Methods to Improve CPR Skills: Clinicians & Laypersons

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Disclosures

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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

Improving clinician CPR quality: feedback

CLINICAL PAPER

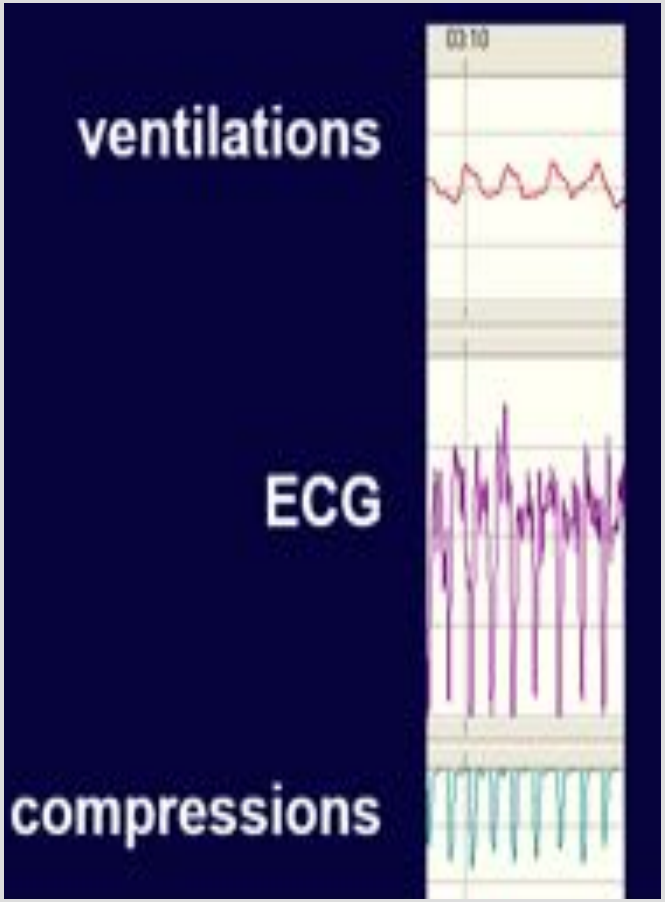
CPR quality improvement during in-hospital cardiac arrest using a real-time audiovisual feedback system☆

Benjamin S. Abella[a,*], Dana P. Edelson[b], Salem Kim[a], Elizabeth Retzer[c], Helge Myklebust[d], Anne M. Barry[c], Nicholas O'Hearn[e], Terry L. Vanden Hoek[c], Lance B. Becker[a]

Abella et al Resuscitation, 2007

Real-time CPR-sensing and feedback technology modestly improved the quality of CPR during in-hospital cardiac arrest

Improving clinician CPR quality: feedback



Improving clinician CPR quality: debriefing

Improving In-Hospital Cardiac Arrest Process and Outcomes With Performance Debriefing

Dana P. Edelson, MD, MS; Barbara Litzinger, BS; Vineet Arora, MD, MAPP; Deborah Walsh, MS, RN; Salem Kim, BA; Diane S. Lauderdale, PhD; Terry L. Vanden Hoek, MD; Lance B. Becker, MD, FAHA; Benjamin S. Abella, MD, MPhil

Edelson et al Arch Inter Med, 2008

Focused discussion after a cardiac arrest event in which individual actions and team performance are reviewed

