

EMS Topics



BEST EMS

Justin R. Norheim D.O., FP-C
Emergency Medicine
BEST EMS Assistant Director
Assistant Professor Department of Emergency Medicine
TCU Burnett School of Medicine
NCTTRAC Medical Director Committee Chairman
NCTTRAC EMS Committee Co-Chairman
Integrative Emergency Services
Baylor Scott & White Health System

About BEST EMS

BEST EMS serves as Medical Control for over 40 Fire/EMS/FRO agencies

BEST EMS is comprised of 8 ER physicians and 6 paramedics

> 100,000 EMS calls per year

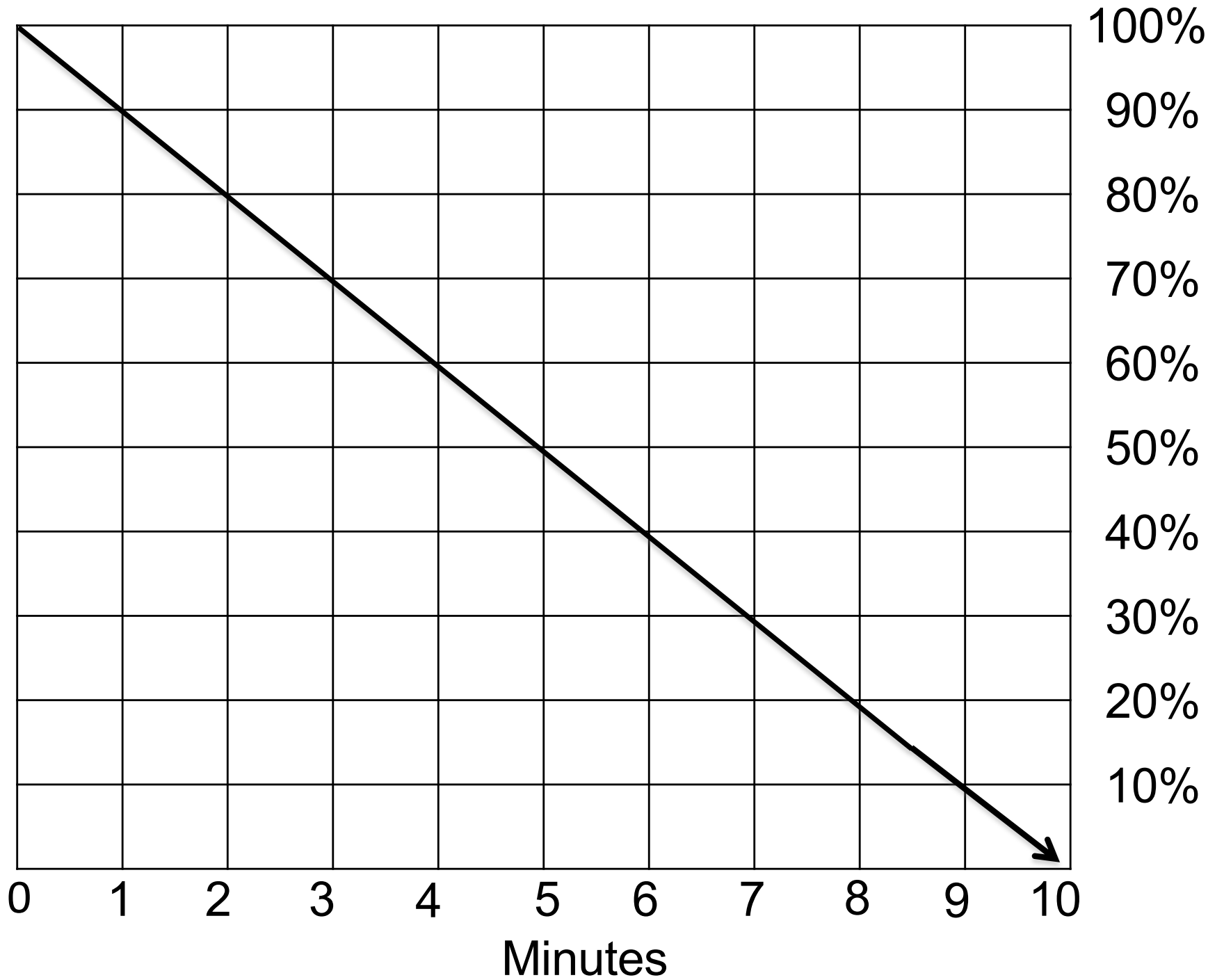
> 800 cardiac arrests per year



Addison Fire
Aubrey Fire
Carrollton Fire
Central EMS
Colleyville Fire
DFW Airport Fire
Denton County ESD #1
Eagle Mountain Fire
Euless Fire
Everman Fire
Farmers Branch Fire
Fidelity Investment EMS
Forney Fire
Gaylord Texan EMS
Grapevine Fire
Hurst Fire
Keller Fire

