

## Clinical Decision Priorities in Out-of-Hospital Cardiac Arrest

Comilla Sasson, MD, MS  
Robert Wood Johnson Clinical Scholar  
University of Michigan  
Department of Emergency Medicine

October 29<sup>th</sup>, 2009



## Guiding EMS Practice for OHCA

- Current EMS Practice for the Termination of Resuscitation (TOR) of Unsuccessful Efforts
- Evidence-based Recommendations
- Barriers to Implementing National Guidelines
- Next Steps



## Variation in Survival

- 166,200 sudden cardiac deaths per year<sup>1</sup>
  - 60% are treated by EMS services
- Survival rates vary by city<sup>2,3</sup>

**Detroit**      **VS**      **Seattle**  
**0.2%**                      **16.3%**

1. Rosamond et. al., *Circulation* 2008  
2. Dunne et. al., *Resuscitation* 2007  
3. Nichol et. al., *JAMA* 2008



**9 out of 10 people with a cardiac arrest will not survive<sup>4</sup>**



4. Sasson, et. al., *Circulation: Cardiovascular Quality and Outcomes*. In Press



## What's Driving the Disparities?

- Huge Variation in Termination of Resuscitation Protocols<sup>5</sup>
- Public Policy and Operational Barriers to Implementation of Evidence-based Guidelines<sup>6,7</sup>

5. Sasson et. al., *JAMA* 2008  
6. Sasson et. al., *Circulation: Cardiovascular Quality and Outcomes*, 2009  
7. Sasson et. al. *Prehospital Emergency Care*, Under Revision



## How Does Prehospital TOR Affect EMS?

- Opportunity Cost
  - Transport of futile resuscitations risks the lives of public and EMS providers
  - Financial cost associated with unnecessary transport
  - Decreases healthcare resources from patients with treatable, time-sensitive conditions (i.e. stroke, heart attack)



## Why Does it Matter?

- From 1992-1997<sup>8</sup>
  - 114 EMS Worker Fatalities
  - 58.7% Ground Transportation
- 12.7 fatalities per 100,000 EMS workers
  - 14.2 for Police
  - 16.5 for Firefighters
  - National Average of 5.0

8. Maguire et. al., *Annals of Emergency Medicine*, 2002



## 30 Years of Research



## Purpose of the Study

- Utilize the Cardiac Arrest Registry to Enhance Survival (CARES) to externally validate 2 Clinical Decision Rules to Terminate Unsuccessful Resuscitation for OHCA in the Prehospital Setting



## Methods

- Retrospective cohort study
  - Oct. 1st, 2005 to April 30th, 2008
- Setting- 8 major U.S. Cities
  - Anchorage, Metropolitan Atlanta, Austin, Boston, Cincinnati, Columbus, Houston, Raleigh



## Clinical Decision Rules for Prehospital Termination of Resuscitation

BLS Rule	ALS Rule
1) Event not witnessed by EMS	1) Event not witnessed by EMS
2) No AED/manual shock in field	2) No AED/manual shock in field
3) No return of spontaneous circulation in field	3) No return of spontaneous circulation in field
	4) Event not witnessed by bystander
	5) No bystander CPR



## Primary Outcomes

1. Does the rule predict who will survive to discharge?
2. Will there be a difference in field pronouncement rate?



## Results

- 5,505 patients were eligible
- 2592 patients met BLS criteria
  - 70 patients admitted to hospital
  - 5 survived to d/c
- 1192 patients met ALS criteria
  - 24 admitted to hospital
  - 0 survived to d/c

## Field Pronouncement Rate Patients NOT Transported

### BLS Rule

17% → 47% = 2592 Patients

### ALS Rule

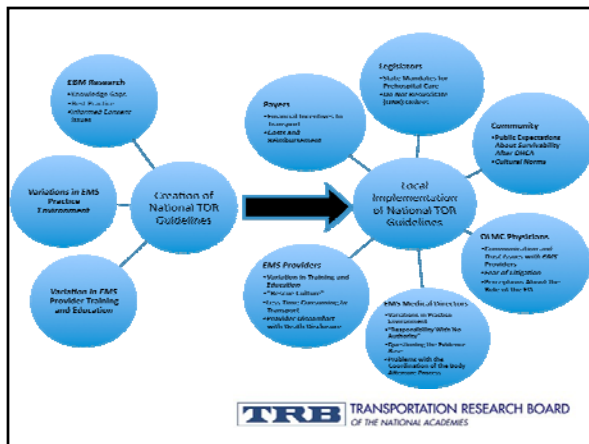
17% → 22% = 1192 Patients

## Policy Implications

- Standardize the practice of TOR for OHCA
  - Strengthen existing guidelines by the AHA/ILCOR (which currently state asystole/ROSC consider non-transport)
- Decrease opportunity costs of futile resuscitations
  - People in the community, paramedics, healthcare system