Improving clinician CPR quality: debriefing

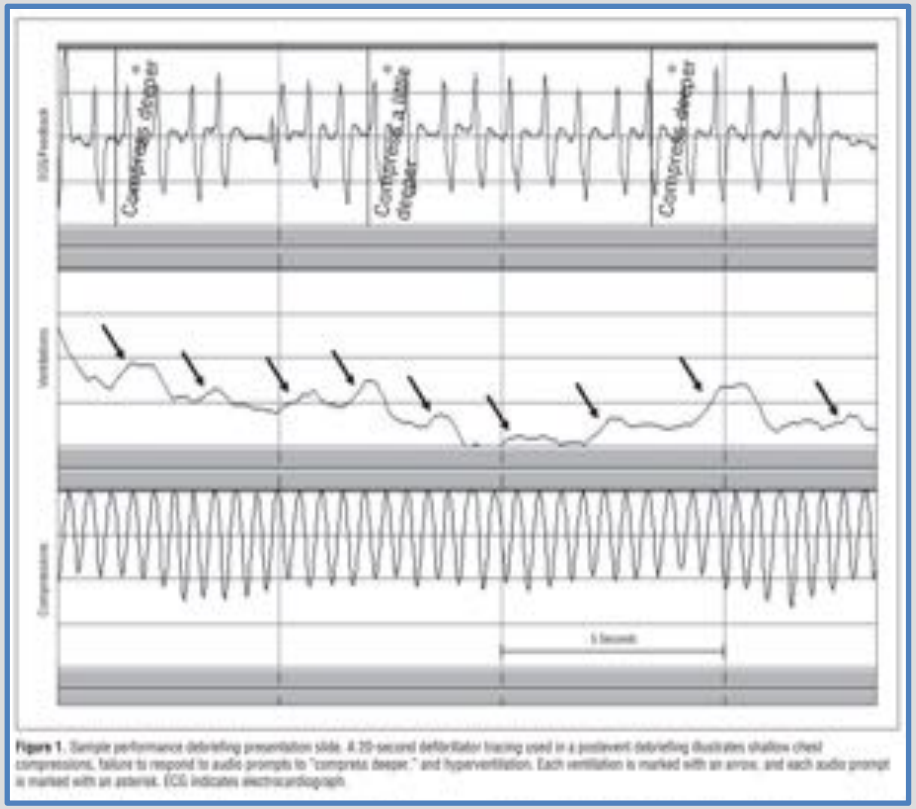


Figure 1. Sample performance debriefing presentation slide. A 20-second defibrillator tracing used in a postevent debriefing illustrates shallow chest compressions, failure to respond to audio prompts to "compress deeper," and hyperventilation. Each ventilation is marked with an arrow, and each audio prompt is marked with an asterisk. ECG indicates electrocardiograph.