Kennedale Fire
Lake Jackson EMS
McKinney Fire
All Parker County ESD's Fire
Parker County Hospital District EMS
Pilot Point Fire
Portland Fire
Roanoke Fire
Sabre
Sachse Fire
Southlake Fire
Travis County ESD #1 Fire
Trophy Club Fire
Van Alstyne Fire
Weatherford Fire
Westlake Fire





Disparity in CPR Delivery

125 EMS agencies with ≥ 150 CARES cases in 2017.

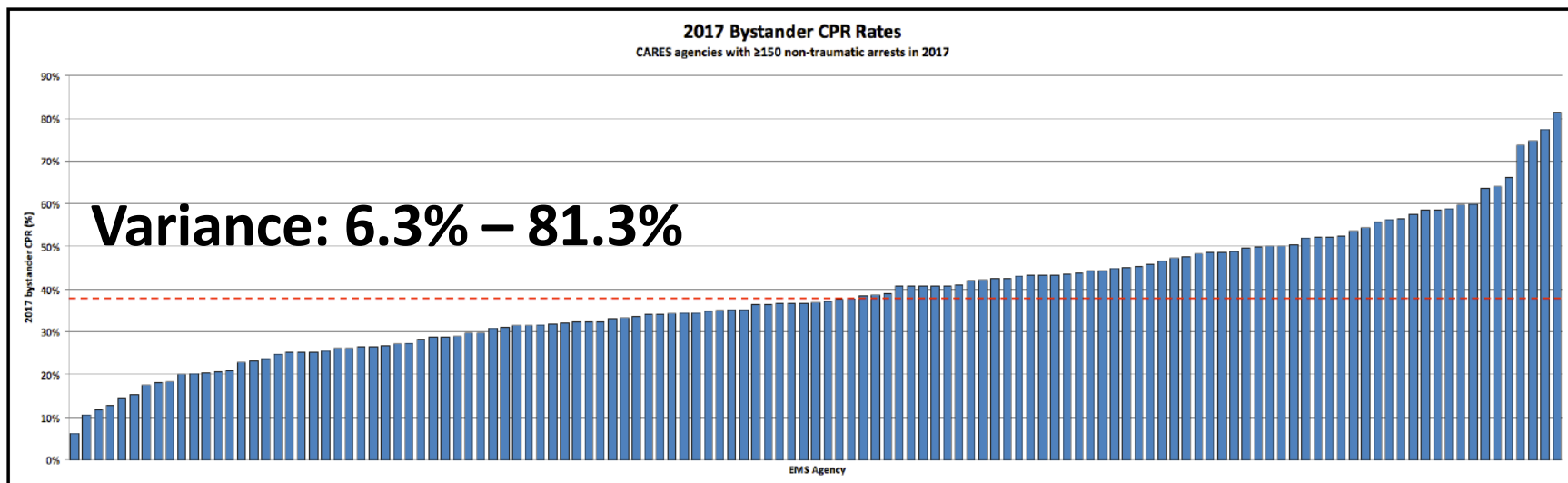


Figure 24. Variability in bystander CPR rates, among EMS agencies with ≥ 150 CARES cases in 2017.

Disparity

All rhythm survival (communities with
over 100 arrests annually)

