CPR Ready: Educating & Empowering To Improve Sudden Cardiac Arrest Survival in Philadelphia

JEFFERSON COLLEGE OF POPULATION HEALTH FORUM
Wednesday, November 9, 2016
Learning Objectives

• Highlight the public health impact of out-of-hospital cardiac arrest
• Describe the latest research on the effectiveness of hands-only cardiopulmonary resuscitation (CPR) compared to traditional CPR
• Summarize methods to improve the effectiveness and likelihood of bystander response to sudden cardiac arrest
• Provide an overview of various technology-driven solutions to increase bystander response
What is Cardiac Arrest?

- Occurs when the heart stops beating, abruptly and without warning
- Often a result of a rhythm disturbance called ventricular fibrillation
- Loss of pulse and consciousness in seconds; may have a brief seizure
- Is **not** a heart attack (a.k.a. myocardial infarction or “MI”)
- Commonly and incorrectly called a “massive heart attack”

**Heart Attack**
- Sudden blockage in coronary artery
- Person usually **conscious**
- Upper body discomfort or pain, shortness of breath, sweating

**Cardiac Arrest**
- Heart stops
- Person is **unconscious**
- Often no previous symptoms
- Person may be gasping or not be breathing at all
Each year over 359,000 cases of out-of-hospital cardiac arrest occur across the United States\(^1\).

Although survival rates vary considerably, overall survival is generally less than 10\(^%\)\(^2\).

That’s the equivalent of two Boeing 747 crashing each day of the year!

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\(^3\)Sudden Cardiac Arrest Foundation 2015
## Cardiac Arrest: Dispelling the Myth

<table>
<thead>
<tr>
<th>Stereotype</th>
<th>Reality</th>
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<tbody>
<tr>
<td><strong>Gender</strong></td>
<td>Male and Female</td>
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<tr>
<td><strong>Age</strong></td>
<td>Any Age</td>
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<tr>
<td><strong>Risk Factors</strong></td>
<td>No Known Risk Factors</td>
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<tr>
<td>Overweight</td>
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<td>Smoker</td>
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<td>High cholesterol</td>
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<td><strong>Medical History</strong></td>
<td>Often No Cardiac History</td>
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<tr>
<td>Heart Attack</td>
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<td><strong>Presenting Symptoms</strong></td>
<td>Often No Symptoms</td>
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<tr>
<td>Chest Pain</td>
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<tr>
<td>Dizziness</td>
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</table>
Cardiac Arrest: Patient Risk

Individual Patient Risk

- General Population
- High-risk for CAD
- Cardiac arrest survivor
- EF<30%, HF
- Prior Coronary event
- Arrhythmia risk/post-MI

Total # of CA cases/yr. in US

0% 5% 10% 15% 20% 25%

1Myerburg et al. JACC 2009;54:747-63
Cardiac Arrest: The Facts

- Of the 359,000 sudden cardiac arrest cases per year over three-quarters are out of the hospital and over 70 percent are in the home\(^1\).
- 7 of 10 Americans feel helpless to act during a cardiac emergency because they don’t know how to administer CPR or are afraid of hurting the victim. Yet most bystanders are fully capable of learning and performing CPR\(^1\).
- The age-adjusted incidence of out-of-hospital cardiac arrest per 10,000 adults is 10.1 among blacks, 6.5 among Hispanics, and 5.8 among whites\(^2\).
- In Philadelphia, the percentage of people who received bystander CPR in 2015 is 20.3 percent, compared with the national average of 40.6 percent\(^1\).
- Time is critical – chances of survival decrease 7-10% for every minute without bystander CPR.

\(^1\)American Heart Association 2016
Removing Barriers

• Barriers to bystander CPR include:
  ➢ Fear of causing harm
  ➢ Fear of contracting infectious disease
  ➢ Panic
  ➢ Complexity of the task/combinations
  ➢ Reluctance to make mouth-to-mouth contact

• To reduce some of these barriers, researchers set out to study whether compression-only or “Hands-Only” CPR (i.e. no rescue breaths) might be as effective as conventional CPR with rescue breaths

• **Spoiler Alert:** They discovered that rescue breathing wasn’t necessary in most situations because:
  ➢ Lungs are full of air
  ➢ Blood is full of oxygen
  ➢ Circulating the oxygenated blood is the key
What is CCO or Hands-Only CPR?

- Hands-Only CPR has just two easy steps: If you see a teen or adult suddenly collapse:
  1. Call 9-1-1; and
  2. Push hard and fast in the center of the chest to the beat of the disco song “Stayin’ Alive”, about 100 times per minute.

**NOTE:** Use of an automated external defibrillator (AED) will increase likelihood of survival
Multiple Studies Showed Equal or Superior Outcomes from Hands-Only CPR

SOS-Kanto study group. Cardiopulmonary resuscitation by bystanders with chest compression only (SOS-KANTO): an observational study. Lancet. 2007;369:920-6
Hands-Only CPR Improves Chance of Survival from Cardiac Arrest

Nagao, K  Current Opinions in Critical Care 2009
Bystander CPR in Arizona (2005 to 2010)
All out-of-hospital cardiac arrests

Survival to Hospital Discharge

- No CPR: 150/2,900 (5.2%)
- Traditional CPR: 52/666 (7.8%)
- Hands-Only CPR: 113/849 (13.3%)

1Rates are for all cardiac arrests; from Bobrow, et al. JAMA October 2010
Why might survival be better?

