EMD CPR

"The First First Responder"

R. Darrell Nelson, MD, FACEP

Emergency Medicine
Wake Forest University Baptist Health
Medical Director, Davie and Stokes County EMS
Assistant Medical Director, Forsyth County EMS

“The First, First Responder”

- Objectives
  - 1. Why does EMD matter?
  - 2. Review Science of CPR
  - 3. Review Role of EMD as Key Part
  - 4. Agonal Respirations
  - 4. Review Barriers to Bystander CPR

"The First, First Responder"

- Conflicts of Interest / Financial Disclosers
  - Sadly, I have no financial or industrial conflicts of interest to disclose.

Why does EMD matter in CPR?

- How long can brain cells survive following cardiac arrest?

- How long before First Responders arrive?

“The First, First Responder”

- Time from collapse to CPR critical
- PAI CPR decreases this time interval
- Goal for CPR initiation is?
  - 1 minute
- US average response time 4 – 6 minutes
- Average response time for ALS in US?
  - 8 – 12 minutes

TIME IS CRITICAL

Survival decreases by 10% for every minute treatment is delayed

Adult Chain of Survival

1. Immediate recognition of cardiac arrest and activation of the emergency response system
2. Early CPR with an emphasis on chest compressions
3. Rapid defibrillation
4. Effective advanced life support
5. Integrated post–cardiac arrest care

How many links with EMD?

1 2 3

1. Immediate recognition of cardiac arrest and activation of the emergency response system
2. Early CPR with an emphasis on chest compressions
3. Rapid defibrillation

Frequently Asked Questions

- Can I harm the patient?
- Should dispatcher's be trained in CPR?
- Caller doesn’t want to perform CPR?
- Caller knows CPR and is doing it?
- Dispatcher feels bad if person dies?
- Cannot get patient into position for CPR?
- Most die, why all the work?

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Cardiopulmonary Resuscitation