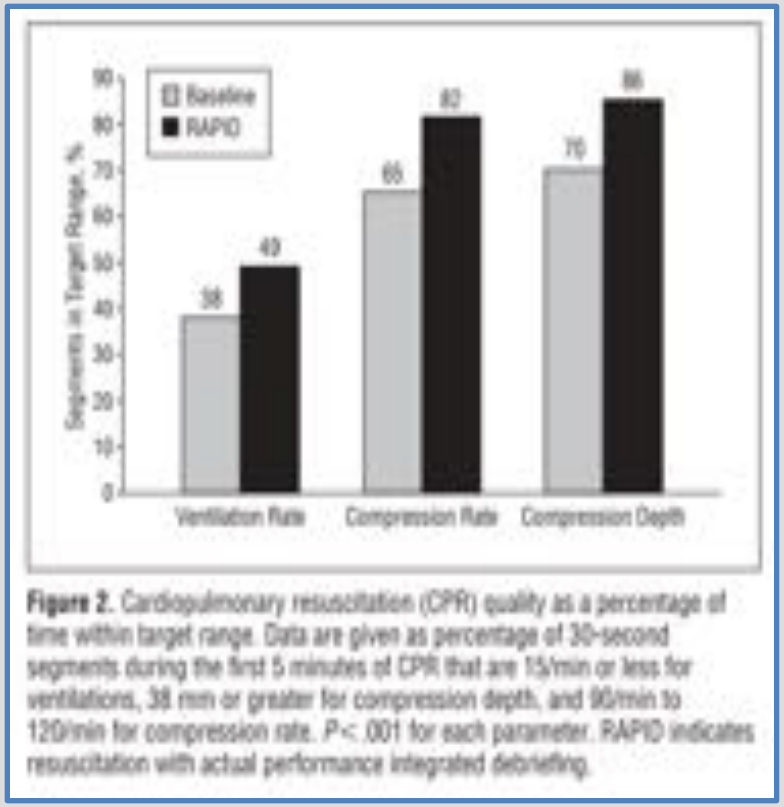
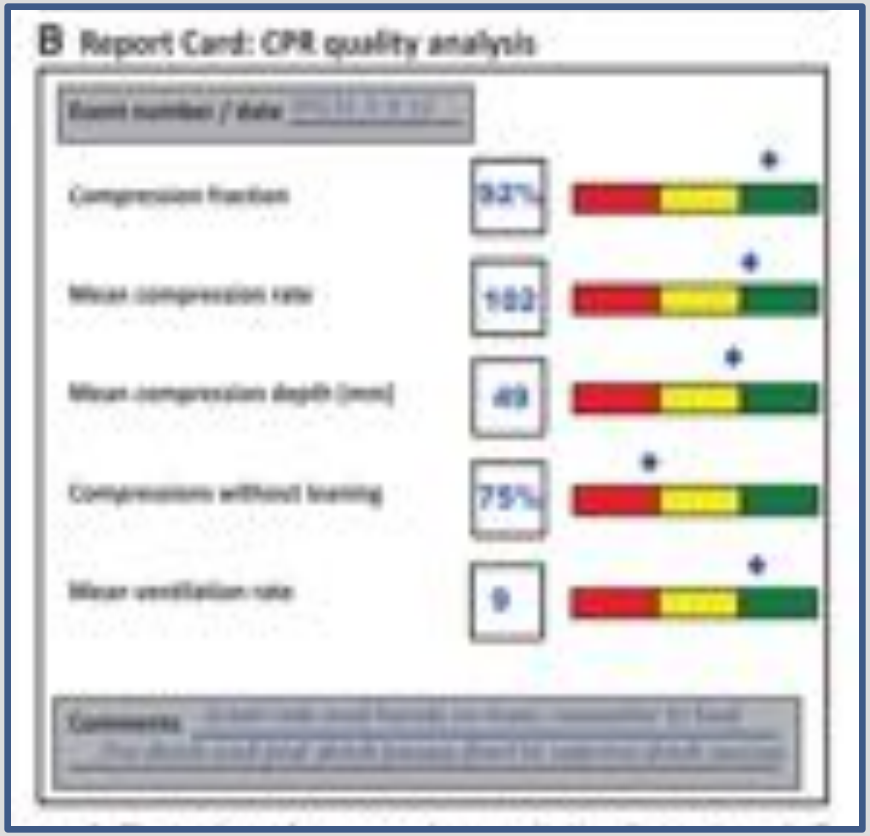


Figure 2. Cardiopulmonary resuscitation (CPR) quality as a percentage of time within target range. Data are given as percentage of 30-second segments during the first 5 minutes of CPR that are 15/min or less for ventilations, 38 mm or greater for compression depth, and 90/min to 120/min for compression rate. $P < .001$ for each parameter. RAPID indicates resuscitation with actual performance integrated debriefing.

