CPR DISPATCH ACADEMY
- THE SCIENCE OF CPR
- ROLE OF 9-1-1 PERSONNEL IN THE CHAIN OF SURVIVAL
- KEY ELEMENTS FOR SAVING LIVES
- SMALL GROUP TRAINING
Telephone-Assisted CPR: Maximizing Survival from Sudden Cardiac Arrest in Arizona
Goals

- Why is CPR so important?
- How can we assure survival is the “normal” outcome?
- How do we work together to make this a reality?
Leading Causes of Death in U.S in 2007


![Bar chart showing leading causes of death in the U.S. in 2007. The chart compares the annual number of deaths across various disorders, with Neoplasm having the highest number, followed by Other Cardiac, Cerebrovascular, Chronic Lower Resp, Unintentional Injury, Alzheimer, Diabetes, Influenza/Pneumonia, Renal, and Sepsis.]
Over 4 X Cardinal’s Stadium Every Year
Out-of-Hospital Cardiac Arrest is a Major Public Health Problem!
OHCA is also a HUGE EMS Problem

- Critical EMS function
- Quantifiable EMS function
- Test of entire EMSS
- Surrogate marker for success of EMS
- We can save lives!
So how do we do?
Enormous Regional Variations in Survival After OHCA

Nichol JAMA 2008

500% difference in survival
Micah’s slide

• Start with a fumbling call``

• Contrast with good call Seattle
The cardiac arrest problem

- Arrest
- CPR
- Return of Pulse
- Hospital Discharge

5-8%

Bystander CPR
Telephone CPR

Time

% Surviving
Time is Critical

Survival decreases by **10%** for every minute treatment is delayed.
Bystander CPR Improves Chance of Survival

Survival (%)

Time between collapse and defibrillation (min)

Nagao, K. Current Opinions in Critical Care 2009

- 2% each minute in patients receiving chest compression-only CPR
- 3% to 4% each minute in patients receiving Conventional CPR
- 7% to 10% each minute in patients receiving no CPR
Response Times to Medical Calls
2010, in Glendale

<table>
<thead>
<tr>
<th>90% of Medical Responses:</th>
<th>NFPA Goal</th>
<th>GFD Objective</th>
<th>Actual Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Safety Answering Point</td>
<td>-</td>
<td>0:30</td>
<td>0:26</td>
</tr>
<tr>
<td>Phoenix Call Handling</td>
<td>-</td>
<td>2:00</td>
<td>2:03</td>
</tr>
<tr>
<td>Notify to En route (turnout)</td>
<td>1:00</td>
<td>1:40</td>
<td>1:30*</td>
</tr>
<tr>
<td>En route to Arrive (travel)</td>
<td>4:00</td>
<td>6:00</td>
<td>5:29*</td>
</tr>
</tbody>
</table>

Total Response Time
5:00       10:10       9:28

*in Fire Department’s ability to control
Cumulative Response Timeline
2010 in Glendale

With brain death occurring after only 4 minutes without CPR intervention, the patient is already dying when the engine leaves the station.
Sudden Cardiac Arrest

What is it?
Sudden Cardiac Arrest

- Sudden loss of heart function
- Many due to ventricular fibrillation (abnormal heart rhythm)
- Commonly due to blocked heart artery
Some Causes of Cardiac Arrest

- Myocardial Infarction (Heart Attack)
- Arrhythmias (Can be Congenital)
- Respiratory arrest (ie., Asthma, FB)
- Drowning
- Overdose
- Severe allergic reaction
- Other
Cardiac Arrest

• What does it look like?
Signs of Cardiac Arrest

- Sudden, unexpected collapse
- Unconsciousness, NO sign of life
- Abnormal breathing (gasping) common
- Brief seizure - lack of oxygen to brain
Factors Contributing to Survival

- Two Critical Elements to Survival:
  1) Time from collapse to initiation of CPR
  2) Time from collapse to application of AED
What *REALLY* Matters When Cardiac Arrest Strikes?

Brain – Heart – Brain – Heart – Brain – Heart – Brain – Heart – Brain – Heart - Brain - Heart
Video
• What we need to maximize chance of survival?
System of Care

Measurement

Public

EMS

Hospital
SHARE Program
Statewide OHCA Network

Municipal FDs
University Research
Public Health
Private Ambulance
Local Hospitals
Private Industry
Public Safety Officers
Public
Welcome to S.H.A.R.E.
Save Hearts in Arizona Registry & Education

Read about EPIC, the Excellence in Prehospital Injury Care - Traumatic Brain Injury Project.
Attention Student Video Contest-Prizes! DEADLINE EXTENDED!

