Employing Knowledge Translation Interventions to Increase Utilization of Therapeutic Hypothermia Post-Arrest

The Strategies for Post-Arrest Care (SPARC) Stepped Wedge Randomized Trial

Laurie Morrison on behalf of the SPARC Network
SPARC Investigators

- Damon Scales (Co PI)
- Paul Dorian (Co PI)
- Katie Dainty
- Steve Brooks
- Gordon Rubenfeld
- Niall Ferguson
- Dale Needham
- Kevin Thorpe
- Randy Wax
- Art Slutsky
- Muhammed Mumdani
Funding Partners
Disclosures

• ALS taskforce chair – ILCOR
  – Consensus on Science Circulation 2010

• AHA guidelines
  – ALS, Ethics, Special Circumstances chapters
  – published in Circulation 2010

• Chair Research Health Policy for HSFC
SPARC Network – 37 hospitals
2009 Inhospital Survival Variability

- 37 Destination Hospitals for OHCA
  - Survival to D/C vary from 0 – 46%
  - Mean survival to D/C of 32%

- 25 hospitals > 36/yr: Survival Rate 3 – 24%
- 12 hospitals <10/yr: Survival Rate 0 – 13%

*Baseline 50% cooling initiated rate but … only 10% cooled to 34 within 6 hours*
Sunde et al.... IH survival of 37%

- Observational trial
- Standardized protocol
- Local Champion
- “Get with the guidelines”
- Effective implementation
- Increased survival at one year to over 50%

- OHCA - Inhospital treatment independent predictor
Get with the Guidelines
Goal of the Network

To establish a large network of destination hospitals treating OHCA to evaluate the translation of guidelines and science into post-arrest care to improve survival

First Step:

1. Focusing on improving the use of therapeutic hypothermia in post-arrest patients
2. Employ a multifaceted KT implementation strategy
### Stepped Wedge Design - RCT

<table>
<thead>
<tr>
<th>Months</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wedge 1</td>
<td>Passive Phase</td>
</tr>
<tr>
<td>Wedge 2</td>
<td>Baseline Phase</td>
</tr>
<tr>
<td>Wedge 3</td>
<td></td>
</tr>
<tr>
<td>Wedge 4</td>
<td></td>
</tr>
</tbody>
</table>

7 Hospitals/wedge
## Stepped Wedge Design - RCT

<table>
<thead>
<tr>
<th>Months</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wedge 1</td>
<td>7 Hospitals/wedge</td>
</tr>
<tr>
<td>Wedge 2</td>
<td>Baseline Phase</td>
</tr>
<tr>
<td>Wedge 3</td>
<td></td>
</tr>
<tr>
<td>Wedge 4</td>
<td></td>
</tr>
</tbody>
</table>

---

### SPARC

- Active Phase
- Passive Phase

---

*St. Michael's*

*Inspired Care. Inspiring Science.*

*Medicine*

*UNIVERSITY OF TORONTO*

*rescu*
SPARC

Stepped Wedge Design - RCT

<table>
<thead>
<tr>
<th>Time</th>
<th>Months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Wedge 1</td>
</tr>
<tr>
<td></td>
<td>Wedge 2</td>
</tr>
<tr>
<td></td>
<td>Wedge 3</td>
</tr>
<tr>
<td></td>
<td>Wedge 4</td>
</tr>
</tbody>
</table>

- Active Phase
- Passive Phase
- Baseline Phase

7 Hospitals/wedge
SPARC

Stepped Wedge Design - RCT

<table>
<thead>
<tr>
<th>Months</th>
<th>Wedge 1</th>
<th>Wedge 2</th>
<th>Wedge 3</th>
<th>Wedge 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Wedge Phase**: Baseline Phase
- **Passive Phase**
- **Active Phase**: Protocol Order Set

7 Hospitals/wedge
## SPARC

### Stepped Wedge Design - RCT

<table>
<thead>
<tr>
<th>Time</th>
<th>Months</th>
<th>Wedge 1</th>
<th>Wedge 2</th>
<th>Wedge 3</th>
<th>Wedge 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Baseline Phase</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Passive Phase**
- **Active Phase**
- **Site Specific Intervention**
- **Protocol Order Set**