Edelson et al Arch Inter Med, 2008

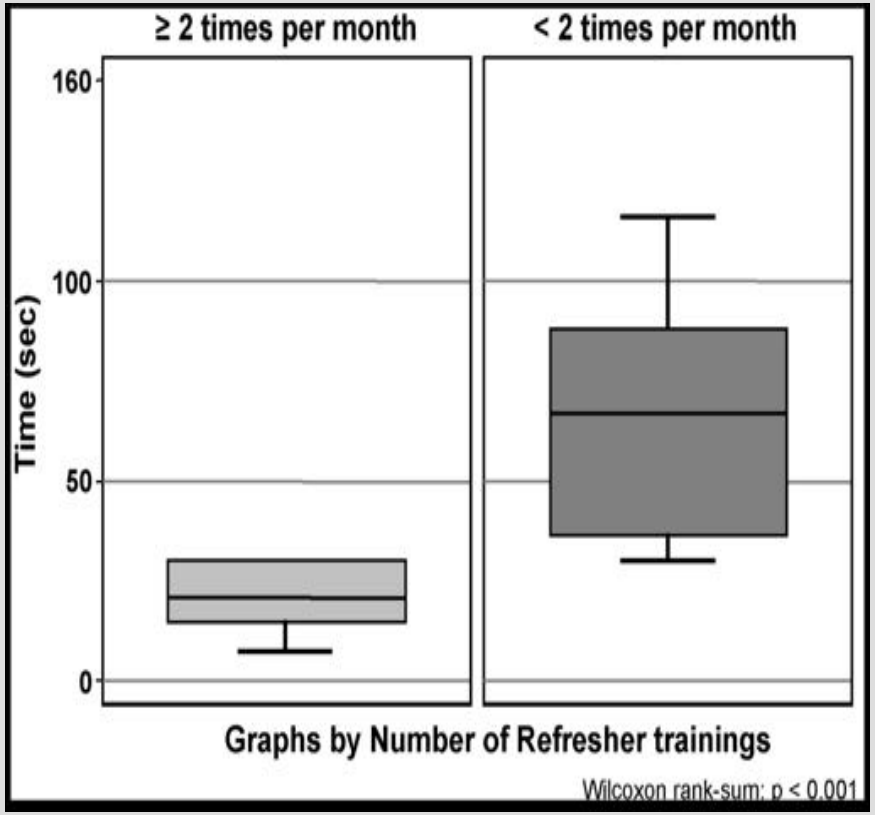
Combination of RAPID and real-time audiovisual feedback improved CPR quality vs feedback alone

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

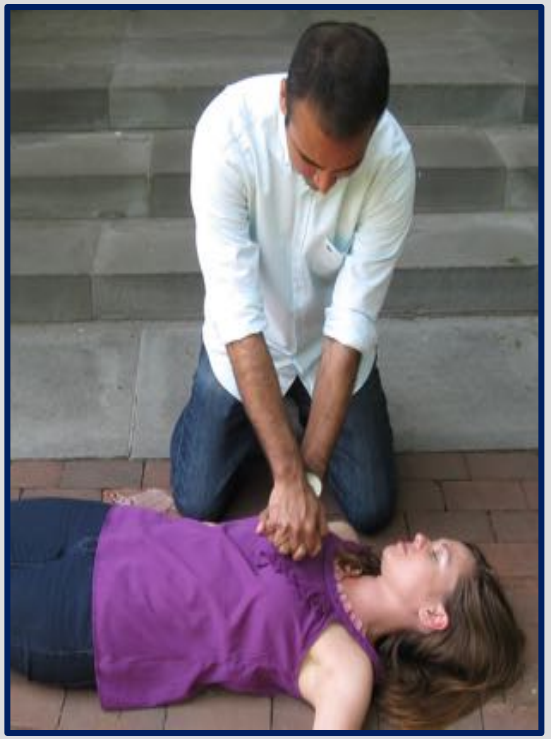
Improving CPR quality clinicians: RQI

- *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.jsp

Improving layperson CPR quality

Improving CPR quality laypersons: dispatch-assisted CPR



Improving CPR quality laypersons: dispatch-assisted CPR

RESUSCITATION ACADEMY

A foundation committed to improving cardiac arrest survival rates

http://www.resuscitationacademy.org/

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

Improving CPR quality laypersons: dispatch-assisted CPR

Table 4. Process Analysis

Variable	Phase[a] P1 (n = 738)	P2 (n = 1412)	*P* Value[b]
Telecommunicator knows TCPR indicated, No. (%)			
No	226 (30.6)	379 (26.8)	
Yes	509 (69.0)	1005 (71.2)	.11
Unknown	3 (0.4)	28 (2.0)	
TCPR instructions given, No. (%)			
No	368 (49.9)	612 (43.3)	
Yes	369 (50.0)	795 (56.3)	.005
Unknown	1 (0.1)	5 (0.4)	
Compressions started, No. (%)			
No	412 (55.8)	634 (44.9)	
Yes	321 (43.5)	746 (52.8)	<.001
Unknown	5 (0.7)	32 (2.3)	