LETS GET RE-EXCITED

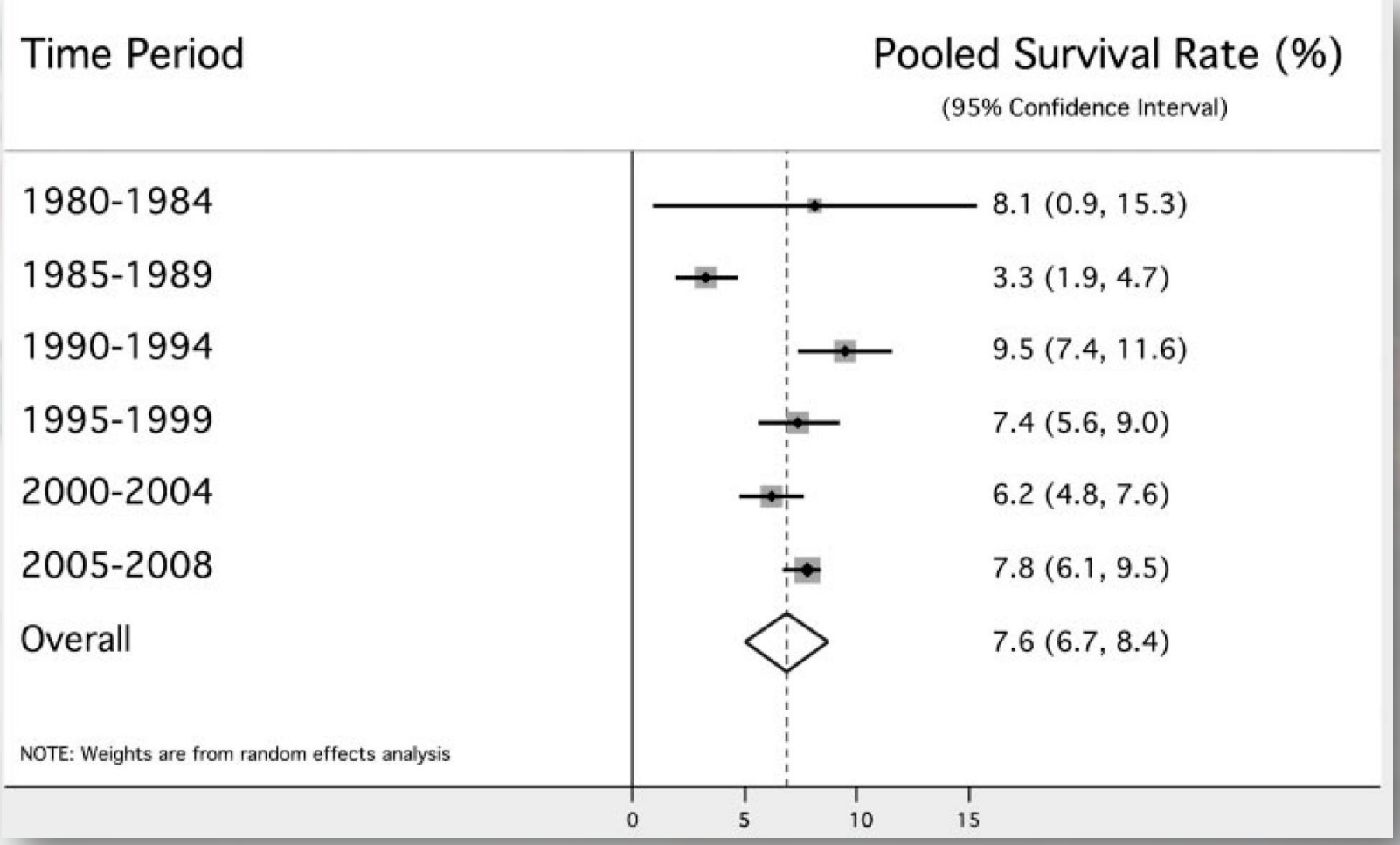
ABOUT CARDIAC ARREST

AND CPR

OHCA SURVIVAL TO HOSPITAL DISCHARGE

by 5-year time periods n = 141,581

Overall 7.6%



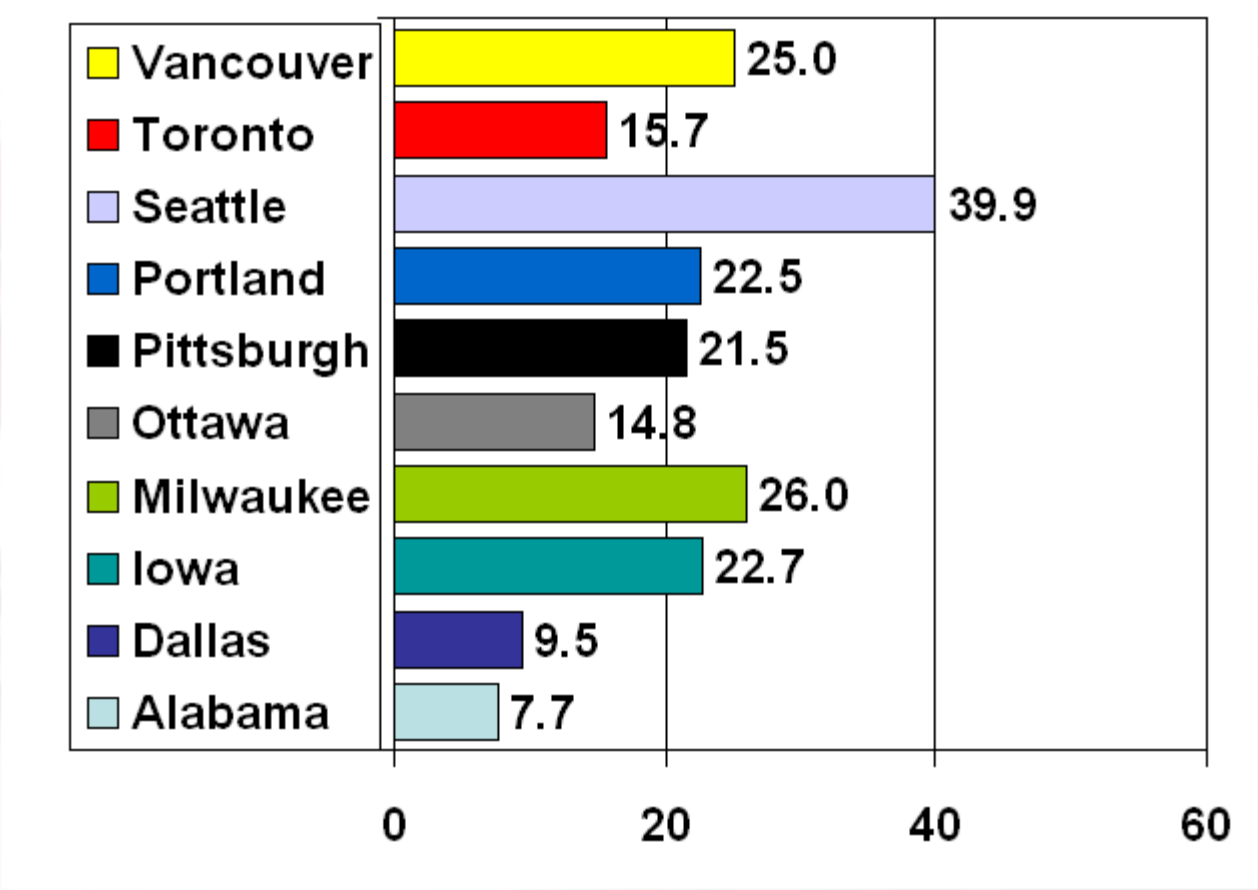
Circ Cardiovasc Qual Outcomes. 2010;3:63-81

Where We Really Impact Care

- 5 Time dependent conditions EMS can impact
  - 1. Respiratory distress
  - 2. STEMI
  - 3. Stroke
  - 4. Trauma
  - 5. Cardiac Arrest

Variation in survival VF arrest
Resuscitations Outcomes Consortium

Survival to discharge

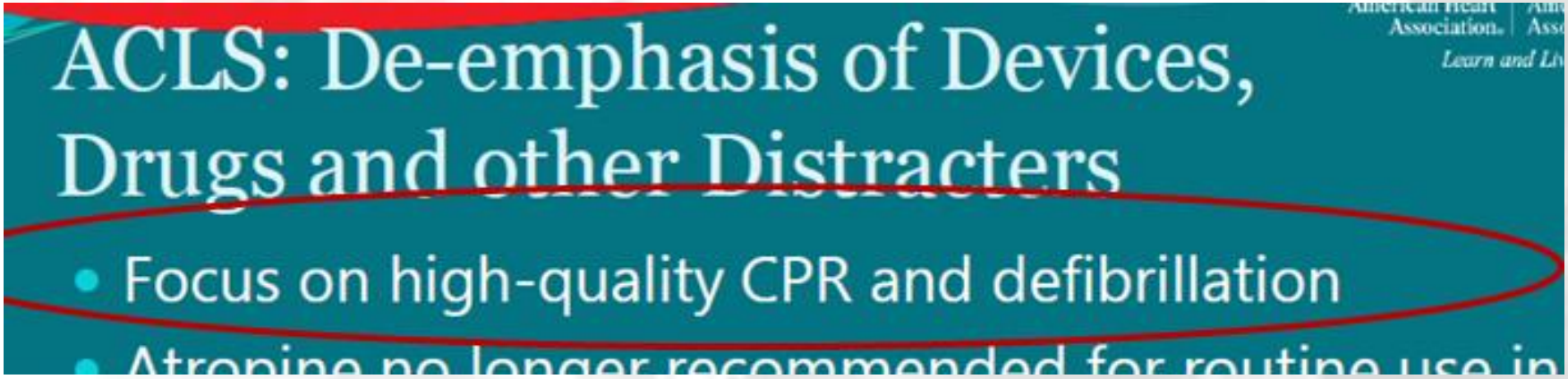


Nichol JAMA. 2008;300(12):1423-1431

Several changes to enhance survival of cardiac arrest.

AHA 2010 UPDATE

HIGH QUALITY CPR



High Quality CPR

- Goal: High quality means continuous chest compressions with *limited interruptions*
  - Rate: 100 – 120/min
  - Depth: 2 inches
  - Allow for complete chest recoil
  - Change every 2 minutes with pulse check
    - not to exceed 5 seconds
  - Address airway after unless indicated earlier

