** ROC PRIMED study
- **Inclusion Criteria:** Adult out-of-hospital cardiac arrest  
Advanced airway placed by EMS
- **Exclusion Criteria:** Unwitnessed arrest  
EMS witnessed arrest  
Traumatic etiology  
Advanced airway after ROSC
- **Exposure Variable:** Time from EMS arrival to advanced airway
- **Outcome Variable:** Prehospital ROSC



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### Methods

- **Statistical Model:**
  - Cox proportional hazards model
  - Time to advanced airway modeled using non-linear cubic splines
  - Observations stop at (1) ROSC, (2) ED Arrival, or (3) Termination
  - Adjusted for age, sex, bystander CPR, EMS response time
  - Resuscitation duration accounted for by Cox model
  - Stratified by initial cardiac rhythm



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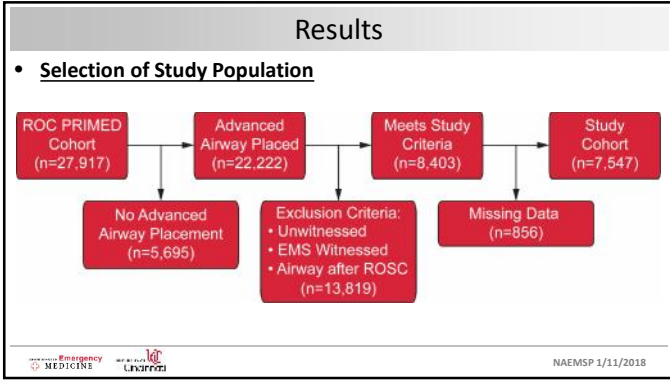
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### Results

- Demographics**

Age (mean, SD)	67 (15)
Sex (male %)	5211 (69.0%)
<b>Bystander Cardiopulmonary Resuscitation (%)</b>	
Yes	3694 (48.9%)
No	3619 (48.0%)
Unknown	234 (3.1%)
<b>Initial Cardiac Rhythm (%)</b>	
Ventricular Tachycardia or Ventricular Fibrillation	2838 (37.6%)
Pulseless Electrical Activity	1908 (25.3%)
Asystole	2255 (29.9%)
No Shock from Automated External Defibrillator	546 (7.2%)

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### Results

- Resuscitation Events**

Advanced Airway Attempt (median, IQR)	1 (1-1)
Prehospital ROSC (%)	3220 (42.7%)
Prehospital Termination of Resuscitation (%)	2382 (31.6%)
<b>Time to Event (minutes, median, IQR)</b>	
Cardiac Arrest Onset to EMS Arrival	5.6 (4.4-7.0)
EMS Arrival to Advanced Airway	10.4 (7.2-14.8)
EMS Arrival to Prehospital ROSC	19.2 (14.3-25.2)
EMS Arrival to Termination of Resuscitation	31.9 (26.7-37.1)
EMS Arrival to Hospital Arrival	35.9 (28.9-44.0)