Bobrow et al JAMA Cardiology, 2016

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[a,*], Bonnie Lynch[a], Tom P. Aufderheide[b], Graham Nichol[c], Lance Becker[d]

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[a], David G. Buckler[a], Jiaqi Li[a], Amit K. Agarwal[a], Laura J. Di Taranti[a], James Kurtz[d], Ryan dos Reis[d], Marion Leary[a,b], Benjamin S. Abella[a], Audrey L. Blewer[a,c,*]

Ikeda et al, Resus 2016

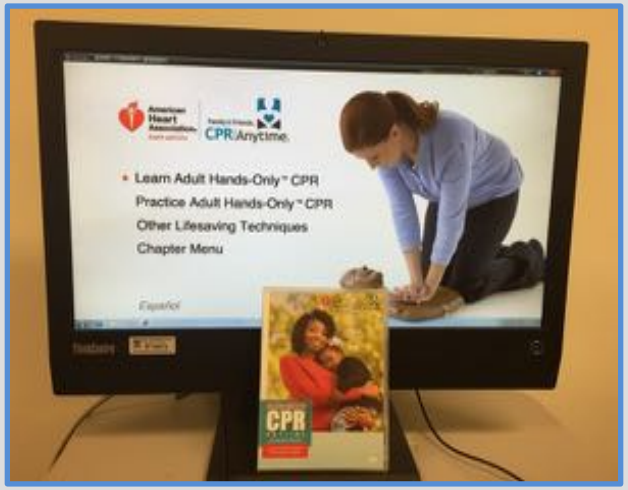
