



# **Applying AHA Time Standards in the Emergency Medical Dispatch Center**

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# Who Are We?

- The International Academies of Emergency Dispatch
  - Non-profit
  - Protocols in 46 countries
    - 21 language translations
  - 63,372 currently certified dispatchers
    - 5,940 currently certified EMD Quality Assurance (EMD-Q) Specialists
  - Approx. 80 million medical calls annually
    - Approx. 1.5% (n=1.2 million) Cardiac Arrest calls
  - Providing scripted tCPR instructions since 1979 (38 years)

# Cardiac Arrest at Dispatch: When Everything Goes Right

- Man-down in Walmart (condensed audio)



Listen carefully.

(Not pregnant or Not 3rd TRIMESTER) Lay them flat on their back on the floor/ground and remove any pillows.

Listen carefully and I'll tell you how to do chest compressions.

(Not pregnant or Not 3rd TRIMESTER) (Make sure they are flat on their back on the floor/ground.)

Place the heel of your hand on the breastbone (in the center of the chest), right between the nipples.

Pump the chest hard and fast, at least twice per second and 2 inches (5 cm) deep.

(Single rescuer) Let the chest come all the way up between pumps. We're going to do this until help can take over. Count out loud so I can count with you.

\* Have the caller count the compressions out loud. Use the Compressions Monitor Tool to encourage and coach the caller on compression speed.

Cardiac Arrest identified  
**36 seconds** after  
address/phone verification

Instructions started **42  
seconds** later  
(after responder agency  
notified)

Compressions started **48  
seconds** after instructions  
started

# Cardiac Arrest at Dispatch: When Everything Goes Right

## Case summary

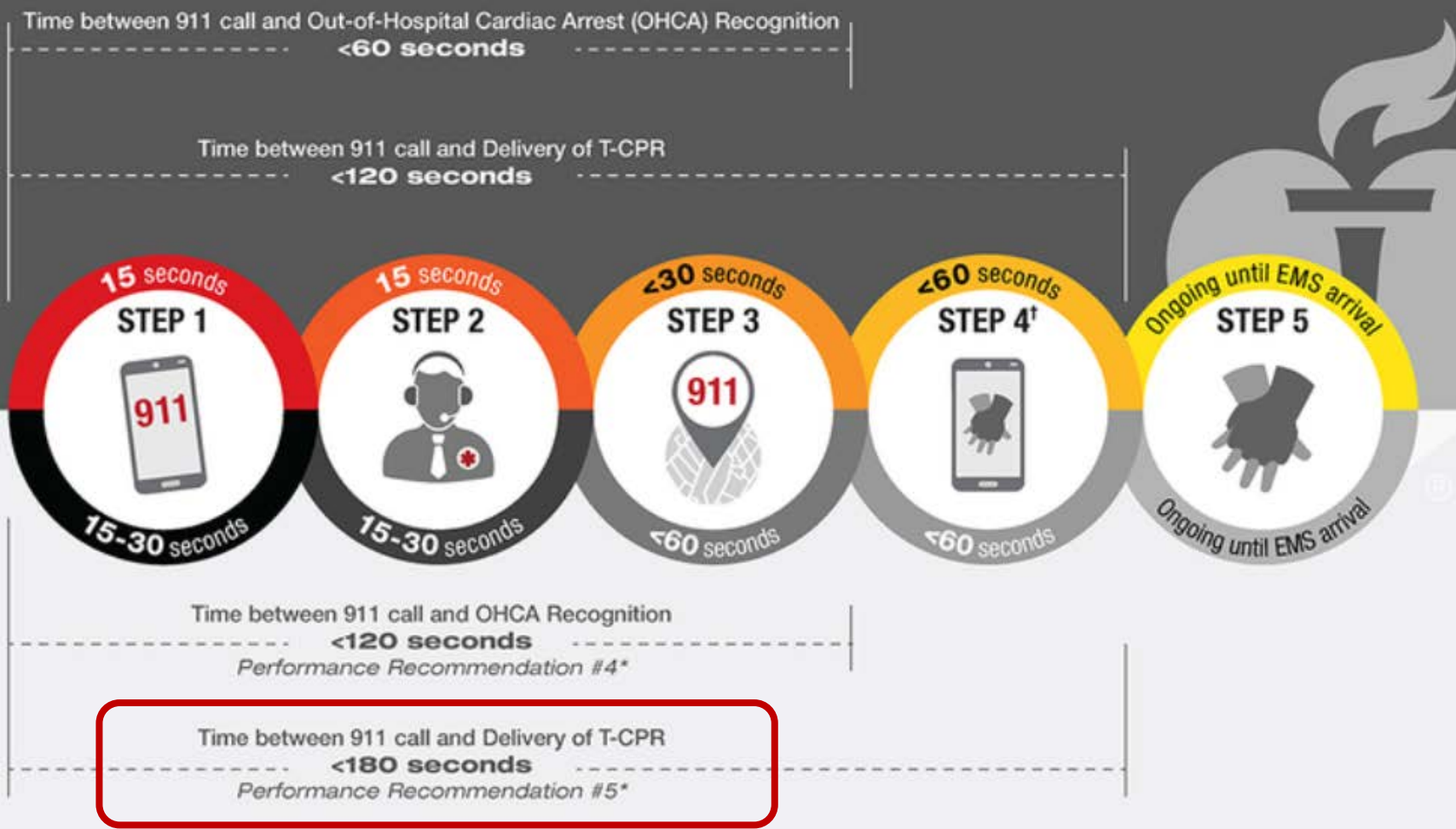
- Patient **survived**
  - Walked out of hospital neurologically intact
- **Bystander/PD compression** done for **9 mins 40 secs** at 100 cpm
- **First AED shock** delivered at **7 mins 45 secs** from start of call
- **3 shocks** delivered by time of paramedic arrival
- Total **paramedic response time** to patient side: **12 mins 50 secs**