## Barriers to Local Implementation of National TOR Guidelines

- Qualitative Study
- 3 Focus Groups conducted at the National Association of EMS Physicians Meeting in January 2008
- 24 Participants from U.S. and Canada



## Public Policy Issues

Stakeholder	Barriers
<b>Payers</b>	<ol style="list-style-type: none"> <li>1. Financial Incentives to Transport</li> <li>2. Costs and Reimbursement</li> </ol>
<b>Legislators</b>	<ol style="list-style-type: none"> <li>1. State Mandates for Prehospital Care</li> <li>2. Do-Not-Resuscitate (DNR) Orders</li> </ol>
<b>Community Members</b>	<ol style="list-style-type: none"> <li>1. Public Expectations About Survivability After OHCA</li> <li>2. Cultural Norms</li> </ol>

## Facilitators to Knowledge Transfer

- National Organizations:
  - National Highway Traffic Safety Association
  - American Heart Association
  - American College of Emergency Physicians
  - National Association of EMS Physicians
- Legislators
  - Remove mandates for transport
  - Standardize DNR/DNI Orders
- Payers
  - Policy-neutral Reimbursement Policies

## Operational Issues

STAKEHOLDER	BARRIERS
EMS Providers	<ol style="list-style-type: none"> <li>1. Variation in Training and Education</li> <li>2. "Rescue Culture"</li> <li>3. Easier to Transport</li> <li>4. Provider Discomfort with Death Disclosure</li> </ol>
EMS Medical Directors	<ol style="list-style-type: none"> <li>1. Variations in Practice Environment</li> <li>2. "Responsibility With No Authority"</li> <li>3. Questioning the Evidence-Base</li> <li>4. Problems with the Coordination of the Body Aftercare Process</li> </ol>
On-Line Medical Control Physicians	<ol style="list-style-type: none"> <li>1. Communication and Trust Issues with EMS Providers</li> <li>2. Fear of Litigation</li> <li>3. Perception About the Role of the ED</li> </ol>

## Facilitators to Knowledge Transfer

- Improve Communication between EMS/ Medical Directors and OLMC
  - Strengthen current AHA/ILCOR Guidelines on Termination of Resuscitation
- Standardize Educational Requirements
- Increase Coordination of Local Services
  - Streamline Body Aftercare and Family Support System

## Next Steps

- What we know
  - Evidence Base for Termination of Resuscitation
  - Identified Public Policy and Operational Issues
- What we don't know
  - Who is currently using these evidence-based guidelines?
  - Do they have an impact on decreasing EMS fatalities?
- What we need to know
  - Better collection of EMS crash data
  - Impact of changing financial reimbursement structure and DNR orders on OHCA termination of resuscitation practices

## References Cited

1. Rosamond W, Flegal K, Furie K, et al. Heart disease and stroke statistics--2008 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation*. Jan 29 2008;117(4):e25-146.
2. Dunne RB, Compton S, Zalenski RJ, Swor R, Welch R, Bock BF. Outcomes from out-of-hospital cardiac arrest in Detroit. *Resuscitation*. Jan 2007;72(1):59-65.
3. Nichol G, Thomas E, Callaway CW, et al. Regional variation in out-of-hospital cardiac arrest incidence and outcome. *JAMA*. Sep 24 2008;300(12):1423-1431.
4. Sasson CR, M. Dahl, J. Kellermann, AK. Predictors of Survival following an Out-of-Hospital Cardiac Arrest: A Systematic Review and Meta-Analysis. *Circ Cardiovasc Qual Outcomes*. 2009; Accepted for Publication.
5. Sasson C, Hegg AJ, Macy M, Park A, Kellermann A, McNally B. Prehospital termination of resuscitation in cases of refractory out-of-hospital cardiac arrest. *JAMA*. Sep 24 2008;300(12):1432-1438.
6. Sasson C, Forman J, Krass D, Macy M, Kellermann AL, McNally BF. A Qualitative Study to Identify Barriers to Local Implementation of Prehospital Termination of Resuscitation Protocols. *Circ Cardiovasc Qual Outcomes*. June 30, 2009. *CIRCOUTCOMES*.108.830398.
7. Sasson C, Forman J, Krass D, et al. A Qualitative Study to Understand Barriers to Implementation of National Guidelines for Prehospital Termination of Unsuccessful Resuscitation Efforts *Prehospital Emergency Care*. 2009; Under Revision.

## Questions??

- Please raise your hand or type in the message box