Recent projects at Penn: VSI Kits

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…



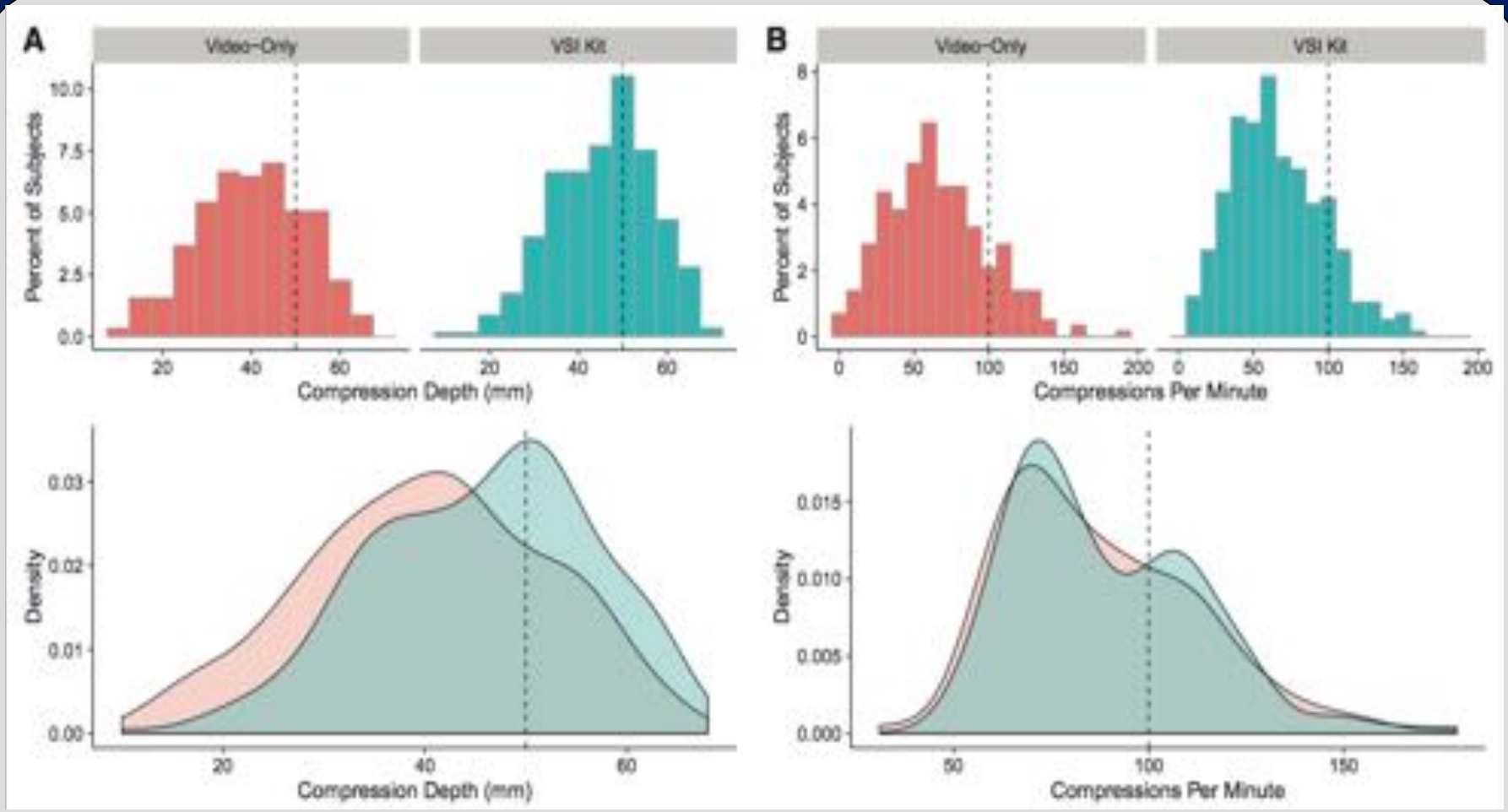
Video-only

vs

Video-self instruction (VSI)

Primary outcome: chest compression rate and depth at 6 months

Recent projects at Penn: VSI Kits

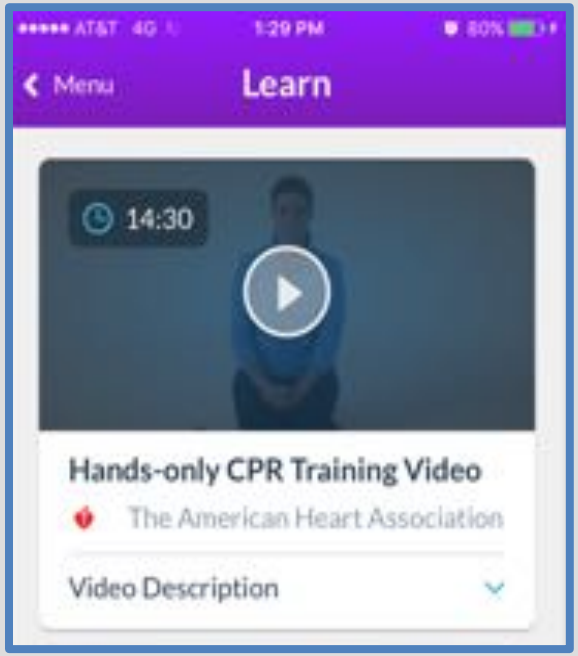


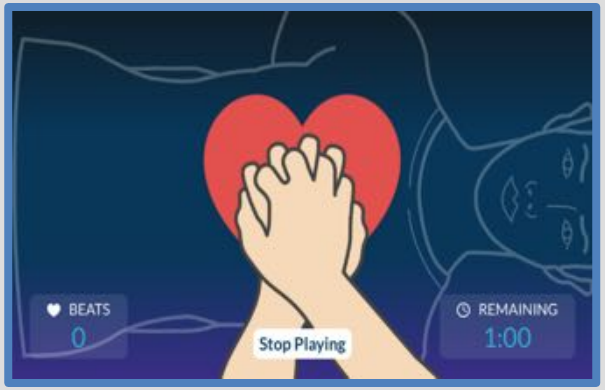
Blewer et al, Circ Qual Outcomes 2016

Incorporation of the video on digital platforms

Can we incorporate the training video into an app?