**Likely Reasons:**

- Simpler to remember than conventional CPR
- CPR is often started sooner
- Interruption of chest compressions stops blood flow to the brain
- Increased pressure in the chest decreases blood return to the heart

When to use Hands-Only Only CPR?

**Hands-Only CPR**
- Someone who unexpectedly collapses, and is unresponsive
- Adults and children over 8
- A person exhibiting agonal breathing and is unconscious

**Traditional CPR (30:2)**
- Obvious Breathing Problems:
  - Drowning
  - Choking
  - Drug overdoses
- Children less than 8
- Electrocution
- Blunt trauma

**WHEN IN DOUBT, DO COMPRESSIONS!!**
Education and Empowerment

- Need to get the word out about Hands-Only CPR and AED use
- Start ‘em young! CPR and AED implementation in school programs (e.g. Youth Heart Watch’s Heart Safe Schools):
  - Free school consultation
  - Training grants
  - CPR/AED education
  - Accessible AEDs
  - Emergency response plan
  - Drills
  - Integration into curriculum
- Present in 60% of U.S. high schools
- PA school survey of AEDs is underway
- Getting AEDs for schools and athletic fields
Motivation and Intention

- In September 2016, AHA published recommendations that set standards for timely and high quality delivery of dispatcher-assisted CPR, also known as telephone CPR (T-CPR).
- Use of “assertive CPR instruction” aims to reduce fear and motivate citizens to action.
- Studies have shown that “intention-focused” instruction can target the determinants of lay bystanders decision-making and thereby increase the likelihood of CPR performance.

<table>
<thead>
<tr>
<th>BARRIER</th>
<th>TACTIC</th>
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<tbody>
<tr>
<td>1 Bystander panicked, making CPR instruction</td>
<td>Use confidence and assertiveness to take control of situation</td>
</tr>
<tr>
<td>problematic</td>
<td></td>
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<tr>
<td>2 Bystander squeamish about M-T- M contact</td>
<td>Provide compression-only instructions</td>
</tr>
<tr>
<td>3 Bystander fears legal ramification</td>
<td>Assure bystander of Good Samaritan laws safeguarding citizen action</td>
</tr>
<tr>
<td>4 Bystander fearful of hurting the patient in</td>
<td>TELL bystander he MUST Engage help if multiple rescuers present. Use pillows.</td>
</tr>
<tr>
<td>getting them to a the floor.</td>
<td></td>
</tr>
<tr>
<td>5 Bystander fears CPR will hurt patient</td>
<td>Assure bystander that CPR is safe and won’t hurt patient</td>
</tr>
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Source: Save Hearts in Arizona Registry & Education (AZ SHARE)

1Panchal et al; 88 Resuscitation 2015
2Moon et al; AJEM, 2014; Sasson et al; NEJM 2012

- Disparities in training, knowledge and bystander CPR rates exist across geographies, neighborhoods and racial and ethnic groups.
The PulsePoint mobile app alerts CPR-trained bystanders to someone nearby having a sudden cardiac arrest that may require CPR. The app is activated by the local public safety communications center simultaneous with the dispatch of local fire and EMS resources.

Aims to reducing collapse-to-CPR times by increasing citizen awareness of cardiac events beyond a traditional “witnessed” area.

Reducing collapse-to-defibrillation times by increasing awareness of public access defibrillator (AED) locations through real-time mapping of nearby devices.

The app is only activated if the event is occurring in a public place (the app is not activated for residential addresses).
Crowdsourcing is a great way to collect lifesaving AED location information. Applying game mechanics and game design techniques to engage and motivate citizens to become more mindful of AEDs in their community. Gamification includes the concepts of contests, achievements and leaderboards for tasks such as adding AEDs or demonstrating knowledge of AED use.
The Ambulance Drone delivers AEDs directly to victims based on dispatcher reporter address or GPS location. The drones use a two-way, video supported, communication channel which allows them to communicate with the responder.
**CPR Ready Campaign**

- **CPR Ready** is a 3-year, multi-stakeholder regional effort which aims to improve outcomes of individuals suffering out-of-hospital cardiac arrest by coordinating, energizing, and expanding existing resuscitative resources and programs.

- The campaign was launched in June by the Philadelphia Regional CPR Awareness Coalition which was initially made up of the following organizations:
Setting Goals and Targets

• The CPR Ready campaign has three specific goals:
  1. **Double** the number of people trained in CPR/AED in the Philadelphia region
  2. **Triple** the bystander response rate from 20.3% (Philadelphia County) to 60%
  3. Ensure CPR/AED education is taught in at **least half** of the middle and high schools by 2019, with a longer term goal of having CPR/AED education and AEDs in all of middle and high schools

• The Coalition is embracing an inclusive, coordinated approach – we are looking additional partners, supporters and sponsors!

• HCIF, a local non-profit with a strong reputation for leadership of large-scale collaborative initiatives, was selected to assist in managing the project with an initial commitment through June 2019
• Need to establish baselines and begin tracking progress
• **Training**: Estimate number of people trained in the region
• **Bystander response**: Use of CARES registry to track bystander response rates
• **School and community**: Monitor changes in school curricula and # of CPR training programs

• CPR Ready plans to leverage an American Heart Association tracking tool to capture data on where, when and who provided training to align with national AHA 2020 campaign
• Will allow us to tracking training events and # of CPR trained individuals
• Will be rolled out to the CPRReadyPHL.org website
Are You CPR READY?
Individual contributions to the CPR Ready Campaign can be directed through United Way giving using donor number #14594.

Please remind employees, colleagues, friends and family about supporting CPR awareness and training in our region!