Methods to Improve CPR Skills: Clinicians & Laypersons

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Disclosures

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ITMAT/CTSA CHIBE pilot grant (PI: Abella/Co-I: Blewer)
Objectives

Describe initiatives to improve CPR skills in clinicians
  - Feedback
  - Debriefing
  - Resuscitation Quality Improvement Program

Describe initiatives to improve CPR skills in laypersons
  - Dispatch-assisted CPR
  - Video Self-Instruction kits

Review current projects at the University of Pennsylvania
Real-time CPR-sensing and feedback technology modestly improved the quality of CPR during in-hospital cardiac arrest
Improving clinician CPR quality: feedback
Focused discussion after a cardiac arrest event in which individual actions and team performance are reviewed.
Improving clinician CPR quality: debriefing

Combination of RAPID and real-time audiovisual feedback improved CPR quality vs feedback alone

Edelson et al Arch Inter Med, 2008
Improving CPR quality among clinicians: debriefing

Meaney et al Circulation, 2013
Improving CPR quality clinicians: Refresher training

Refresher training improved CPR skills. Multiple sessions improved chest compressions compared to <2 times

Niles et al Resuscitation, 2009
Improving CPR quality clinicians: RQI

- eSimulation cases
- Mobile Simulation Stations
- Refreshes CPR skills
- Modules to develop high-quality CPR
- Allows providers to maintain course completion cards indefinitely
- Data archived in learning management system

http://cpr.heart.org/AHAECC/CPRAndECC/Training/RQI/UCM_476470_RQI.js
Improving layperson CPR quality
Improving CPR quality laypersons: dispatch-assisted CPR
Improving CPR quality laypersons: dispatch-assisted CPR

Assist communities and dispatch organizations by providing resources to improve the delivery of dispatch-assisted CPR

http://www.resuscitationacademy.org/
Improving CPR quality laypersons: dispatch-assisted CPR

Survival to hospital discharge and favorable functional outcome increased significantly from DCPR

Simulation studies demonstrate improved CPR quality
Improving CPR quality laypersons: VSI kits

AHA/Laerdal collaboration

Video Self Instruction (VSI)

20 minutes

Emphasis on hands-on practice time

DVD teaches Hands-only CPR (AHA 2015 Guidelines)
Standard VSI training includes the use of an inflatable practice manikin
Improving CPR quality laypersons: VSI kits

TRAINING AND EDUCATIONAL PAPER

Retention of CPR skills learned in a traditional AHA Heartsaver course versus 30-min video self-training: A controlled randomized study

Eric L. Einspruch, Bonnie Lynch, Tom P. Aufderheide, Graham Nichol, Lance Becker

Einspruch et al, Resus 2007

Simulation and education

Dissemination of CPR video self-instruction materials to secondary trainees: Results from a hospital-based CPR education trial

Daniel J. Ikeda, David G. Buckler, Jiaqi Li, Amit K. Agarwal, Laura J. Di Taranti, James Kurtz, Ryan dos Reis, Marion Leary, Benjamin S. Abella, Audrey L. Blewer

Ikeda et al, Resus 2016
CPR instruction is offered to family members of hospitalized cardiac patients by volunteers (staff nurses and students in the health sciences)

Recent projects at Penn: VSI Kits
What is the minimum amount of training required?

Big public health implications if no manikin required…

Recent projects at Penn: VSI Kits

Video-only vs Video-self instruction (VSI)

Primary outcome: chest compression rate and depth at 6 months
Recent projects at Penn: VSI Kits

Blewer et al, Circ Qual Outcomes 2016
Incorporation of the video on digital platforms

Can we incorporate the training video into an app?
Increased practice and communication

Can increased practice and communication improve CPR skills?
Can we incorporate increased prompting and communication to improve CPR skills?
Current project: VSI kit vs myCPRtrainer App

To compare CPR training with the video self-instruction kit to training via mobile app.

Project start date: January 2016
Primary outcome: compression rate and depth at 6 months
Secondary analyses: improving the pragmatic clinical trial infrastructure

(Funded through PCORI)
The Mission

• Reach the underserved communities of Philadelphia and teach them hands-only CPR.
• Increase bystander intervention for victims of Sudden Cardiac Arrest.
• Work with our community partners to achieve our goal of teaching 10,000 people CPR in 3 years.
Community Participants
## Demographics

**Project Duration:** June 2016 – December 2017  
**Number Trained:** 3693  
**Number Surveyed:** 2009

### Previous CPR Education

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count (%)</th>
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<tbody>
<tr>
<td>Never</td>
<td>953 (48.0%)</td>
</tr>
<tr>
<td>Greater than 10 years ago</td>
<td>299 (15.1%)</td>
</tr>
<tr>
<td>Within 5-10 years</td>
<td>174 (8.8%)</td>
</tr>
<tr>
<td>Within 2-5 years</td>
<td>218 (11.0%)</td>
</tr>
<tr>
<td>Within the last 2 years</td>
<td>340 (17.0%)</td>
</tr>
<tr>
<td>No Response</td>
<td>25 (1.2%)</td>
</tr>
<tr>
<td>Knowledge of an AED</td>
<td>1113 (57.3%)</td>
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### Race

<table>
<thead>
<tr>
<th>Race</th>
<th>Count (%)</th>
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<tbody>
<tr>
<td>Black</td>
<td>1014 (52.5%)</td>
</tr>
<tr>
<td>White</td>
<td>569 (29.3%)</td>
</tr>
<tr>
<td>Asian</td>
<td>117 (6.0%)</td>
</tr>
<tr>
<td>Native American</td>
<td>43 (2.2%)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>233 (12.0%)</td>
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<tr>
<td>Pacific Islanders</td>
<td>5 (0.3%)</td>
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<tr>
<td>Other/No Response</td>
<td>111 (5.6%)</td>
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### Education Level

<table>
<thead>
<tr>
<th>Level</th>
<th>Count (%)</th>
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<tbody>
<tr>
<td>Less than High School</td>
<td>351 (17.7%)</td>
</tr>
<tr>
<td>High School</td>
<td>432 (21.8%)</td>
</tr>
<tr>
<td>Some college</td>
<td>538 (27.1%)</td>
</tr>
<tr>
<td>Bachelors or higher</td>
<td>663 (33.4%)</td>
</tr>
<tr>
<td>No Response</td>
<td>25 (1.2%)</td>
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### Age – years

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<tr>
<th>Age</th>
<th>Count (%)</th>
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<tr>
<td>41.54 ± 20.59</td>
<td>2009</td>
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