# AHA Recommendations for tCPR

## Telephone CPR (T-CPR) Time Interval Standards

HIGH-  
PERFORMANCE  
SYSTEM

MINIMAL  
ACCEPTABLE  
STANDARD



### STEP 1

911 call connects to Primary Public Safety Answering Point (PSAP)

### STEP 2

Primary PSAP connects to Emergency Medical Dispatch (EMD) PSAP

### STEP 3

Address acquisition

### STEP 4<sup>†</sup>

Recognition of OHCA  
1. Call taker verbally recognizes OHCA  
2. Instructions started for T-CPR

### STEP 5

Delivery of first T-CPR compression and continued T-CPR support

# AHA Recommendations for tCPR

## OHCA Recognition

- **Definition:** Telecommunicator recognized / total OHCA (EMS-confirmed)
  - Performance Goal: **75%** (**95%** after exclusions)

# OHCA Recognition

## Challenges

- 1) False positives
  - EMD-misidentifies cardiac arrest (EMD fails to do airway management)
- 2) Agonal/Ineffective breathing
  - Failure to identify arrest (false negatives)
- 3) Caller-related barriers
  - Language, caller not with patient, emotional/hysterical caller etc



# OHCA Recognition



## FALSE POSITIVE (FP) RATE

**OVER-CALL:** Telecommunicator suspects/ identifies cardiac arrest and T-CPR instruction given; EMS impression of patient found to have other than “cardiac arrest” (i.e. seizure, drug overdose, etc.)

## FALSE NEGATIVE (FN) RATE

### UNDER-CALL:

1. Unidentified but identifiable (*opportunity*)
2. Unidentifiable for reasonable exclusion:
  - 3rd party
  - Language Barrier
  - Hysteria, etc.