7 Hospitals/wedge
Stepped Wedge Design - RCT

- Active Phase
- Passive Phase
- Site Specific Intervention
- Protocol Order Set

Months

Wedge 1
- Baseline Phase

Wedge 2
- Baseline Phase

Wedge 3

Wedge 4

7 Hospitals/wedge
SPARC

Stepped Wedge Design - RCT

<table>
<thead>
<tr>
<th>Months</th>
<th>Wedge 1</th>
<th>Wedge 2</th>
<th>Wedge 3</th>
<th>Wedge 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Phase</td>
<td>Baseline Phase</td>
<td>Passive Phase</td>
<td>Active Phase</td>
<td></td>
</tr>
</tbody>
</table>

7 Hospitals/wedge

Site Specific Intervention

Protocol Order Set

St. Michael’s
Inspired Care. Inspiring Science.
Stepped Wedge Design - RCT

Time

<table>
<thead>
<tr>
<th>Months</th>
<th>Wedge 1</th>
<th>Wedge 2</th>
<th>Wedge 3</th>
<th>Wedge 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseline Phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passive Phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active Phase</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7 Hospitals/wedge

Protocol Order Set

Site Specific Intervention

SPARC
The Interventions

• Passive
  – Generic protocol
  – Generic order sheets
  – SPARC website with free resources
    www.sparcnetwork.ca

• Active
  – Nurse Educator - Site specific approach
    • Define the barriers
    • Find solutions
    • Educate
    • Site specific reports
    • Launch the blog
SPARC Network

Strategies for Post-Arrest Resuscitation Care

1. What is SPARC? What is therapeutic hypothermia?

SPARC is a new collaborative network of hospitals, involving local emergency department, intensive care unit physician and nursing leaders who will participate in a comprehensive program designed to standardize, monitor, and improve the care of patients resuscitated from out-of-hospital and in-hospital cardiac arrest.

To find out more about the Strategies for Post ARrest Care Network and Therapeutic Hypothermia for cardiac arrest survivors, click here and take a look at the network brochure.
- Credit Valley Hospital - Hypothermia Protocol Mar 2007
- Example AED Protocol for Sudden Cardiac Arrest
- Example of a Code Blue Data Collection System
- Hypothermia 101 Slides April 2007 (SPARC)
- Overview Comparison of Cooling Methods - April 2007
- Project Plan Overview - SPARC Hypothermia - April 2007
- SPARC Hospital Contacts April 24 2007
- SPARC Meeting Notice - June 13 2007
- SPARC Project Steering Committee 2007
- June 13th Meeting
  - Network Introduction
  - Networks for Best Practices in ICU - Scales
  - Package 1
  - Project Funding Information
  - SPARC Project Information
  - Standardized Protocol Workshop
  - Successful Hypothermia Case at SMH
  - The MOH ICU Clinical Best Practice Project - Overview
  - The Science of Hypothermia
  - Tools & Resources
Hello!

Welcome to the SPARC Network Forum!

We hope that this forum will provide a unique opportunity for members of the SPARC Network to discuss and share their experience and expertise.

Please feel free to read all the discussions and post your comments.

If you have any problems or questions regarding the forum or the SPARC Network please contact Leah Szadkowski at leah.szadkowski@sunnybrook.ca

Thanks!

SPARC Team
SPARC

Annual Networking In-Person Symposium
SPARC

Vendors Meeting
### On Arrival to First Hospital ED

<table>
<thead>
<tr>
<th>Site Linking ID (aka Epistry ID)</th>
<th>64848</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Transferred FROM another hospital?</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Date of arrival to first hospital ED</strong></td>
<td>2011/03/07</td>
</tr>
<tr>
<td><strong>Time of arrival to first hospital ED</strong></td>
<td>17:23</td>
</tr>
<tr>
<td><strong>Pulses present at arrival to ED?</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Cardiac rhythm with pulse in ED?</strong></td>
<td>Sinus Tachycardia</td>
</tr>
<tr>
<td><strong>Did patient have ROSC &gt; 20 minutes in ED?</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Date of first in-hospital sustained ROSC for &gt;20 minutes in ED</strong></td>
<td>2011/03/07</td>
</tr>
<tr>
<td><strong>Time of first in-hospital sustained ROSC for &gt;20 minutes in ED</strong></td>
<td>17:23</td>
</tr>
<tr>
<td><strong>Was the SP02 % recorded post ROSC?</strong></td>
<td>Yes</td>
</tr>
<tr>
<td><strong>SP02 %</strong></td>
<td>99</td>
</tr>
</tbody>
</table>