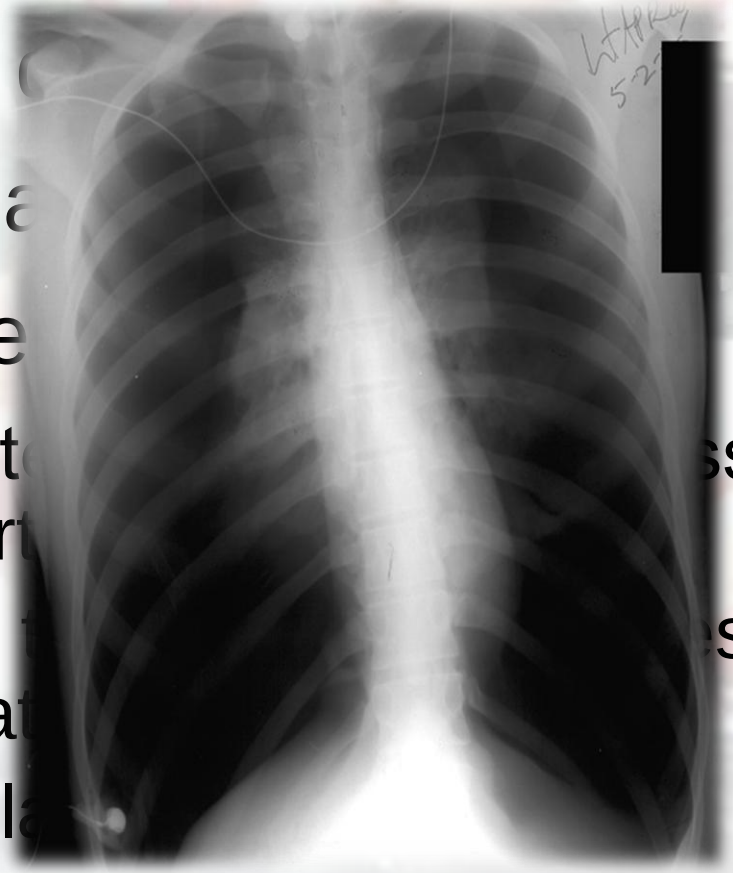
PREHOSPITAL HIGH QUALITY VENTILATIONS

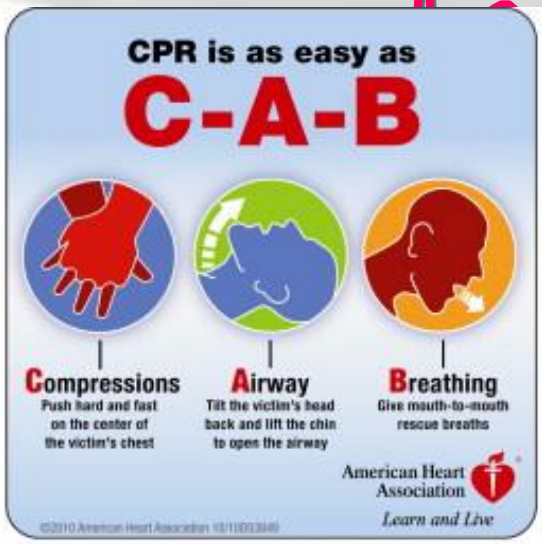
Goal: High

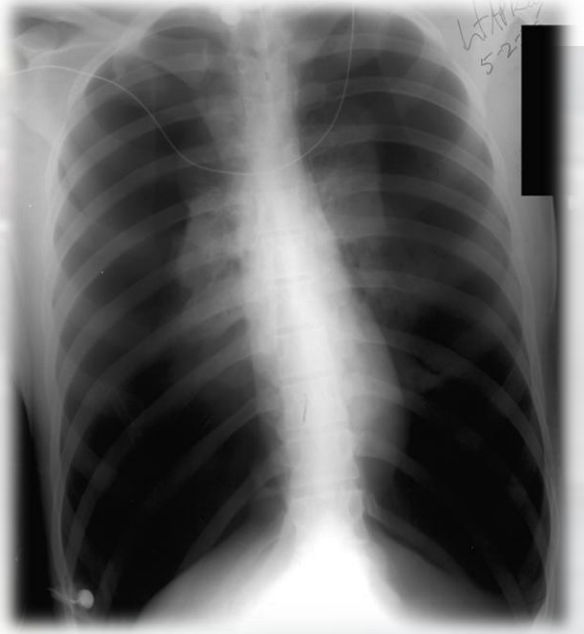
hyperventila

hyperoxyge

- Don't int ssion for insert
  - Adult s to de-sat
  - Ventil
  - Maintain SpO2 ≥ 94 %
  - Do NOT Hyperventilate

