Post-Cardiac Arrest Therapeutic Hypothermia in New Jersey Hospitals: Analysis of Adoption and Implementation

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Therapeutic hypothermia (TH)

• Fairly new & innovative treatment for out-of-hospital cardiac arrest (OHCA)
  – Reduce body temperature during post-arrest treatment
  – Improve survival & neurological outcomes

• TH now recommended treatment for OHCA
  – International Liaison Committee on Resuscitation, 2005
  – American Heart Association, 2010

• But TH is not universally used
  – Difficult to set up & maintain TH capability
  – Doubts about (limited) evidence base
Our project (overall)

**Aim 1:** Create linked database for NJ
Prehospital EMS (EHRs) $\rightarrow$ Hospital billing records $\rightarrow$ Mortality records

**Aim 2:** Conduct CER study of TH vs. non-TH OHCA care

- Coding of TH in hospital billing records
  - ICD-9-CM code exists
  - No reimbursement consequences
  - Likely under/no reporting

- We conducted a survey of TH use by NJ hospitals
- Today’s presentation reports on survey results
Survey of NJ hospitals

• Fielded in Summer 2011

• Brief telephone survey (5-10 minutes)
  – ED nurse manager (or similar position)
  – TH use, protocols, related issues
  – Written protocols if available

• Fallback: 90-second version
Participation

- Universe = 73 acute care hospitals
- 54 full interviews
- 19 brief (fallback) interviews
- 18 written protocols
  (21 hospitals)
NJ hospitals providing TH, Summer 2011

- Currently providing TH: 68.4%
- Plan to provide TH: 13.7%
- Not providing TH & no plans: 17.8%

Based on 73 acute care hospitals in all NJ hospitals
Growth in # NJ hospitals providing TH

* 3 additional hospitals provided TH in 2011 but could not report how long the TH program had been in place. Therefore, 2011 total is 50.
TH provision by annual OHCA volume

Based on 54 hospitals w/full survey data. Percentages sum to 100 within colored bars.
TH provision & other hospital characteristics

• Little or no difference by …
  – Teaching status
  – Patient volume
  – Occupancy rate
Exclusion criteria: Patient characteristics

17.9% of TH hospitals exclude based on all 8 conditions asked.

Based on 39 TH hospitals w/full survey data.
Inclusion criteria: ECG rhythms

51.3% of TH hospitals provide TH for all 4 rhythms.

- VT: 91.9%
- VF: 89.2%
- PEA: 71.1%
- Asystole: 65.8%

Based on 39 TH hospitals w/full survey data.
### Cooling methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialized systems</td>
<td>80.0%</td>
</tr>
<tr>
<td>I/V fluids</td>
<td>74.4%</td>
</tr>
<tr>
<td>Cold packs</td>
<td>59.0%</td>
</tr>
<tr>
<td>Blankets</td>
<td>51.3%</td>
</tr>
<tr>
<td>Endovascular catheter</td>
<td>28.9%</td>
</tr>
<tr>
<td>Others</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

Based on 39 TH hospitals with full survey data.

35.9% of TH hospitals coordinate cooling with prehospital EMS.
Written protocols

• Large variation in ...
  – Duration of TH
  – Defined start of duration time
  – Time to reach target temperature
  – Re-warming time
  – Measurement & response to patient shivering

• Large variation in protocol details
  – Level of detail
  – What gets mentioned
Summary

• Most NJ hospitals implementing TH guidelines

• Large variation in the way guidelines are implemented

• TH centers often see very low volume of OHCA patients
  – TH volume even smaller given patient exclusions

• > 1/3 of TH centers coordinate patient cooling in prehospital setting
Implications

- Variation in TH practice
  - Does it affect patient outcomes?
  - What does it mean to follow practice guidelines?

- Patient selection criteria ==> access disparities?

- Low TH volume & quality of care
  - Prior research ==> better outcomes if annual OHCA cases ≥ 40

- Factors that determine adoption of TH guidelines not well understood
  - Reputation/marketing, peer influence?
For more information …


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