**Was the patient pronounced within 6 hours of ED arrival?** No
**Was the patient transferred to another hospital within 6 hours of ED arrival?** No

### Admission

**Was the patient admitted to hospital?** Yes
**Where was the patient admitted?** ICU
**Admission order date** | 2011/03/07 |
| **Admission order time** | 19:00 |
| **Date of arrival at ICU/CU ward** | 2011/03/07 |
| **Time of arrival at ICU/CU ward** | 19:25 |

### Past Medical History

**Bleeding diagnosis** | Not noted |
SPARC

24-7 Access to Institutional Data and Reports
Social Media Strategies

• OTN Videoconference Sessions
  – Well attended; lots of sharing and help with resolutions

• Website
  – 3740 views by 1604 unique IDs

• Blog
  – Not as popular as we thought it would be
Outcomes

• Primary
  – Cooled to 34 degrees within 6 hours of first ED arrival time

• Secondary
  – Cooling initiated in eligible patients
  – Cooling initiated by ED
  – Cooling initiated in any patients by anyone
  – Cooling initiated inappropriately
  – Cooling duration
  – Survival to discharge in all patients
### Results

#### Demographics

<table>
<thead>
<tr>
<th>Utstein Characteristics</th>
<th>Baseline#</th>
<th>Passive #</th>
<th>Active #</th>
<th>Passive and Active #</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1477</td>
<td>1771</td>
<td>1573</td>
<td>3344</td>
</tr>
<tr>
<td>Age (yr) Mean (SD)</td>
<td>65.3 (18.9)</td>
<td>63.4 (19.4)</td>
<td>65 (20)</td>
<td>64.2 (19.7)</td>
</tr>
<tr>
<td>Gender (male %)</td>
<td>66.9</td>
<td>67.5</td>
<td>64.3</td>
<td>66</td>
</tr>
<tr>
<td>Public arrest</td>
<td>393</td>
<td>447</td>
<td>349</td>
<td>796</td>
</tr>
<tr>
<td>No Obvious cause</td>
<td>1378</td>
<td>1640</td>
<td>1347</td>
<td>2987</td>
</tr>
<tr>
<td>Bystander witnessed</td>
<td>628</td>
<td>774</td>
<td>638</td>
<td>1412</td>
</tr>
<tr>
<td>Bystander CPR</td>
<td>453</td>
<td>563</td>
<td>448</td>
<td>1011</td>
</tr>
<tr>
<td>Bystander Shocked with AED</td>
<td>22</td>
<td>34</td>
<td>28</td>
<td>62</td>
</tr>
<tr>
<td>Initial rhythm - VF/VT/shockable</td>
<td>30.8</td>
<td>31</td>
<td>26.6</td>
<td>28.9</td>
</tr>
<tr>
<td>Response time (min) Mean (SD)</td>
<td>6.8 (5.4)</td>
<td>6.4 (2.6)</td>
<td>6.8 (9.6)</td>
<td>6.6 (6.7)</td>
</tr>
</tbody>
</table>
Cooling rates across institutions
Cooling rates across institutions

• 3 hospitals 0%
  – volumes 5-20/year
• 4 hospitals 100%
  – volumes 3-45/year
Cooling rates across institutions

- 3 hospitals 0%
  - volumes 5-20/year
- 4 hospitals 100%
  - volumes 3-45/year
- 19 hospitals >60%
  - volumes 18-119/year
Outcomes

• Cooling to 34°
  – Passive KT marked improvement over baseline

• Cooling to 34°
  – Active KT no improvement over passive

• ED Initiated Cooling
  – Active KT significantly increased rates

• OR 2.14 95% CI 1.46 to 3.13 p < 0.05

• OR 0.92 95% CI 0.66 to 1.29 p = 0.6

• p = 0.02
Cooled to 34° within 6 hours

- Passive KT
- Active KT
- Guidelines
- Baseline rate of Cooling

Days Since Passive Began

Probability of Successful Cooling
Cooled to 34° within 6 hours

- Passive KT
- Active KT
- Baseline rate of Cooling
- Guidelines
Cooled to 34° within 6 hours