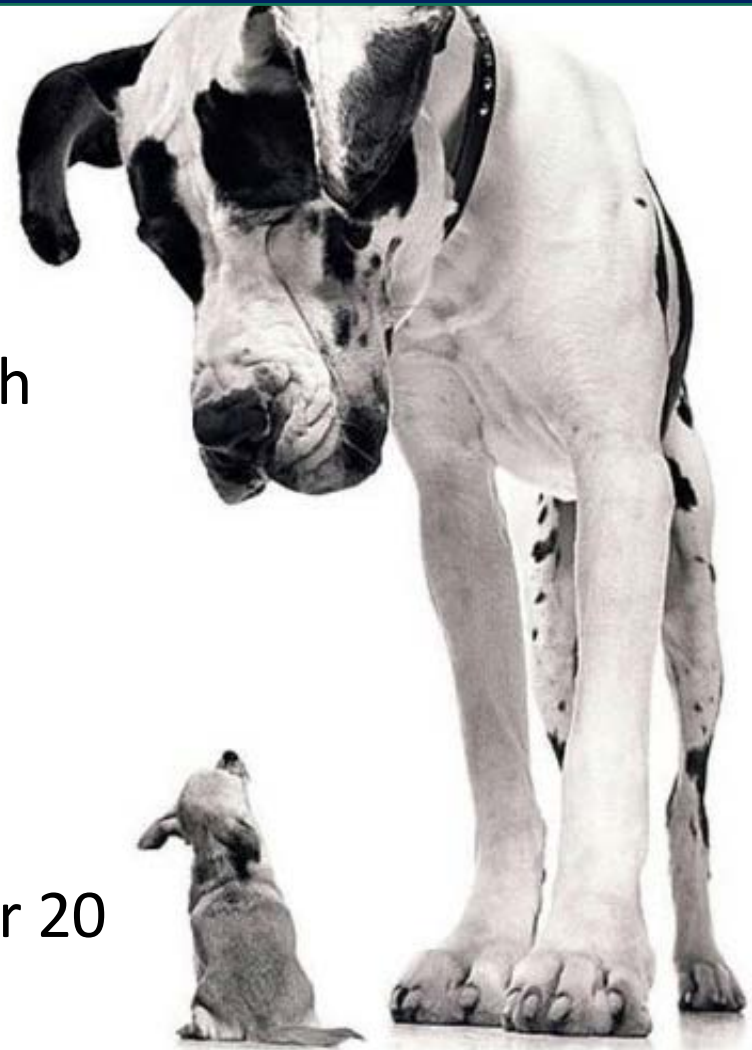
3% to 30%

10-fold disparity

VF witnessed (communities with over 20
witnessed VF arrests)