Learn Hands-Only CPR. It's easy and it's safe. Be a lifesaver today!
Hands-Only CPR Video

Attend a free (non-certification) Hands-Only CPR training class.
Hands-Only CPR Class

Register your AED with SHARE, report AED use, and learn AED FAQs.
Find AED Information

Learn more about cardiac arrest care. Check out our published papers.
Published Papers

SHARE Program

Would you know what to do if an adult suddenly collapses and is unresponsive? The Arizona Department of Health Services Bureau of Emergency Medical Services & Trauma System and the University of Arizona Banner Heart Center want your answer to always be YES! That's why they have established the SHARE Program.

The SHARE Program promotes a comprehensive, standardized system of out-of-hospital cardiac arrest care throughout Arizona encompassing all “links” in the “chain of survival”—bystander response, emergency medical dispatcher CPR instruction, Emergency Medical Services provider resuscitation, and standardized care at hospitals. SHARE also seeks to support survivors of out-of-hospital cardiac arrest by providing them with helpful resources.

SHARE has partnered with many groups to collect and analyze data related to all aspects of out-of-hospital cardiac arrest care. We collect information on Hands-Only CPR training, Automated External Defibrillator (AED) uses, EMS response, and hospital treatments. Our partners include agencies and organizations within our state, as well as national groups such as the American Heart Association. Working together we promote evidence-based treatment and improve survival from out-of-hospital cardiac arrest.

Note: Files indicated as PDF require Adobe Acrobat Reader™ to view.
OHCA Survival in Arizona

“With so few survivors, we felt compelled to make modifications to protocol based upon current evidence and track the results closely.”

Bobrow et al, Prehospital Emergency Care 2008;12:381-387
Minimally Interrupted Cardiac Resuscitation

Survival to Hospital Discharge (%)

- ALS
- CCR

- OR, 3.4 (95% CI, 2.0-5.8) (36/128)
- OR, 2.7 (95% CI, 1.9-4.1) (33/348)
- (61/1686)
- (55/598)
- 3.6
- 9.2
- 28.1
- 10.9

All cardiac arrests
Witnessed with VF

SHARE JAMA 2008
Results

Initial EMS Rhythm

Survival to Discharge

- All rhythms
- Shockable
- Non-shockable
- Witnessed VF

OR: 2.110 [1.312-3.395]
OR: 2.629 [1.225 to 5.642]
OR: 3.098 [1.259-7.624]
OR: 1.569 [0.514-4.794]

SHARE SAEM 2009
Great Importance of Bystander CPR

The OR for Bystander CPR was 2.44 (95% CI, 1.69-3.19)

(Sasson et. al. Circulation: Cardiovascular Quality and Outcomes Nov. 2009.)
Should we institute Dispatcher Assisted CPR?
Bystander CPR Rates

- 32% New York (Gallagher, 1995)
- 21% Detroit (Swor, 1995)
- 15% Ontario, Canada (Stiell, 2004)
- 19% Europe, (Wenzel, 2004)
- 28% SOS KANTO (Nagao, 2007)
- 27% Osaka, Japan (Iwami, 2007)
- 25% Singapore (Ong, 2008)
- 25% CARES Registry (McNally, 2009)
- 25% Arizona SHARE (Vadeboncoeur, 2007)
Obstacles to Bystander CPR

- Panic
- Fear of causing harm
- False Teeth
- Can’t get person to the floor
- Reluctant bystander
- Aversion to MTM breathing
- Fear of infection
- Can you think of any others?
A Heart A Hand
Hands-Only CPR
22 Minutes
Lend A Heart A Hand
Hands-Only CPR
22 Minutes
New CPR developed here.
Be a Lifesaver.
Learn Continuous Chest Compression CPR.