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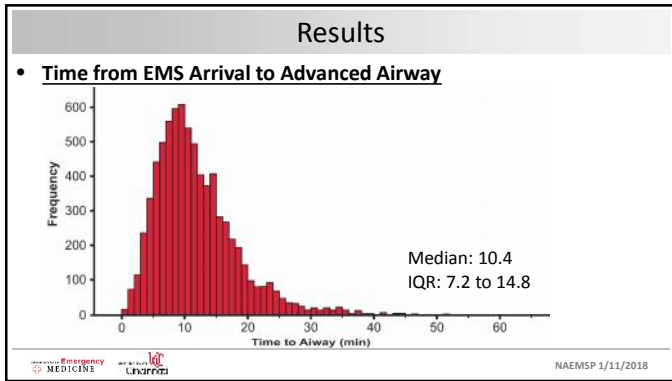
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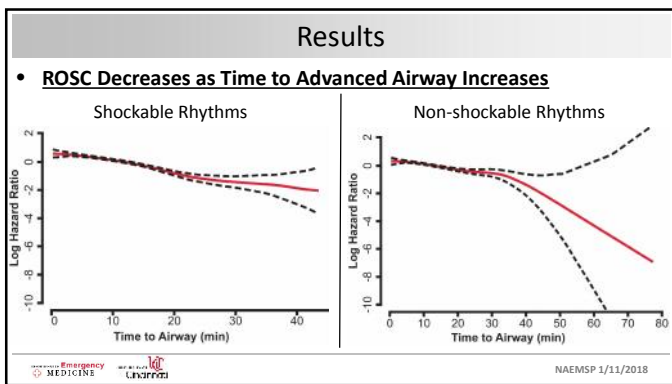
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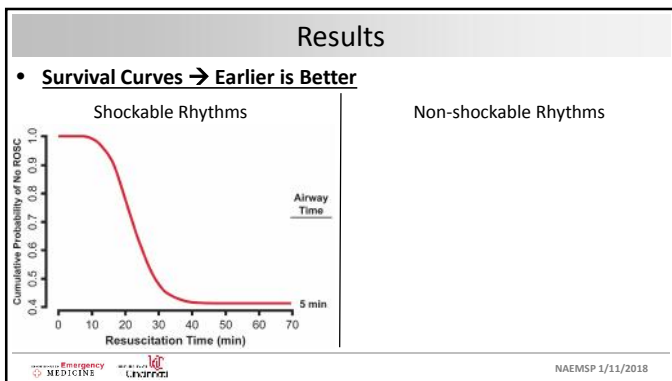
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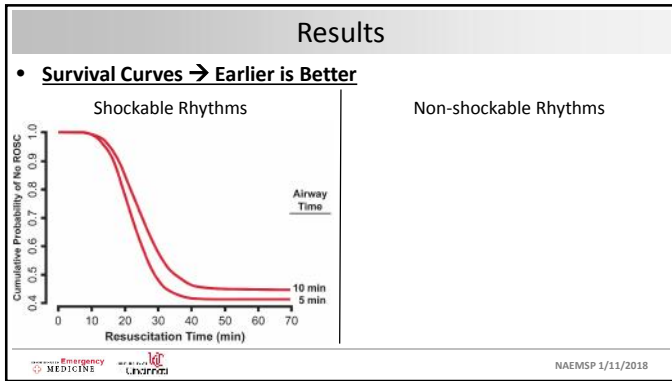
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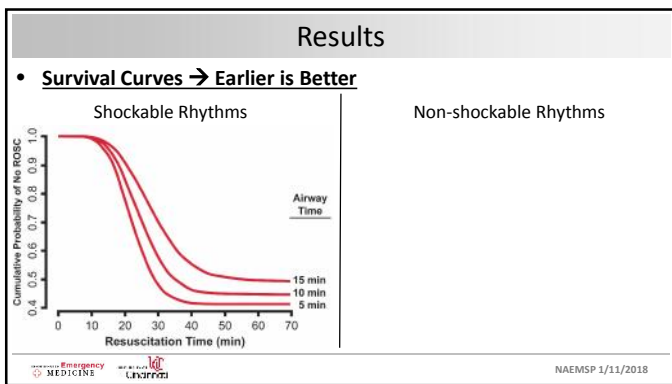
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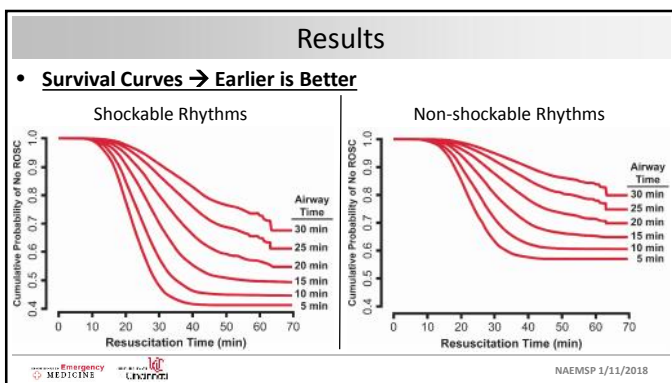
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### Limitations

- Does not address BVM-only strategy
- Number of airway attempts
- Endotracheal tubes vs. supraglottic airways
- EMS system-specific data



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### Conclusions

- Advanced airway placement by EMS for out-of-hospital cardiac arrest has a time-dependent association with ROSC
- Early advanced airways are associated with increased probability of ROSC and a decreased time to ROSC



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