- Passive KT
- Active KT
- Guidelines

Probability of Successful Cooling

Days Since Passive Began

Baseline rate of Cooling
ED Initiated Cooling

Probability of Cooling in ED vs Days Since Passive Began

- Passive
- Active
- Baseline

Guidelines
Passive KT
ED Initiated Cooling

Probability of Cooling in ED

Days Since Passive Began

Guidelines

Passive KT

Active KT
What we have learned
What we have learned

– Guidelines alone will not change baseline care rates
What we have learned

– Guidelines alone will not change baseline care rates

– Translation requires
  • protocol and
  • order set at a minimum,
  • a team approach and
  • measuring key performance indicators
What we have learned

– Guidelines alone will not change baseline care rates

– Translation requires
  • protocol and
  • order set at a minimum,
  • a team approach and
  • measuring key performance indicators

– ED requires active KT to effect behaviour change
What we have learned

– Guidelines alone will not change baseline care rates

– Translation requires
  • protocol and
  • order set at a minimum,
  • a team approach and
  • measuring key performance indicators

– ED requires active KT to effect behaviour change

– ICU and ED working in synchrony are essential to success
Consort Diagram

Transported to ED
4856 *

CNO 33

Critical variables
irretrievable
2

Complete with
ROSC
1963

Complete without
ROSC
2858

Prospective Cohort Comparison

Short and Long
Term Survival

Eligible for cooling
1104

Cooled 638

Not cooled 466

Not eligible for
cooling
859

Cooled 177

Not cooled 682
# Utstein Characteristics

<table>
<thead>
<tr>
<th>Utstein Characteristics</th>
<th>Eligible for Cooling</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cooled</td>
<td>Not Cooled</td>
</tr>
<tr>
<td>Total</td>
<td>472</td>
<td>301</td>
</tr>
<tr>
<td>Age (yr) Mean (SD)</td>
<td>64</td>
<td>71</td>
</tr>
<tr>
<td>Gender (male %)</td>
<td>73%</td>
<td>58%</td>
</tr>
<tr>
<td>Public arrest</td>
<td>32%</td>
<td>26%</td>
</tr>
<tr>
<td>Bystander witnessed</td>
<td>60%</td>
<td>47%</td>
</tr>
<tr>
<td>Bystander CPR</td>
<td>41%</td>
<td>30%</td>
</tr>
<tr>
<td>PAD Applied</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>Initial rhythm - VF/VT/shockable (%)</td>
<td>55%</td>
<td>30%</td>
</tr>
<tr>
<td>Bystander witnessed and VFVT/Shockable (%)</td>
<td>65.7</td>
<td>38.7</td>
</tr>
<tr>
<td>Response time (min) Mean (SD)</td>
<td>6.7 (15.1)</td>
<td>6.6 (2.6)</td>
</tr>
</tbody>
</table>
SPARC

Survival OR - Unadjusted

NNT of 12

Unadjusted

Survival at 24
Survival at 72
Survival at D/C

Favours Cooling

0.5
1.0
1.5

Favours Not Cooling
SPARC

Survival OR- Adjusted

Unadjusted
- Survival at 24
- Survival at 72
- Survival at D/C

Adjusted
- Survival at 24
- Survival at 72
- Survival at D/C

0.5  1.0  1.5
Favours Cooling  Favours Not Cooling
SPARC

Survival OR- Adjusted

Cooling may be Harmful

Unadjusted

Survival at 24
Survival at 72
Survival at D/C

Adjusted

Survival at 24
Survival at 72
Survival at D/C

0.5 1.0 1.5
Favours Cooling  Favours Not Cooling

St. Michael's
Inspired Care. Inspiring Science.

Medicine
UNIVERSITY OF TORONTO

rescu
What is different between eligible patients?