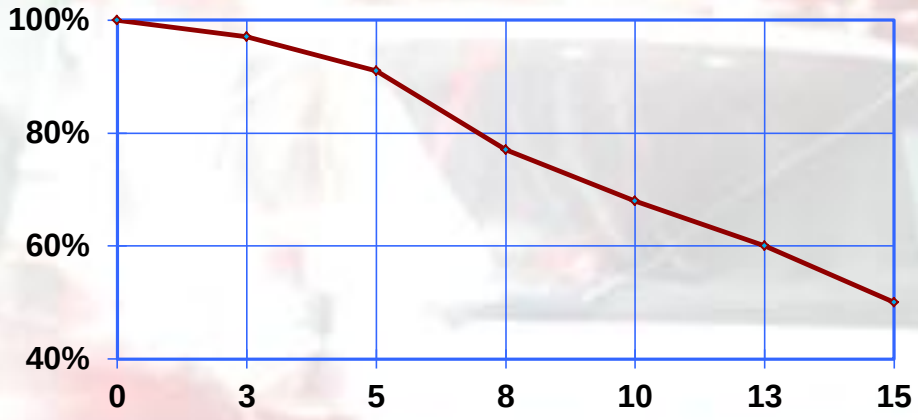






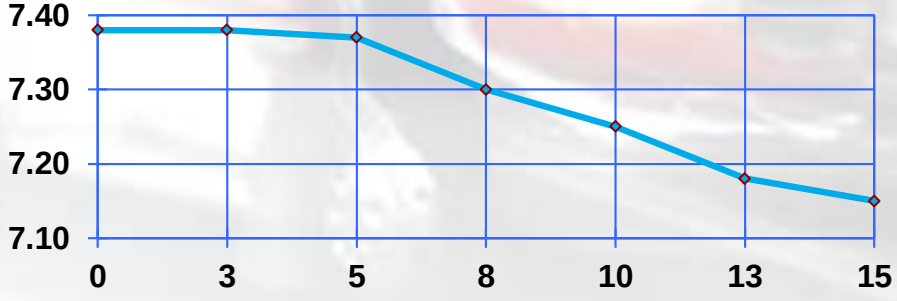
PREHOSPITAL HIGH QUALITY VENTILATIONS

Oxygen Saturation



min

Arterial pH



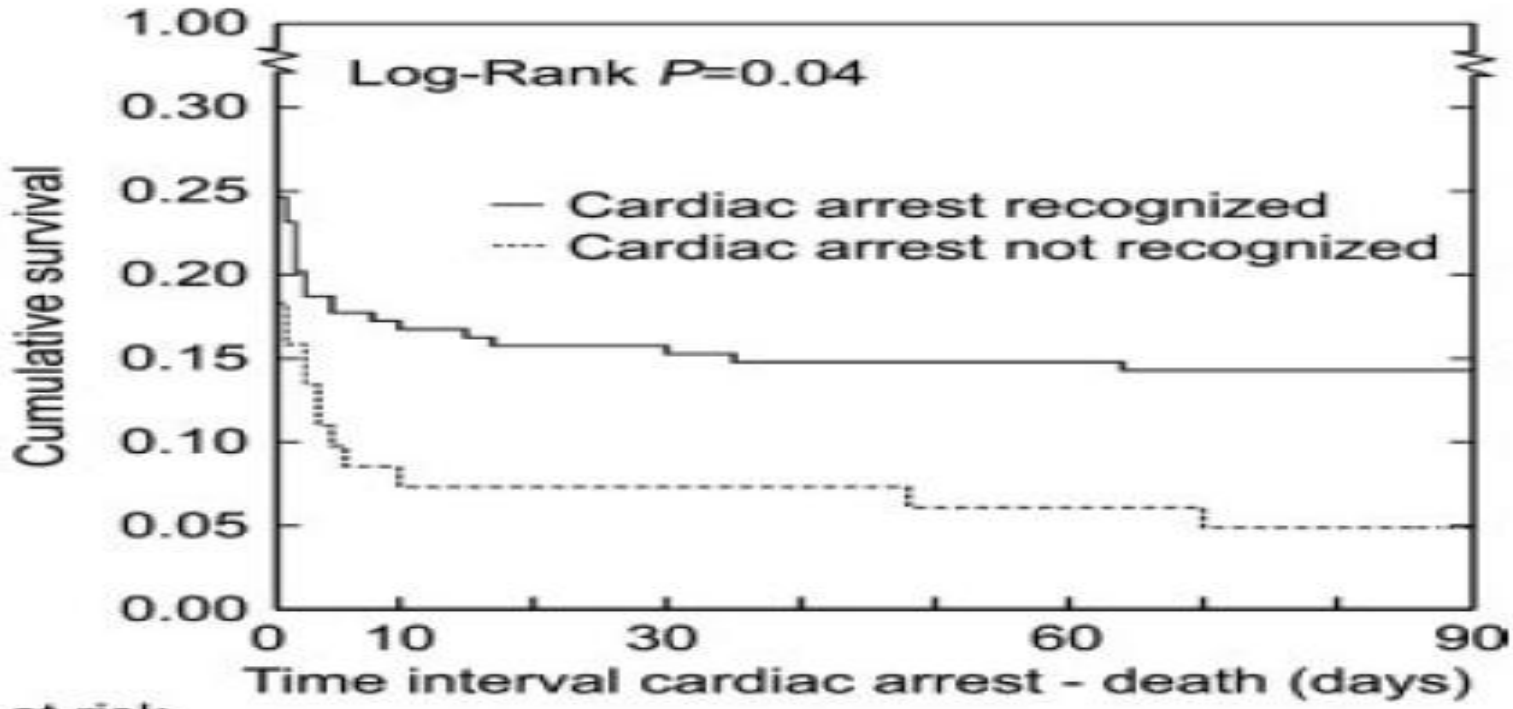
min

“The First, First Responder”

- What are the two interventions which result in best chance of survival?
  - 1. High-Quality CPR
  - 2. Early Defibrillation
- Why is EMD so important in cardiac arrest?

“The First, First Responder”

- Amsterdam dispatch
- nition
- ed
- 90



o. at risk

Time interval cardiac arrest - death (days)

o. at risk

Resuscitation Science

Importance of the First Link

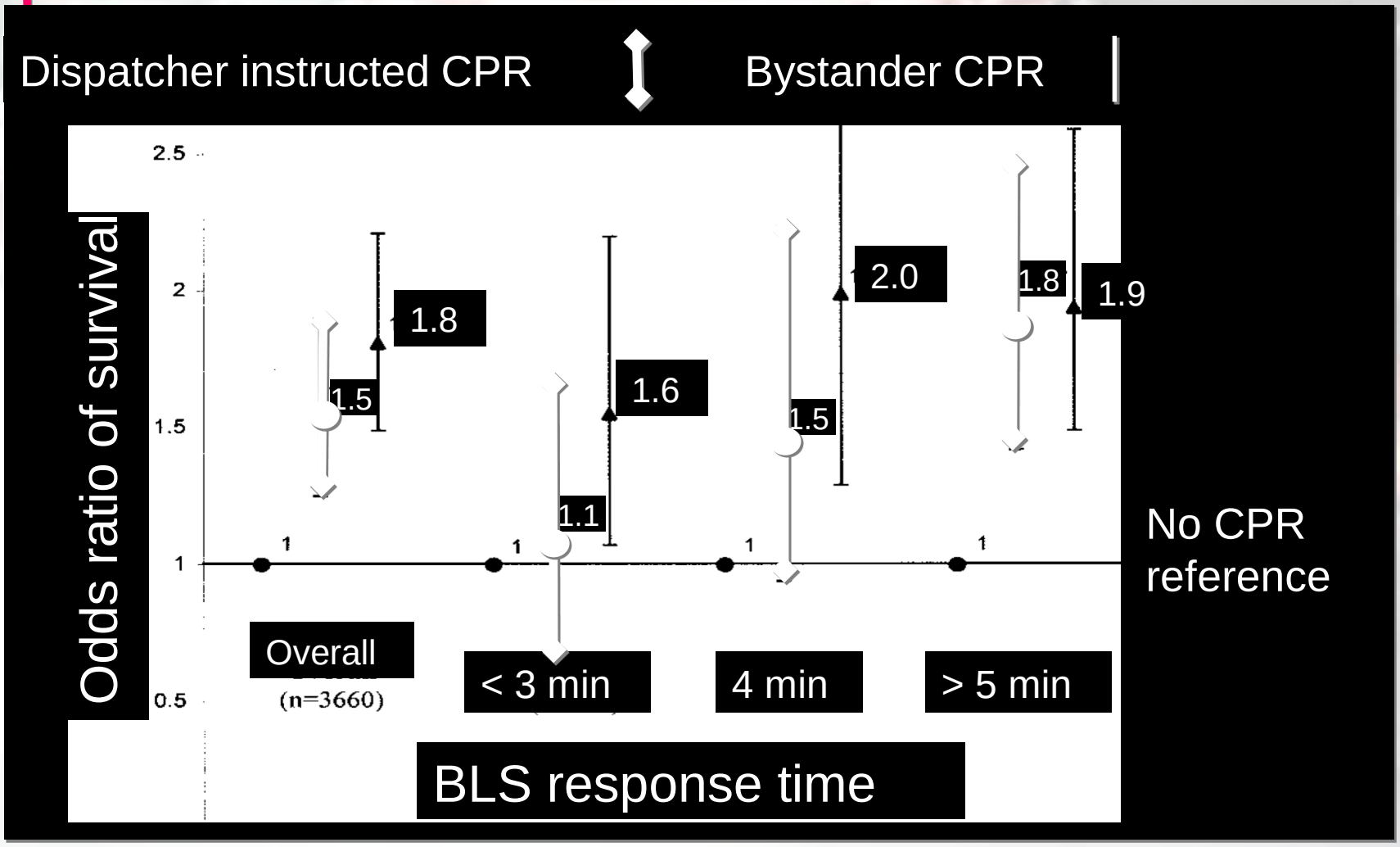
Description and Recognition of an Out-of-Hospital Cardiac Arrest in an Emergency Call