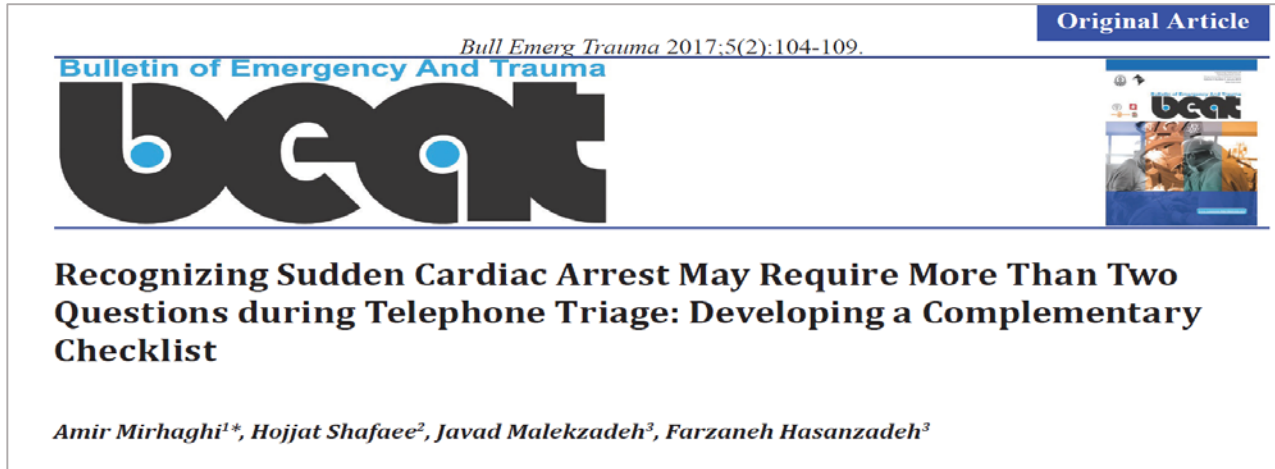


# OHCA Recognition

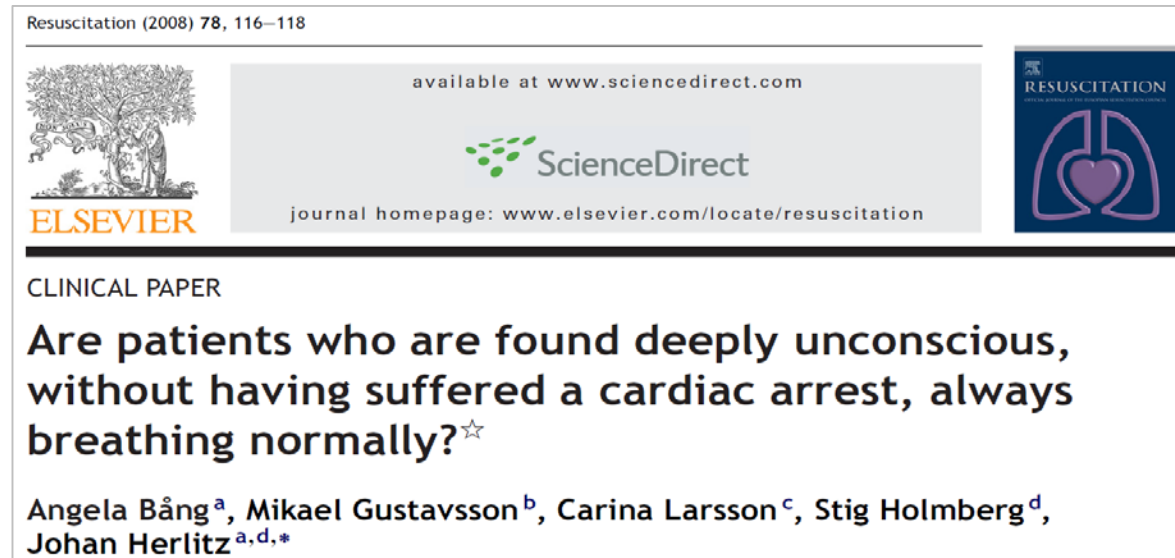
## Solutions

- 1) Breathing detector (timed breathing rate)
- 2) Keywords/phrases in caller problem description—that describe agonal/ Ineffective breathing
- 3) Use of language lines, bilingual EMDs
- 4) Effective caller management techniques

# Abnormal Breathing Is Not Always Predictive of Cardiac Arrest



Decision support tools can potentially increase recognition rate of SCA cases, and therefore produce a higher rate of dispatcher-directed CPR.



53% (24/45 cases) had signs of abnormal breathing—as reported by ambulance crew

# OHCA Recognition

Using breathing detector: Arrest or Non-Arrest?