<table>
<thead>
<tr>
<th>Severity of Illness</th>
<th>Eligible and Cooled</th>
<th>Eligible and Not Cooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>472</td>
<td>301</td>
</tr>
<tr>
<td>GCS total - mean</td>
<td>3.77</td>
<td>3.79</td>
</tr>
<tr>
<td>GCS total - median</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>GCS total - min</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>GCS total - max</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Cardiovascular Co-Morbidity</td>
<td>49%</td>
<td>55%</td>
</tr>
<tr>
<td>Reperfusion</td>
<td>30%</td>
<td>18%</td>
</tr>
<tr>
<td>ICD</td>
<td>9%</td>
<td>4%</td>
</tr>
<tr>
<td>Vasopressors</td>
<td>59%</td>
<td>56%</td>
</tr>
<tr>
<td>mean motor score day 1</td>
<td>1.6</td>
<td>2.3</td>
</tr>
<tr>
<td>mean Motor score day 3</td>
<td>2.6</td>
<td>3.5</td>
</tr>
<tr>
<td>DNR or withdrawal of care&lt;24 hrs</td>
<td>4%</td>
<td>14%</td>
</tr>
<tr>
<td>DNR or withdrawal of care&lt;24 hrs - mean time</td>
<td>14</td>
<td>14.5</td>
</tr>
</tbody>
</table>
### How well did they cool?

<table>
<thead>
<tr>
<th>Cooling Parameters</th>
<th>Eligible for Cooling</th>
<th>%</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>cooling initiated</strong></td>
<td>773</td>
<td>61%</td>
<td>50%</td>
</tr>
<tr>
<td><strong>target reached within 6 hours</strong></td>
<td>472</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>mean duration</strong></td>
<td>191</td>
<td>41%</td>
<td>10%</td>
</tr>
<tr>
<td><strong>median duration</strong></td>
<td>21 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>shortest</strong></td>
<td>24 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>longest</strong></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>First IQR</strong></td>
<td>49 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Third IQR</strong></td>
<td>14 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Third IQR</strong></td>
<td>27 hrs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### How well did they cool?

<table>
<thead>
<tr>
<th>Cooling Parameters</th>
<th>Eligible for Cooling</th>
<th>%</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>773</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cooling initiated</td>
<td>472</td>
<td>61%</td>
<td>50%</td>
</tr>
<tr>
<td>target reached within 6 hours</td>
<td>191</td>
<td>41%</td>
<td>10%</td>
</tr>
<tr>
<td>mean duration</td>
<td>21 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>median duration</td>
<td>24 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>shortest</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>longest</td>
<td>49 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First IQR</td>
<td>14 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third IQR</td>
<td>27 hrs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How well did they cool?

<table>
<thead>
<tr>
<th>Cooling Parameters</th>
<th>Eligible for Cooling</th>
<th>%</th>
<th>Baseline</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>773</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cooling initiated</td>
<td>472</td>
<td>61%</td>
<td>50%</td>
</tr>
<tr>
<td>target reached within 6 hours</td>
<td>191</td>
<td>41%</td>
<td>10%</td>
</tr>
<tr>
<td>mean duration</td>
<td>21 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>median duration</td>
<td>24 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>shortest</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>longest</td>
<td>49 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First IQR</td>
<td>14 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third IQR</td>
<td>27 hrs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SPARC

Survival OR - Adjusted

Unadjusted

Survival at 24
Survival at 72
Survival at D/C

Adjusted

Survival at 24
Survival at 72
Survival at D/C

Favours Cooling
Favours Not Cooling

0.5  1.0  1.5
SPARC

Survival OR- Adjusted

Unadjusted
Survival at 24
Survival at 72
Survival at D/C

Adjusted
Survival at 24
Survival at 72
Survival at D/C

0.5  1.0  1.5
Favours Cooling  Favours Not Cooling
SPARC
Survival OR- Adjusted

Unadjusted
Survival at 24
Survival at 72
Survival at D/C

Adjusted
Survival at 24
Survival at 72
Survival at D/C

Cooling poorly may be Harmful

Favours Cooling
Favours Not Cooling

0.5 1.0 1.5

HARM
What is the Interpretation?
What is the Interpretation?

Cooling saves lives in real life with an NNT of 12
What is the Interpretation?

Cooling saves lives in real life with an NNT of 12

Cooling poorly does not have any added value over the Utstein predictors of outcome
What is the Interpretation?