Jocelyn Berdowski, MS, MSE; Freerk Beekhuis, RN; Aeilko H. Zwinderman, PhD; Jan G.P. Tijssen, PhD; Rudolph W. Koster, MD, PhD

Berdowski, *J. Circulation*. 2009;119:2096-2102

Odds ratio of survival by CPR status and BLS response time

Witnessed cardiac arrest, King County 1983 – 2000, n = 7265



Rea TD *et al. Circulation. 2001;104:* 2513-2516.

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JAMA ORIGIONAL CONTRIBUTION

Chest Compression-Only CPR by Lay Rescuers and Survival From Out-of-Hospital Cardiac Arrest

Bobrow *et al.*

JAMA 2010;304:1447-1454

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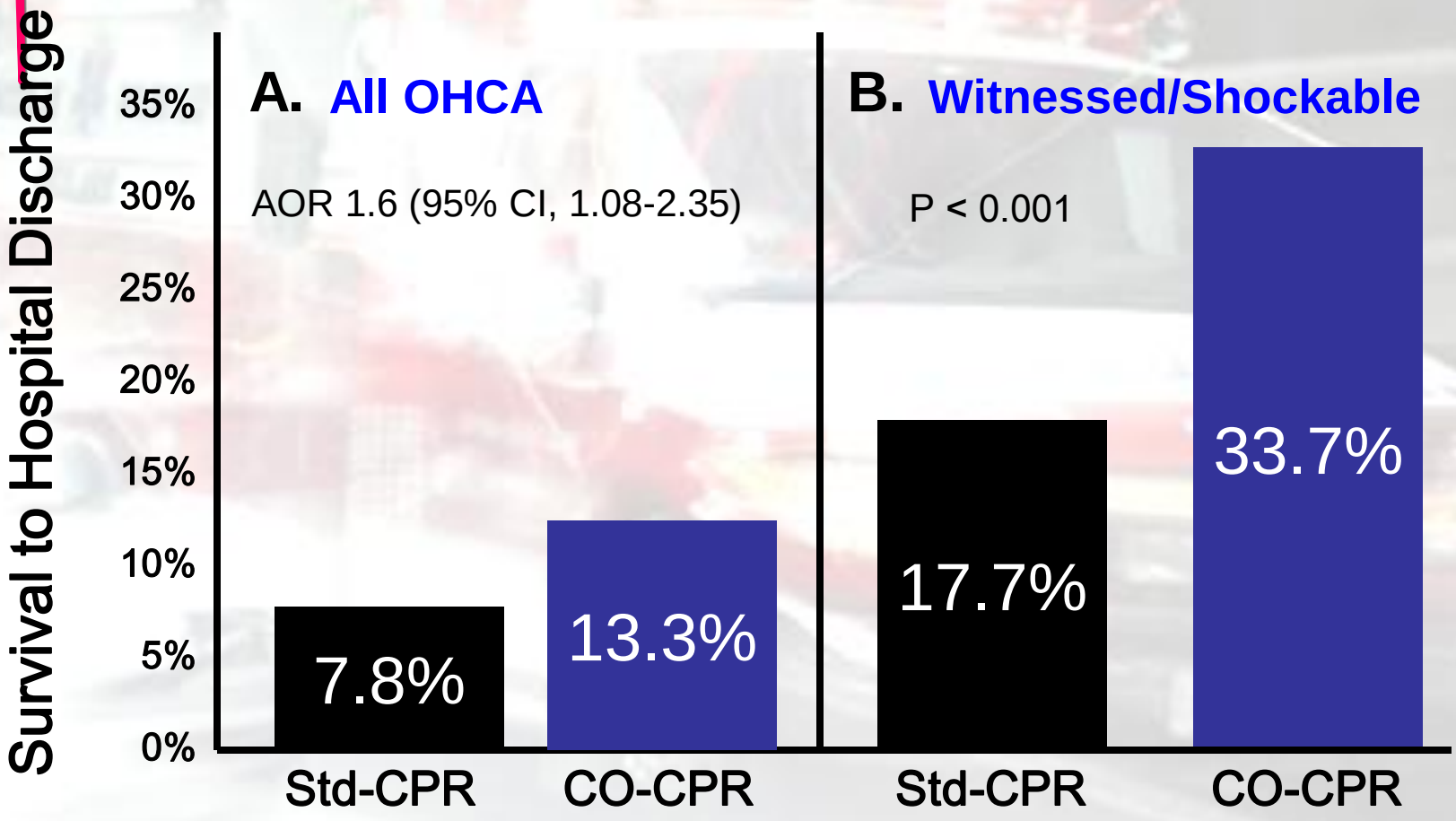


Bobrow, et al. JAMA 2010:304:1447-1454

Common Delays in Delivering CPR

- Research showed these common causes of delay to CPR:
  - Unnecessary questions asked
  - Bystander not near patient
  - Omission of “breathing normally”
  - Deviation from protocols

Unnecessary questions cause delays

- How old is the patient?
- Does the patient have a heart history?
- Duplication of questions.
- What is the patient experiencing?