**Non-arrest/airway  
management required**  
Post-seizure patient



**Non-arrest/airway  
management required**  
Massive hemorrhagic stroke

Effective breathing rate

# OHCA Recognition

## Keywords/Phrases

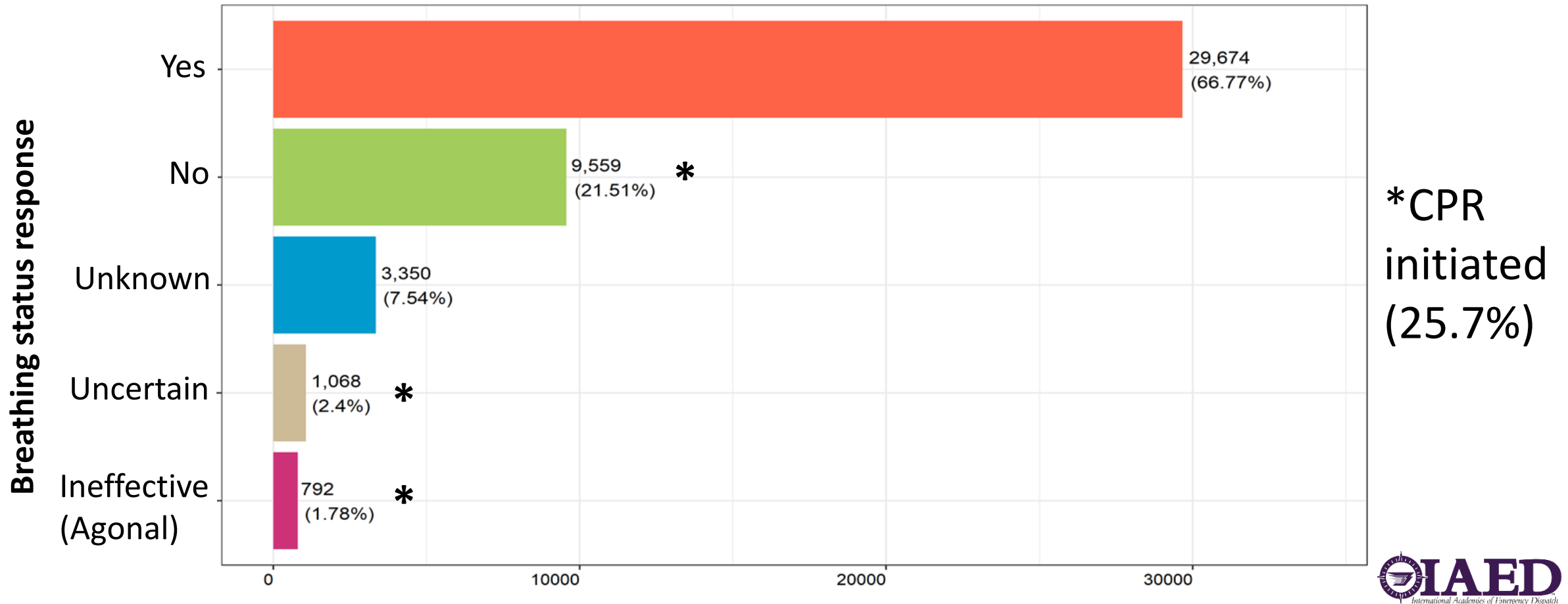
### INEFFECTIVE BREATHING

The following, or reasonable equivalents, when **volunteered** at any point during Case Entry

- "Barely breathing"
- "Can't breathe at all"
- "Fighting for air"
- "Gasping for air" (AGONAL BREATHING)
- "Just a little" (AGONAL BREATHING)
- "Making funny noises" (AGONAL BREATHING)
- "Not breathing"
- "Turning blue" or "Turning purple"

# OHCA Recognition

- (Effective) breathing status of initially unconscious patients  
(N = 44,443 / 697,210 cases)



# AHA Recommendations for tCPR

## tCPR Directed Compression

- **Definition:**

Median amount of time in seconds between 911 call connected and first CPR compression directed by telecommunicator

- **Benchmark:**

< 180 seconds from call pickup (or <120 seconds) to first CPR compression directed by telecommunicator



# First tCPR Directed Compression

- Changing patient condition

Measure*	Median time (in seconds)		
	Initial arrest (N = 3,811)	Arrested during call (N = 414; 9.8%)	Overall (N = 4,225)
Cardiac arrest recognition	40	57	41
CPR instructions started	68	146	72
Hands on chest	115	197	120
Bystander compressions started	144	255	149

\*After address/phone verification—and includes non-traumatic arrests

# AHA Exclusion Criteria

- CPR is already **in progress** by bystander
- **Caller** is **unable** to physically **perform CPR** (i.e., caller at alternative location to OHCA)
- Caller is **unable** to get **patient** into appropriate **position** for CPR (i.e., can't move patient from bed to floor)
- Caller **refuses**
- For **safety**, T-CPR instructions not given (e.g., traumatic, disaster scenario, etc.)
- **Hang ups**
- Other circumstances **supervisor deems** T-CPR could not be performed