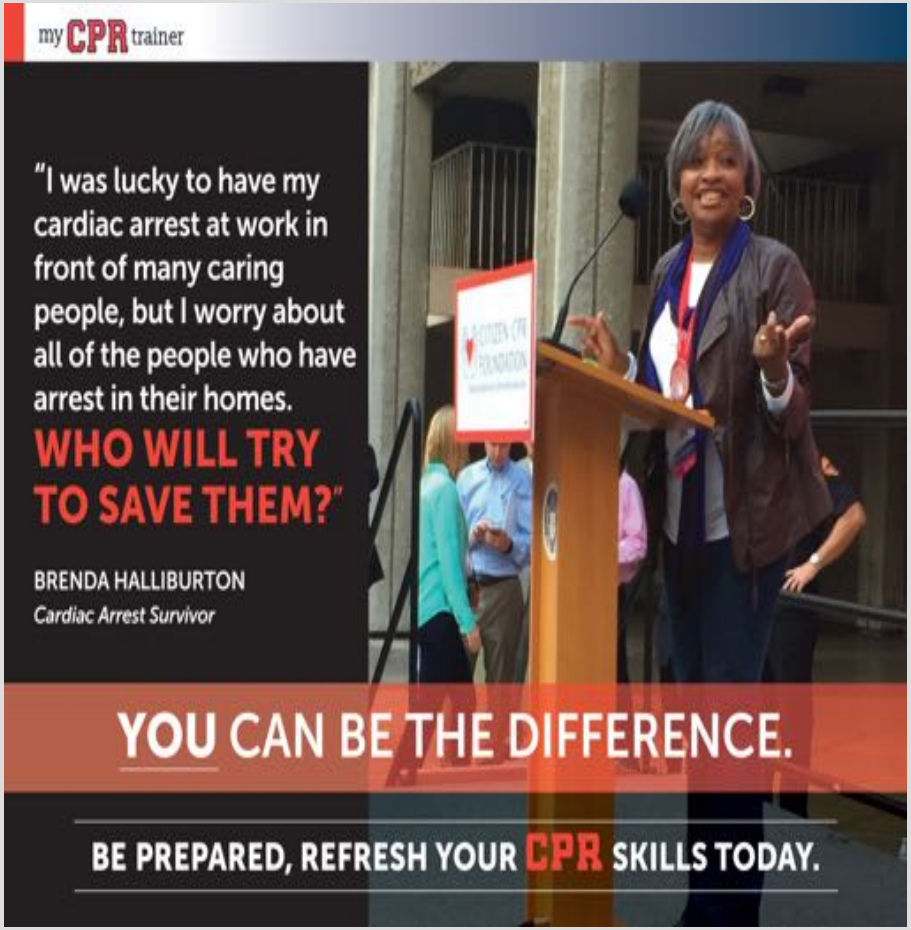
Increased practice and communication





Can increased practice and communication improve CPR skills?

Increased prompting and communication



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.

vs

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 MOBILE CPR PROJECT

PHILADELPHIA

Center for Resuscitation Science
Department of Emergency Medicine
Penn Medicine

INDEPENDENCE BLUE CROSS FOUNDATION
Independence

American Red Cross
Eastern Pennsylvania Region

American Heart Association | American Stroke Association
life is why

CPR Ready

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.

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CPR Ready

THE MOBILE CPR PROJECT PHILADELPHIA

Community Participants

Demographics

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

Previous CPR Education	
Never	953 (48.0%)
Greater than 10 years ago	299 (15.1%)
Within 5-10 years	174 (8.8%)
Within 2-5 years	218 (11.0%)
Within the last 2 years	340 (17.0%)
No Response	25 (1.2%)
Knowledge of an AED	1113 (57.3%)

Total Surveys Completed	2009
Age – years	41.54 (±20.59)
Female	1306 (67.4%)
Race	
Black	1014 (52.5%)
White	569 (29.3%)
Asian	117 (6.0 %)
Native American	43 (2.2%)
Hispanic/Latino	233 (12.0%)
Pacific Islanders	5 (0.3%)
Other/No Response	111 (5.6%)
Education Level	
Less than High School	351 (17.7%)
High School	432 (21.8%)
Some college	538 (27.1%)
Bachelors or higher	663 (33.4%)
No Response	25 (1.2%)

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