EMD Case

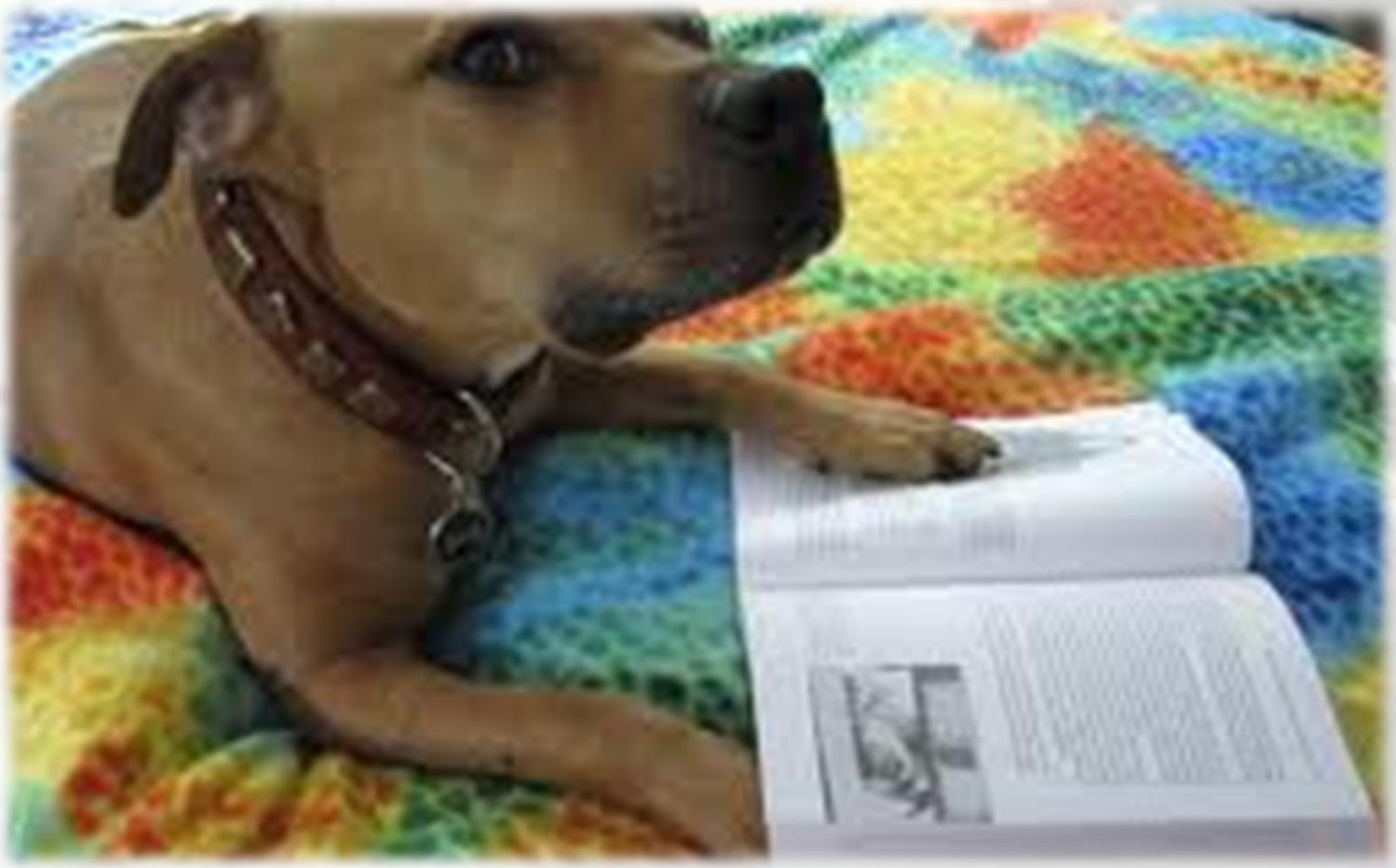
If patient is not conscious and not breathing - normally do we really need to [illegible] history?

All we n[illegible]

…th[illegible]d.

We need to offer CPR without delay and inform the caller that we will help them.

“The Agony of Agonal Respirations”



Agonal Breathing Facts

- Agonal breathing present 40 % of arrests
- Commonly mistaken for signs of life
- Very difficult to recognize over phone
- Prevents bystanders from CPR
- Caller may report as breathing to EMD

Agonal Breathing Facts

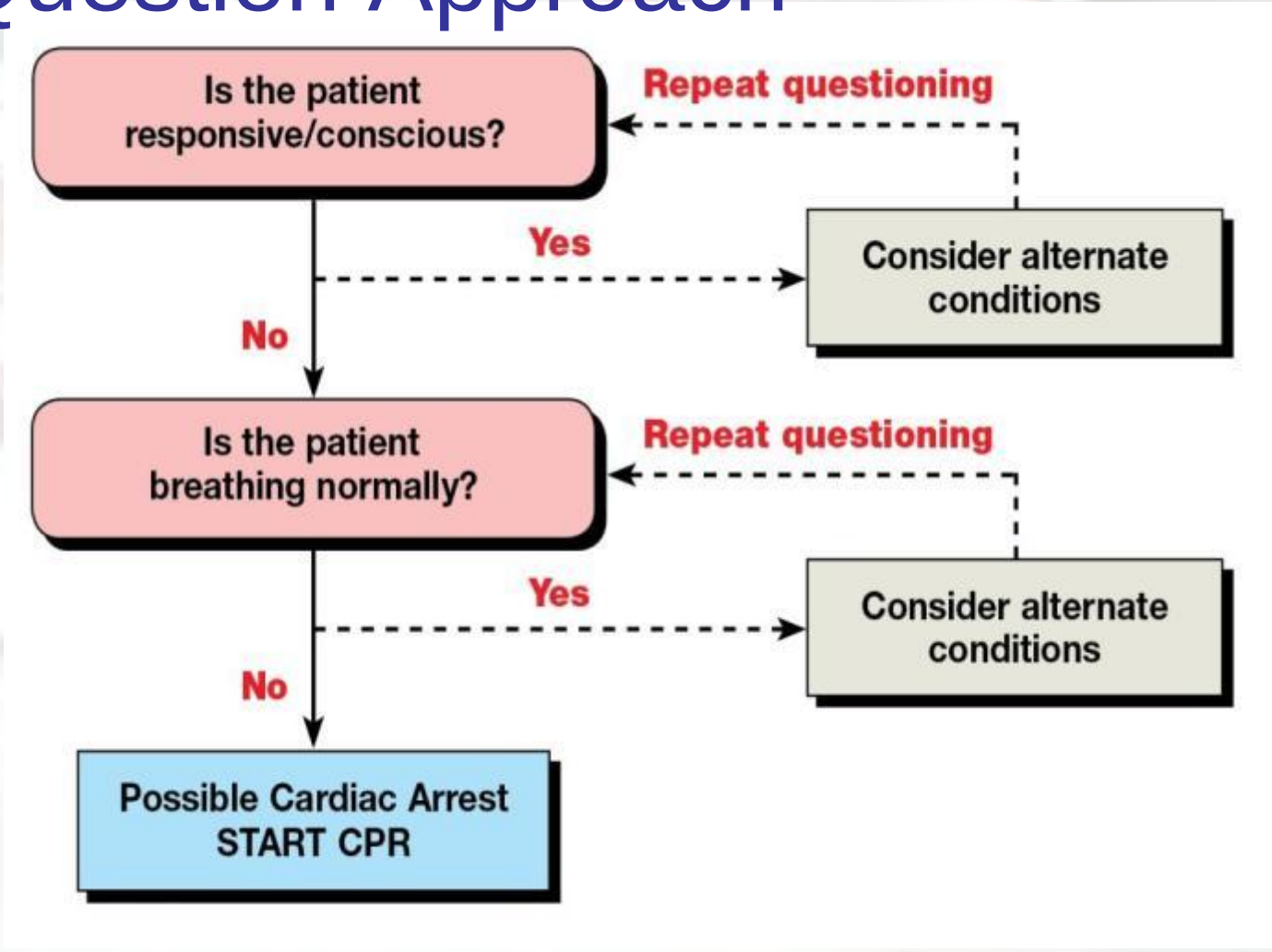
- Agonal breaths is the last respiratory pattern seen before apnea
- Duration may be 1 or 2 breaths
- Duration may be minutes to hours in some cases