# First T-CPR directed compression

## Challenges

- Overcoming barriers (CPR save – Patient on belly)

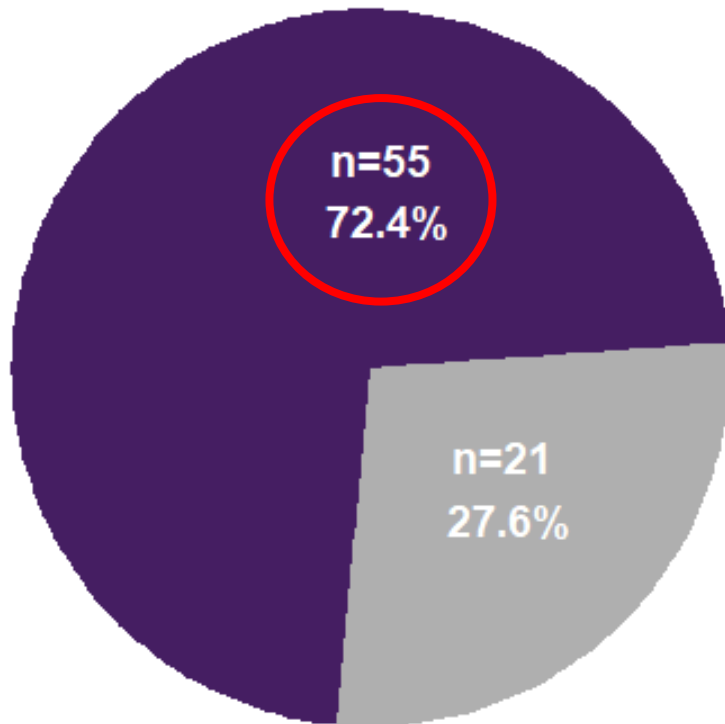


# **The Bigger Picture: Our Recommendations**

# Most Calls are Barrier Calls

- **Recommendation 1:** Report all barrier calls while reporting HOC time

*Example:* Audio review (n=76)