626-4083
Brief PSAs with Governor and Celebs
Bystander CPR: Incidence and Type

SHARE - JAMA 2010; Oct

28.2%  39.9%  42.7%
2005  2006  2007  2008  2009  2010

41.5% relative increase
P = 0.001
Bystander CPR for OHCA in Arizona (2005 to 2010)

Witnessed/Shockable OHCA

Survival to Hospital Discharge

- None: 17.6%
- CPR: 17.7%
- COCPR: 33.7%

Bobrow, Spate, Ewy et al. submitted JAMA 2010
Enormous Regional Variations in Survival After OHCA

Nichol JAMA 2008

500% difference in survival
What is the Secret Sauce?
Dispatcher-Assisted Cardiopulmonary Resuscitation and Survival in Cardiac Arrest

Thomas D. Rea, MD, MPH; Mickey S. Eisenberg, MD, PhD; Linda L. Culley, BA; Linda Becker, MA

Background—Early cardiopulmonary resuscitation (CPR) improves survival in out-of-hospital cardiac arrest, and dispatcher-delivered instruction in CPR can increase the proportion of arrest victims who receive bystander CPR before emergency medical service (EMS) arrival. However, little is known about the survival effectiveness of dispatcher-delivered telephone CPR instruction.

Methods and Results—We evaluated a population-based cohort of EMS-attended adult cardiac arrests (n=7265) from 1983 through 2000 in King County, Washington, to assess the association between survival to hospital discharge and 3 distinct CPR groups: no bystander CPR before EMS arrival (no bystander CPR), bystander CPR before EMS arrival requiring dispatcher instruction (dispatcher-assisted bystander CPR), and bystander CPR before EMS arrival not requiring dispatcher instruction (bystander CPR without dispatcher assistance). In this cohort, 44.1% received no bystander CPR before EMS arrival, 25.7% received dispatcher-assisted bystander CPR, and 30.2% received bystander CPR without dispatcher assistance. Overall survival was 15.3%. Using no bystander CPR as the reference group, the multivariate adjusted odds ratio of survival was 1.45 (95% confidence interval [CI], 1.21, 1.73) for dispatcher-assisted bystander CPR and 1.69 (95% CI, 1.42, 2.01) for bystander CPR without dispatcher assistance.

Conclusion—Dispatcher-assisted bystander CPR seems to increase survival in cardiac arrest. (Circulation. 2001;104: 2513-2516.)

Key Words: heart arrest ■ cardiopulmonary resuscitation ■ arrhythmia ■ resuscitation ■ death, sudden
Bystander CPR

BCPR- King County, WA *with* Dispatch

BCPR- King County, WA *without* Dispatch

Arizona

0% 20% 40% 60% 80% 100%

2005 2006 2007 2008 2009 2010

SHARE - JAMA 2010; Oct
Dispatcher-Assisted Telephone CPR

- Starting CPR within minutes after collapse is **critical**

- *Therefore, dispatcher-assisted CPR must be provided*

- “EMS dispatch has an **enormous opportunity** to provide lifesaving CPR instructions to the public”
Dispatch Assisted CPR

More Bystander CPR

More Survivors
Dispatch Assisted CPR

Because dispatcher CPR instructions substantially increase the likelihood of bystander CPR performance and improve survival from cardiac arrest, ALL dispatchers should be appropriately trained to provide telephone CPR instructions (Class I, LOE B).

2010 AHA Guidelines
“Just-in-time education in the form of telephone CPR instructions, referred to as CPR prearrival instructions, can provide callers with step-by-step instructions on how to perform CPR. Unfortunately, prearrival instructions are not available to all callers who access the 9-1-1.”
The Key Points to Dispatch-Assisted CPR

- Identify cardiac arrest *early* in the call
- Don’t be afraid to *start* CPR (little risk of harm)
- Be *assertive* – “were going to do CPR, I’ll help you”
- Be *confident* with instructions
- Effective CPR coaching to caller – rate, depth, continue
2-Question Approach

Is the patient responsive/conscious?
- Yes: Consider alternate conditions
- No: Repeat questioning

Is the patient breathing normally?
- Yes: Consider alternate conditions
- No: Repeat questioning

Possible Cardiac Arrest
START CPR
Breathing
How to ask the question:

- If unsure about breathing *normally*, interrogate further:
  - Does the patient’s chest rise & fall *normally*?
  - Describe the patient’s breathing
  - Listen for sounds & frequency of breaths
  - Place phone next to victim
How do I Instruct Hands-Only CPR?