Agonal Respirations

- Described by callers in a variety of ways:
  - barely breathing
  - heavy, labored breathing
  - gasping
  - snoring, snorting
  - gurgling
  - groaning, moaning
  - breathing every once in awhile

EMD Case

2-Question Approach

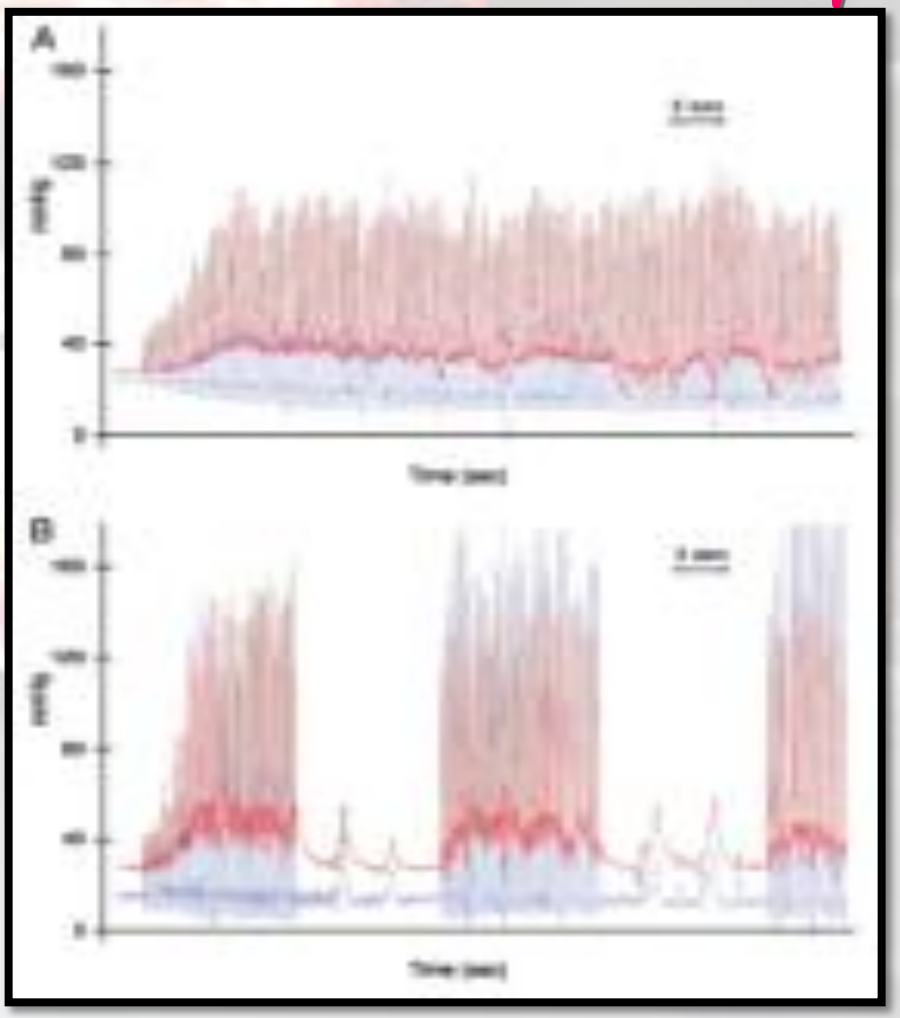


EMD CASE

BYSTANDER CPR

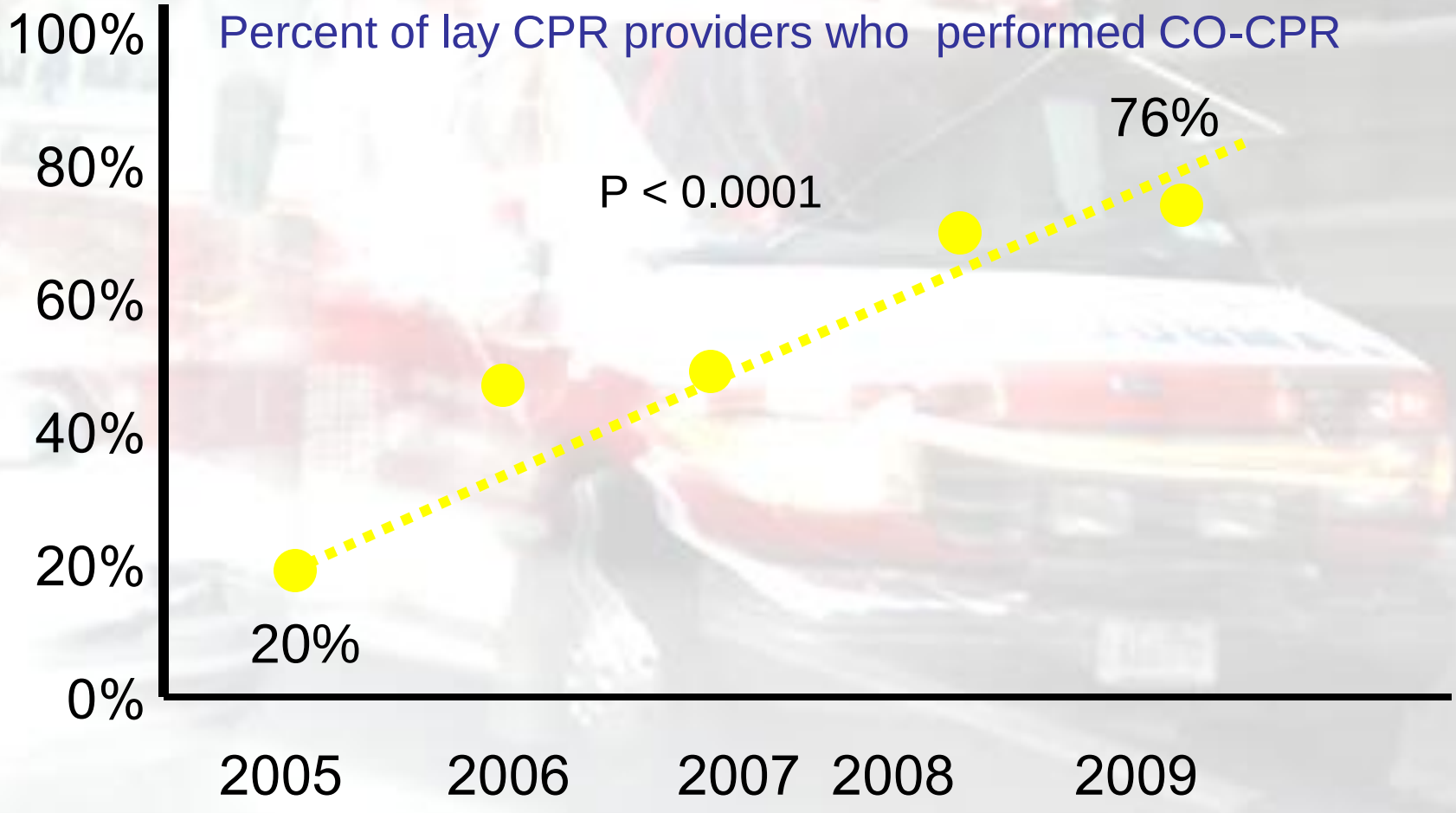
Chest Compression only CPR:

- Bystanders more willing to initiate
- Arterial blood is adequately oxygenated at onset of ***primary cardiac arrest***
- Less likely to cause regurgitation of stomach contents
- Rescue breathing interrupts critical chest compressions
- Easier to teach
- Observational evidence of improved survival



Ramaraj R, Ewy GA. Heart 2009;95:1978–1982.

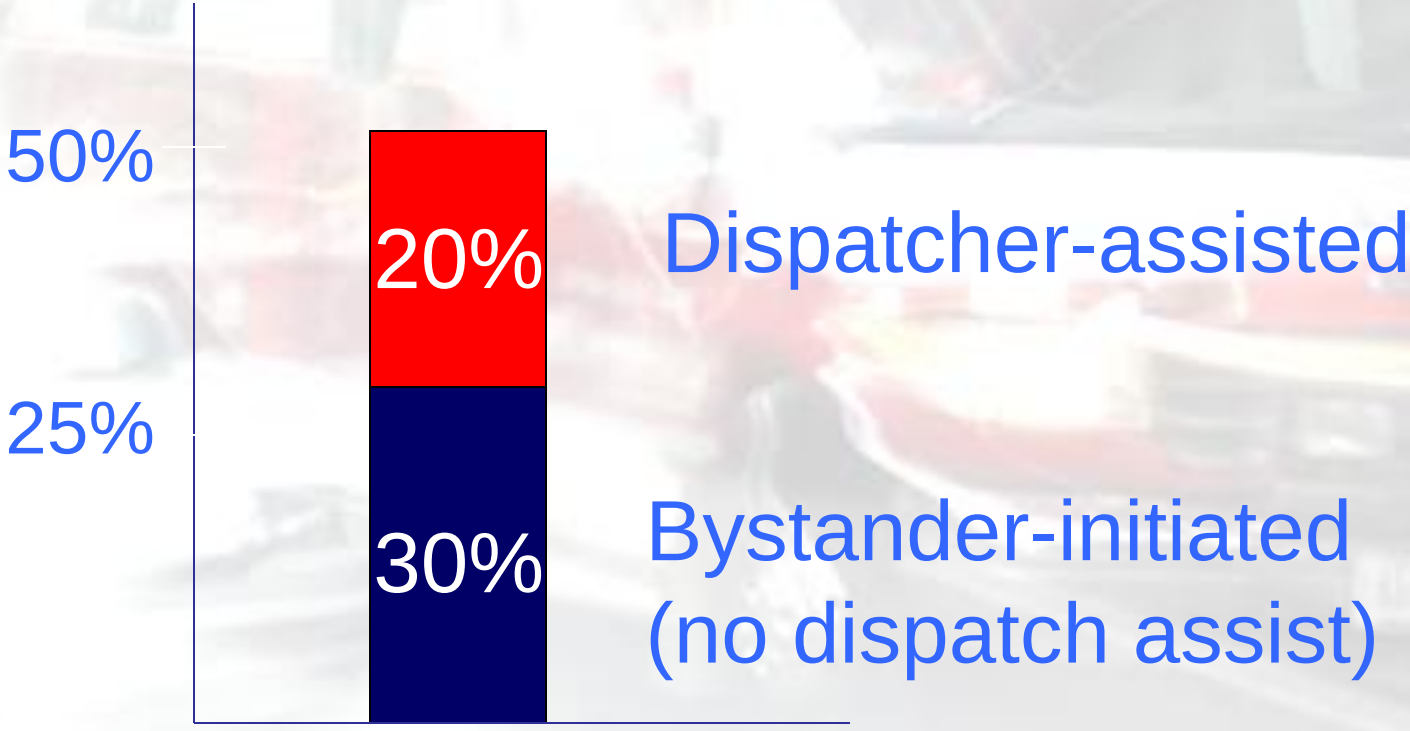
Bystander CPR OHCA in Arizona (2005 to 2010)



Bobrow, et al. JAMA October 6 2010

Dispatcher Assisted CPR King County

Bystander CPR since initiation of dispatcher assistance (1985 - 2007)



Potential to nearly double proportion who receive CPR

Barriers to Dispatcher Assisted CPR

Misconceptions and Accepted Knowledge

"We couldn't handle the increased workload."

"Dispatchers do not want another responsibility."

"Patients not in cardiac arrest could be **injured** by the dispatcher's instructions."

"It would increase our **liability** unacceptably."

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 for CPR & ECC

CLOSING: EFFECTIVE EMD CPR

- Quick and efficient call handling
- Immediate recognition of cardiac arrest
- Rapid dispatch of Basic Life Support (BLS) units
- Quickly determining the presence of Public Access Automatic External Defibrillators (AED)
- Rapid dispatch of Advanced Life Support (ALS) units
- **Assisting in the quick and efficient delivery of CPR by the caller or bystander**

2-Question Approach