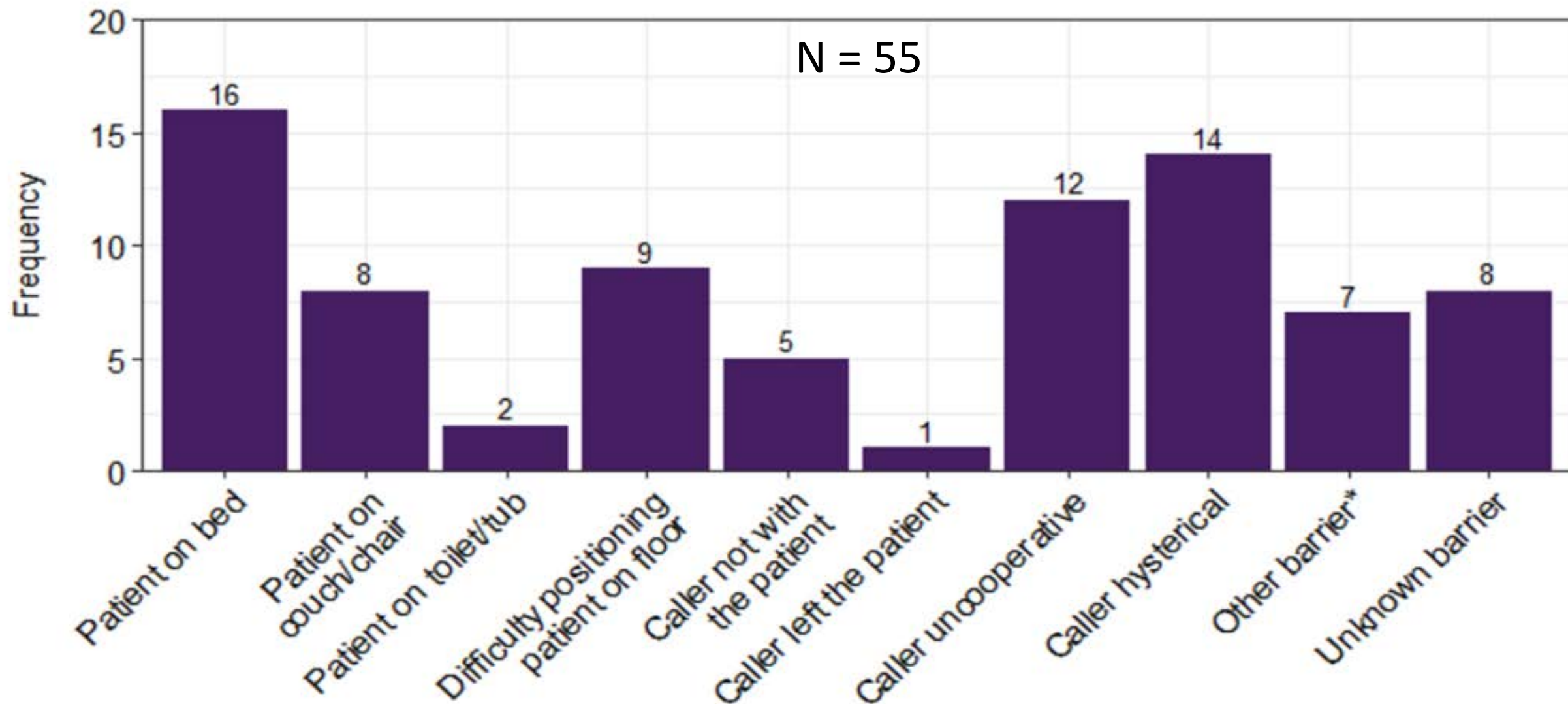


Median HOC time (Q1, Q3) – in seconds			p
Overall	No Barrier	Barrier	
136 (87, 186)	94 (60, 146)	147 (102, 195)	0.0102

Group  
■ Barrier  
■ No Barrier

HOC = Hands on chest time  
Q1/Q3 = 25<sup>th</sup>/75<sup>th</sup> percentiles

# Barrier Types





# Metronome

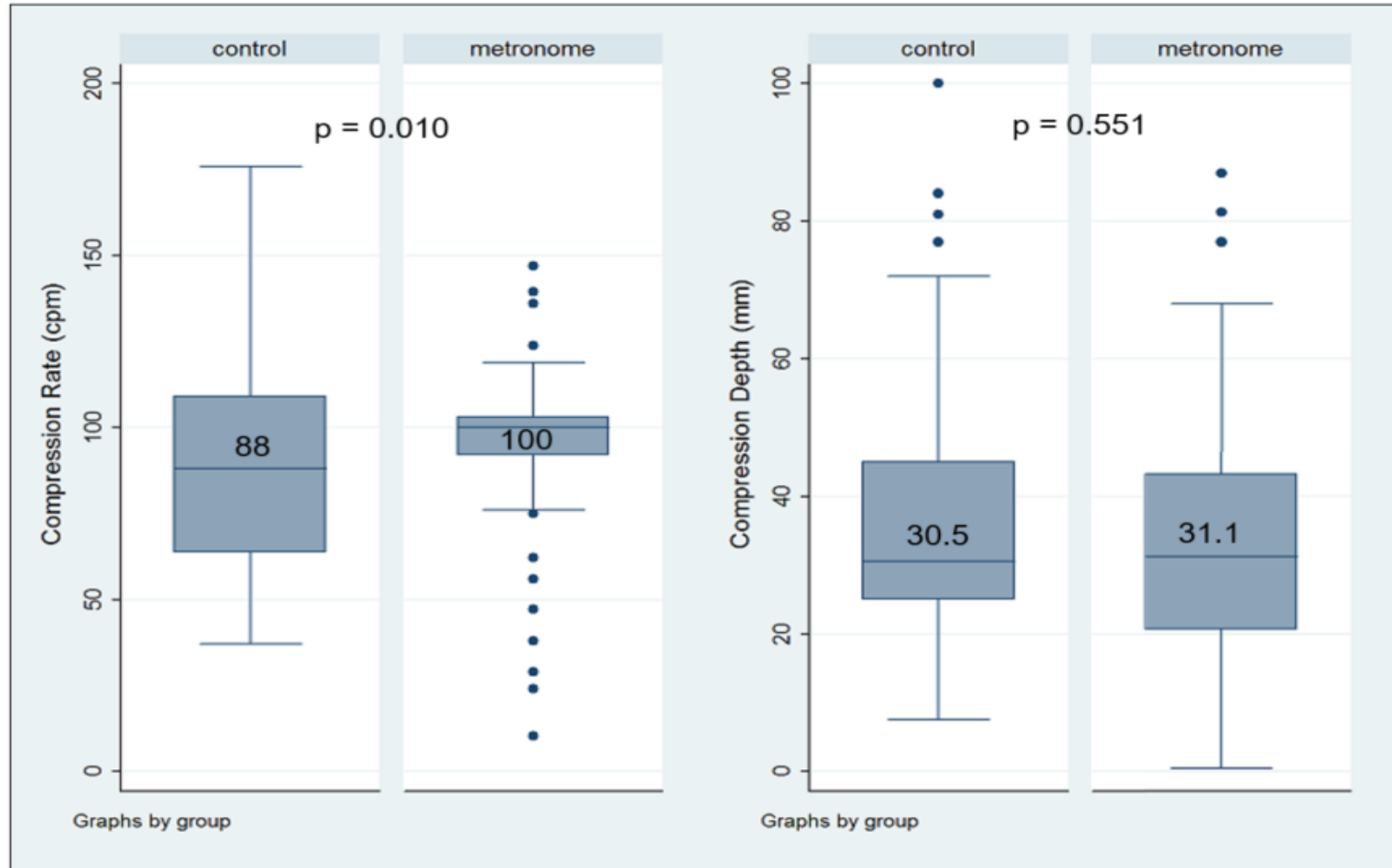
- **Recommendation 2:** Use metronome for all tCPR directed compressions