**Get the victim on the floor**
- **Kneel** beside him/her
- Place **one hand on top** of the **other**
- **Lock** your **elbows**
- Aim for the **middle** of the **chest**
- **Push hard** and **fast**
  - At least **100 compressions per minute**
  - Need to push at least 2 inches each compression & let chest rise
  - No stopping, switch rescuers if you think they are tiring
CPR or No CPR?
Dispatcher-Assisted Cardiopulmonary Resuscitation

Risks for Patients Not in Cardiac Arrest

Lindsay White, MPH; Joseph Rogers, MS; Megan Bloomingdale; Carol Fahrenbruch, MSPH; Linda Culley, BA; Cleo Subido, RPL; Mickey Eisenberg, MD, PhD; Thomas Rea, MD, MPH

Background—Dispatcher-assisted cardiopulmonary resuscitation (CPR) instructions can increase bystander CPR and thereby increase the rate of survival from cardiac arrest. The risk of bystander CPR for patients not in arrest is uncertain and has implications for how assertive dispatch is in instructing CPR. We determined the frequency of dispatcher-assisted CPR for patients not in arrest and the frequency and severity of injury related to chest compressions.

Methods and Results—The investigation was a prospective cohort study of adult patients not in cardiac arrest for whom dispatchers provided CPR instructions in King County, Washington, between June 1, 2004, and January 31, 2007. The study focused on those who received chest compressions. Information was collected through review of the audio and written dispatch report, written emergency medical services report, hospital record, and telephone survey. Of the 1700 patients for whom dispatcher CPR instructions were initiated, 55% (938 of 1700) were in arrest, 45% (762 of 1700) were not in arrest, and 18% (313 of 1700) were not in arrest and received bystander chest compressions. Of the 247 not in arrest who received chest compressions and had complete outcome ascertainment, 12% (29 of 247) experienced discomfort, and 2% (6 of 247) sustained injuries likely or possibly caused by bystander CPR. Only 2% (5 of 247) suffered a fracture, and no patients suffered visceral organ injury.

Conclusions—In this prospective study, the frequency of serious injury related to dispatcher-assisted bystander CPR among nonarrest patients was low. When coupled with the established benefits of bystander CPR among those with arrest, these results support an assertive program of dispatcher-assisted CPR. (Circulation. 2010;121:91-97.)

Key Words: cardiopulmonary resuscitation • complications • dispatcher • epidemiology • morbidity
DA-CPR Program Goal

1. All 911 callers in Arizona aiding a cardiac arrest victim receive clear, immediate type appropriate CPR instructions.

2. This intervention is accurately measured, benchmarked and becomes the culture of the your Dispatch Center and then across dispatch centers in Arizona.
Program Goal

• To facilitate change in 9-1-1 dispatch centers in Arizona and develop a culture of measurement and continuous quality improvement of this critical intervention.
Measurement and Evaluation

DA-CPR will be measured by:

1. Tracking 9-1-1 centers trained
2. Tracking 9-1-1 call takers trained
3. Tracking DA-CPR at 9-1-1 centers
4. Audit of 9-1-1 calls with feedback to centers
5. Continuing to measure bystander CPR rates
6. Continuing to measure survival rates
You cannot improve what you can’t measure!

Resuscitation systems should institute CQI processes to track the incidence and outcomes from cardiac arrest.

– 2010 ECC & CPR Guidelines
Measurement is Key

- Cardiac Arrest Identified?
- Appropriate Instructions Given
- Time to Cardiac Arrest ID
- Time to First Chest Compression
What we will do

Update all dispatchers with new Guidelines
   – Online pre-training
      • This video, protocols, reference material
   – Live training with simulated calls
   – Online post-training resources
   – Ongoing refresher training

Establish on-going QI process
   - review all CPR calls
   - provide regular feedback for dispatchers
   - measure frequency, quality, and time intervals for CPR instruction process
   - measure impact on bystander CPR rates and survival
We Can Do It!
CPR DISPATCH ACADEMY
Friday, December 2, 2011

SESSIONS INCLUDE
- THE SCIENCE OF CPR
- ROLE OF 9-1-1 PERSONNEL IN THE CHAIN OF SURVIVAL
- KEY ELEMENTS FOR SAVING LIVES
- SMALL GROUP TRAINING

WHO: Emergency dispatchers and 9-1-1 call takers
WHAT: A dynamic, hands-on workshop exploring telephone-assisted CPR, a tool to TRIPLE the odds of survival for victims of sudden cardiac arrest. Good for EMT CE credits
WHEN: 0800-1600 Friday, December 2, 2011 (Lunch provided)
WHERE: The Arizona State Laboratory
250 N. 17th Avenue, Phoenix, AZ 85007

SPACE IS LIMITED!
TUITION IS FREE!

Visit dispatchacademy.eventbrite.com to register
Thank you
On Behalf of the SHARE Team
www.azshare.gov

Acknowledgement

We are sincerely grateful for the dedication and the sacrifices that the paramedics & firefighters make daily in the line of duty.