Cooling saves lives in real life with an NNT of 12

Cooling poorly does not have any added value over the Utstein predictors of outcome

......and may in fact be harmful
What is the Interpretation?

Cooling saves lives in real life with an NNT of 12

Cooling poorly does not have any added value over the Utstein predictors of outcome

......and may in fact be harmful

Cooling poorly and not cooling eligible patients
What is the Interpretation?

Cooling saves lives in real life with an NNT of 12

Cooling poorly does not have any added value over the Utstein predictors of outcome

......and may in fact be harmful

Cooling poorly and not cooling eligible patients may drop institutional survival rates
What is the message?
What is the message?

*Knowledge Translation implementation strategies improve compliance with the guidelines*
What is the message?

Knowledge Translation implementation strategies improve compliance with the guidelines

Cool all eligible patients and
What is the message?

*Knowledge Translation implementation strategies improve compliance with the guidelines*

*Cool all eligible patients and if you cool,*
What is the message?

*Knowledge Translation implementation strategies improve compliance with the guidelines*

*Cool all eligible patients and if you cool, cool well.*
Post Cardiac Arrest Patient?

Stay Cool!

Consider Therapeutic Hypothermia for post cardiac arrest patients

www.sparcnetwork.ca
SPARC

Toronto Statistics (2010)

2.5 million people
1610 treated OHCA
6.3 min response
19% VT VF
37% Bystander CPR
2% PAD applied

778 CPR process files
- Mean rate 114 (17)
- Mean depth 4.2 cm (1)
- Mean comp fraction 0.67 (0.13)

Survival
- All rhythms 5.4%
- VF 22%
<table>
<thead>
<tr>
<th>Cooling Stats</th>
<th>2008</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>OHCA</td>
<td>1878</td>
<td>1946</td>
</tr>
<tr>
<td>Sustained ROSC</td>
<td>834</td>
<td>809</td>
</tr>
<tr>
<td>Eligible</td>
<td>508</td>
<td>497</td>
</tr>
<tr>
<td>Cooled</td>
<td>238 (47%)</td>
<td>240 (48%)</td>
</tr>
<tr>
<td>ED Cooled</td>
<td>120</td>
<td>114</td>
</tr>
<tr>
<td>ICU Cooled</td>
<td>94</td>
<td>88</td>
</tr>
<tr>
<td>Met Guidelines</td>
<td>64 (27%)</td>
<td>103 (42.9%)</td>
</tr>
<tr>
<td>Mean time to 34</td>
<td>5 ± 4</td>
<td>4 ± 4</td>
</tr>
<tr>
<td>Mean dur cooling</td>
<td>21 ± 39</td>
<td>19 ± 10</td>
</tr>
<tr>
<td>Safety</td>
<td>70 of 326</td>
<td>86 of 312</td>
</tr>
<tr>
<td>Post Arrest Care</td>
<td>2008</td>
<td>2009</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Eligible for Cooling</td>
<td>508</td>
<td>497</td>
</tr>
<tr>
<td>Fibrinolysis</td>
<td>35</td>
<td>28</td>
</tr>
<tr>
<td>Angiography</td>
<td>59</td>
<td>86</td>
</tr>
<tr>
<td>Balloon Angioplasty</td>
<td>40</td>
<td>33</td>
</tr>
<tr>
<td>ICD</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>Vasopressors</td>
<td>242</td>
<td>268</td>
</tr>
<tr>
<td>Sedatives</td>
<td>324</td>
<td>322</td>
</tr>
<tr>
<td>Paralytics</td>
<td>111</td>
<td>137</td>
</tr>
<tr>
<td>Neuroprognostics</td>
<td>2008</td>
<td>2009</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Eligible for Cooling</td>
<td>508</td>
<td>497</td>
</tr>
<tr>
<td>Alive at 72 hours</td>
<td>245</td>
<td>248</td>
</tr>
<tr>
<td>LSW after 6 hours in ED</td>
<td>188</td>
<td>180</td>
</tr>
<tr>
<td>Mean duration before LSW</td>
<td>4 days</td>
<td>4 days</td>
</tr>
<tr>
<td>DNR/LSW &lt;6 hrs in ED</td>
<td>182</td>
<td>177</td>
</tr>
</tbody>
</table>