Getting hands on chest fast is important—but so is achieving high-quality bystander CPR whenever possible



# Metronome

- Use metronome for all tCPR directed compressions (N = 155)



Controls : n = 67

Metronome: n = 88

**AHA Recommended:**

Compression

100-120 cpm

Depth

2-2.4 inches

(50-60 mm)

Figure 1. Compression rate and depth classified by study group

# Most Arrests are NOT V-fib/VT

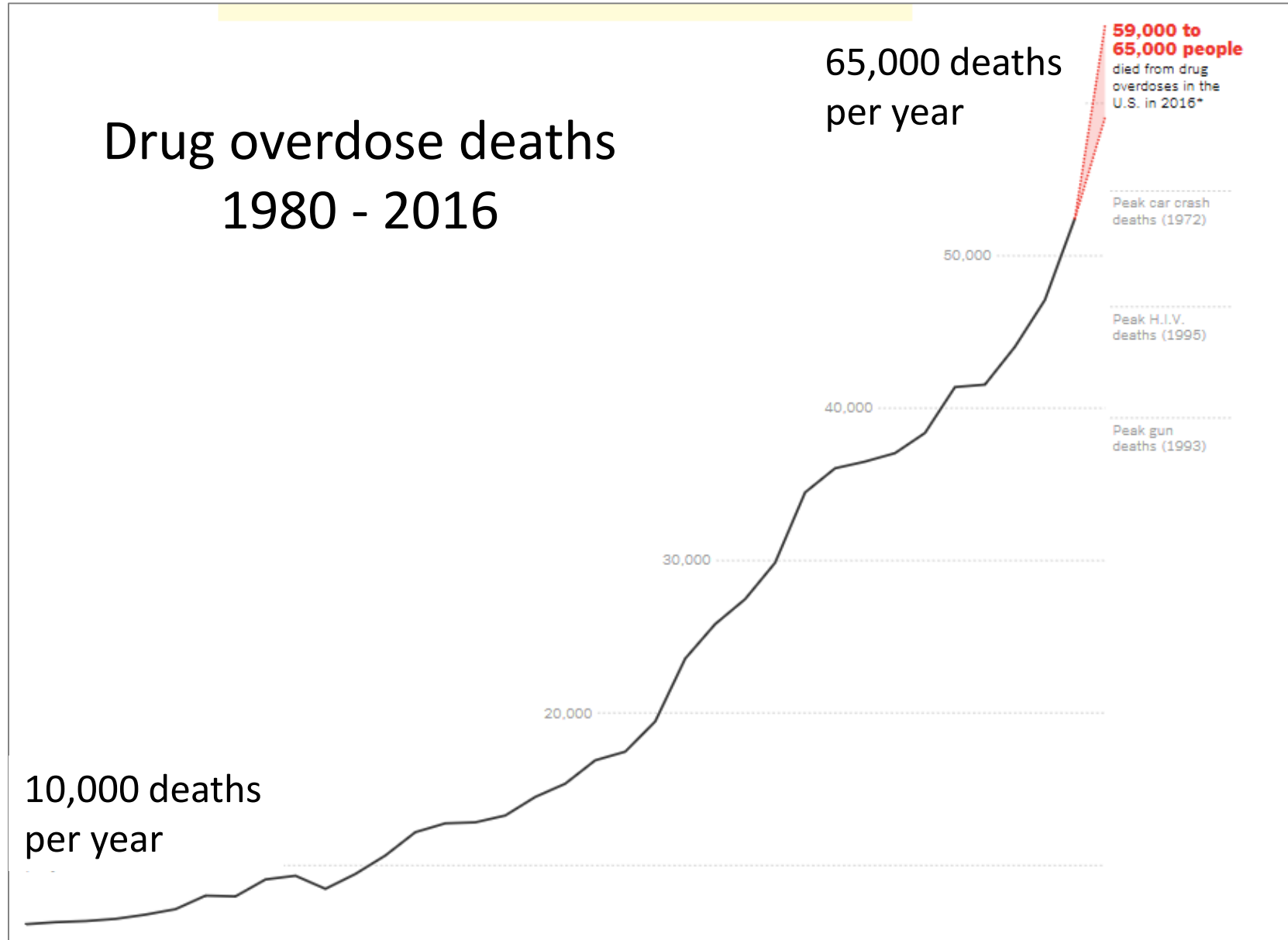
- **Recommendation 3:** Identify and treat respiratory/asphyxial arrests

Initial EMS Rhythm	(N = 33,553) n (%)
VF/VT	7,086 ( <b>20.7</b> )
PEA	8,196 (24.0)
Asystole	16,163 (47.3)
No shock/No strip	942 (2.8)
Cannot determine	1,166 (3.4)

Source: Resuscitation Outcomes Consortium (ROC) [2006-2013] – Daya MR et al., June 30, 2015

<http://nationalacademies.org/hmd/~media/Files/Report%20Files/2015/ROC.pdf>

# Overdose = Respiratory Arrest



Source: CDC

# Handling Respiratory/Asphyxial-Caused Arrest

By DEAN REYNOLDS / CBS NEWS / June 6, 2017, 8:00 PM

## Overdoses now leading cause of death of Americans under 50

CLEVELAND, Ohio -- Overdoses are now the leading cause of death of Americans under the age of 50.



2 heroin OD patients  
down (both survived)

# Safety First



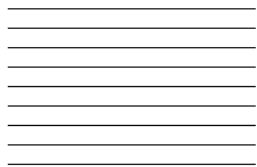
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0736-4679/\$ - see front matter

<http://dx.doi.org/10.1016/j.jemermed.2013.05.003>



## ***Selected Topics: Prehospital Care***

### **UNRECOGNIZED CARBON MONOXIDE POISONING LEADS TO A MULTIPLE-CASUALTY INCIDENT**

Dominik Roth, MD,\* Mario Krammel, MD,† Wolfgang Schreiber, MD,\* Harald Herkner, MD, MSC,\*  
Christof Havel, MD,\* and Anton N. Laggner, MD\*



# Safety First

- Some of the conditions in which OHCA may also involve serious safety concerns for bystanders, rescuers, and/or responders
  - Electrocution
  - Traffic accidents
  - Assailant involved
  - Carbon monoxide
- In these instances, safety issues must be identified *before* sending a rescuer to help the patient

# One more life saved...

- 17-year old collapses on high school track



# AHA Recommendations—And Beyond

- We applaud the AHA for creating these recommendations; we have been doing, and advocating for, dispatcher-assisted CPR for 38 years
- Although this is a good start, we need to be measuring *all* CPR and OHCA cases to see real system improvement, not just focusing on the “ideal” situations (e.g., witnessed v-fib)
- Doing so not only provides better information, but gives us the ability to actually *do* something about it, such as:
  - Instructions to overcome barriers, check breathing, etc.
  - Assessment and improvement of bystander CPR quality
  - Training on *all* types of CPR calls and issues for EMDs

# Thank you!

## Q & A