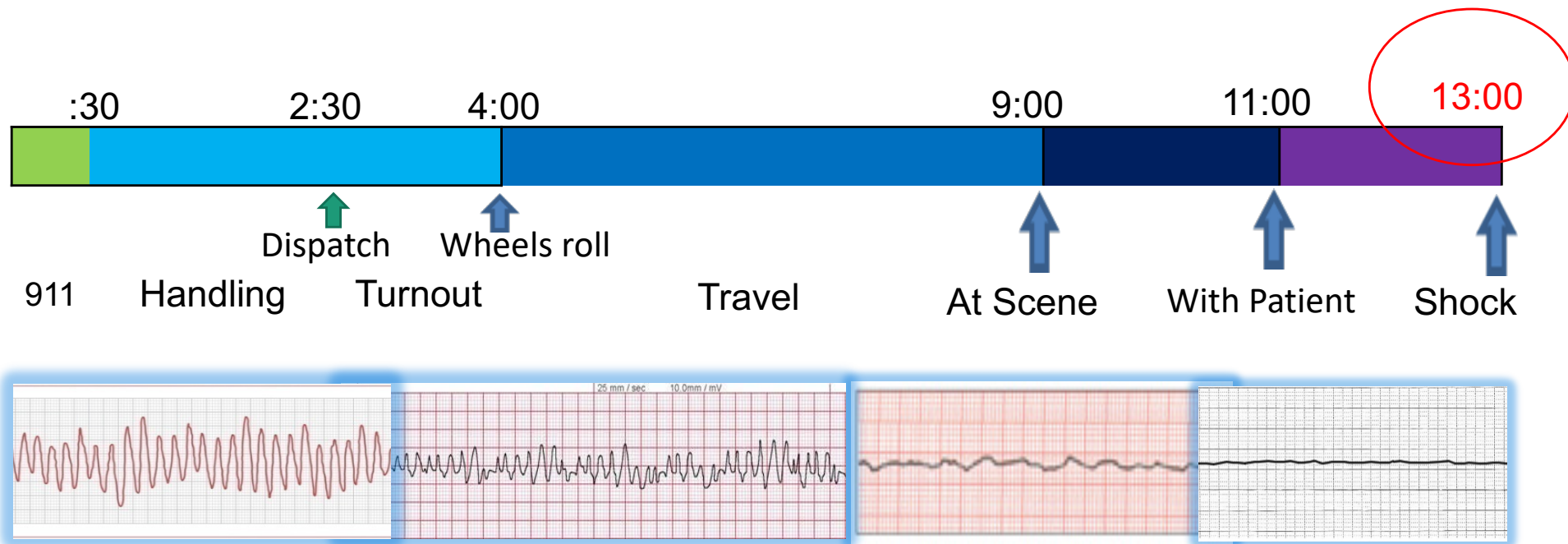
4% to 62%

15-fold disparity



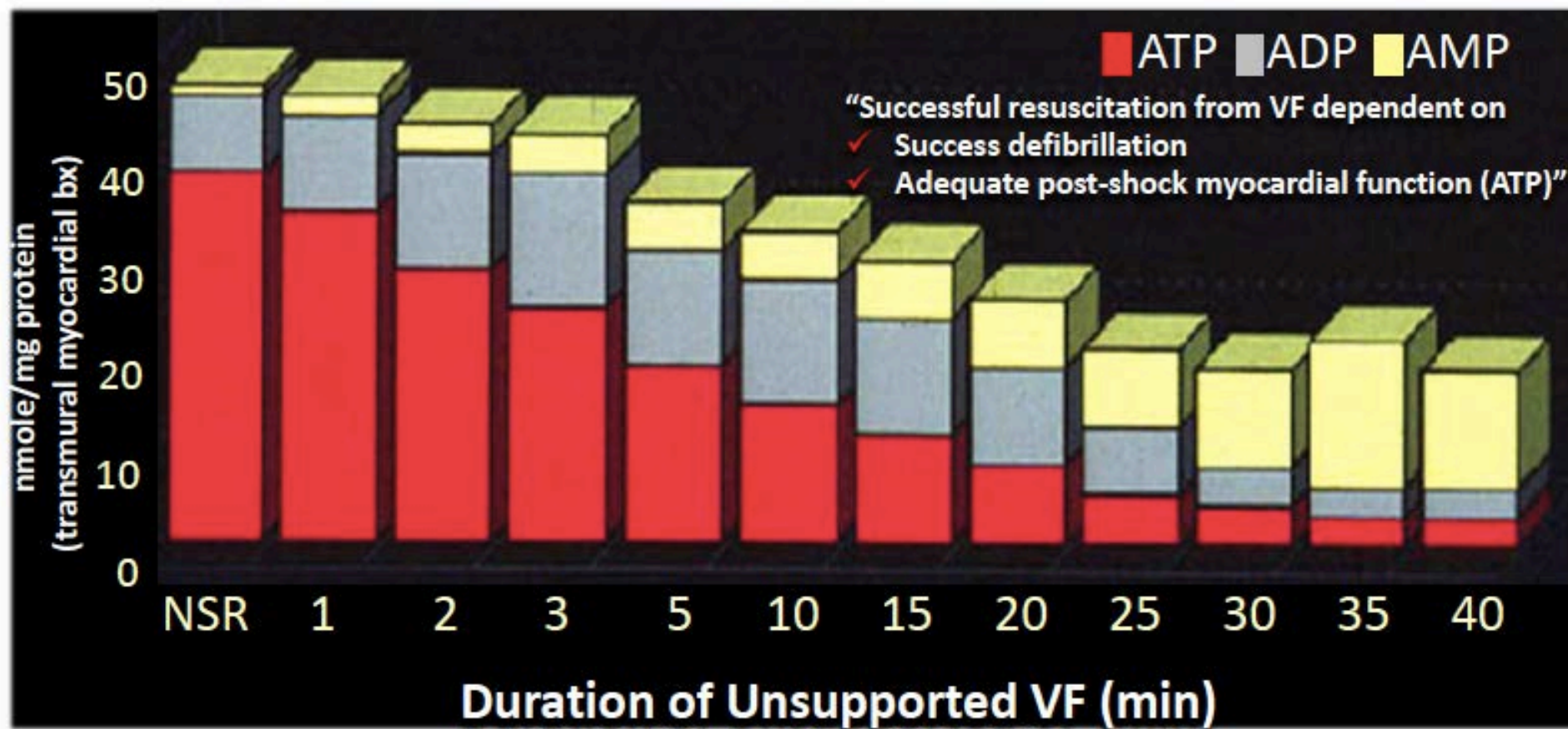
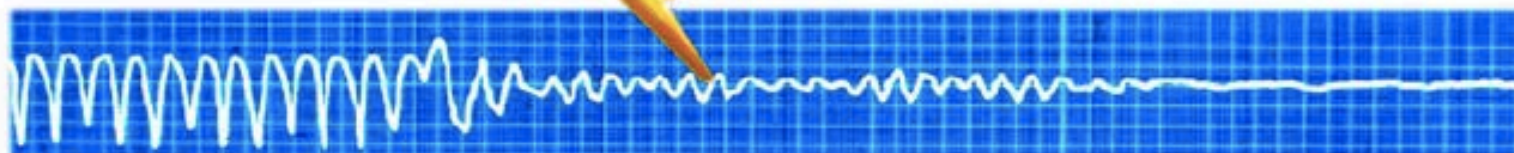
Time

Typical Urban Response

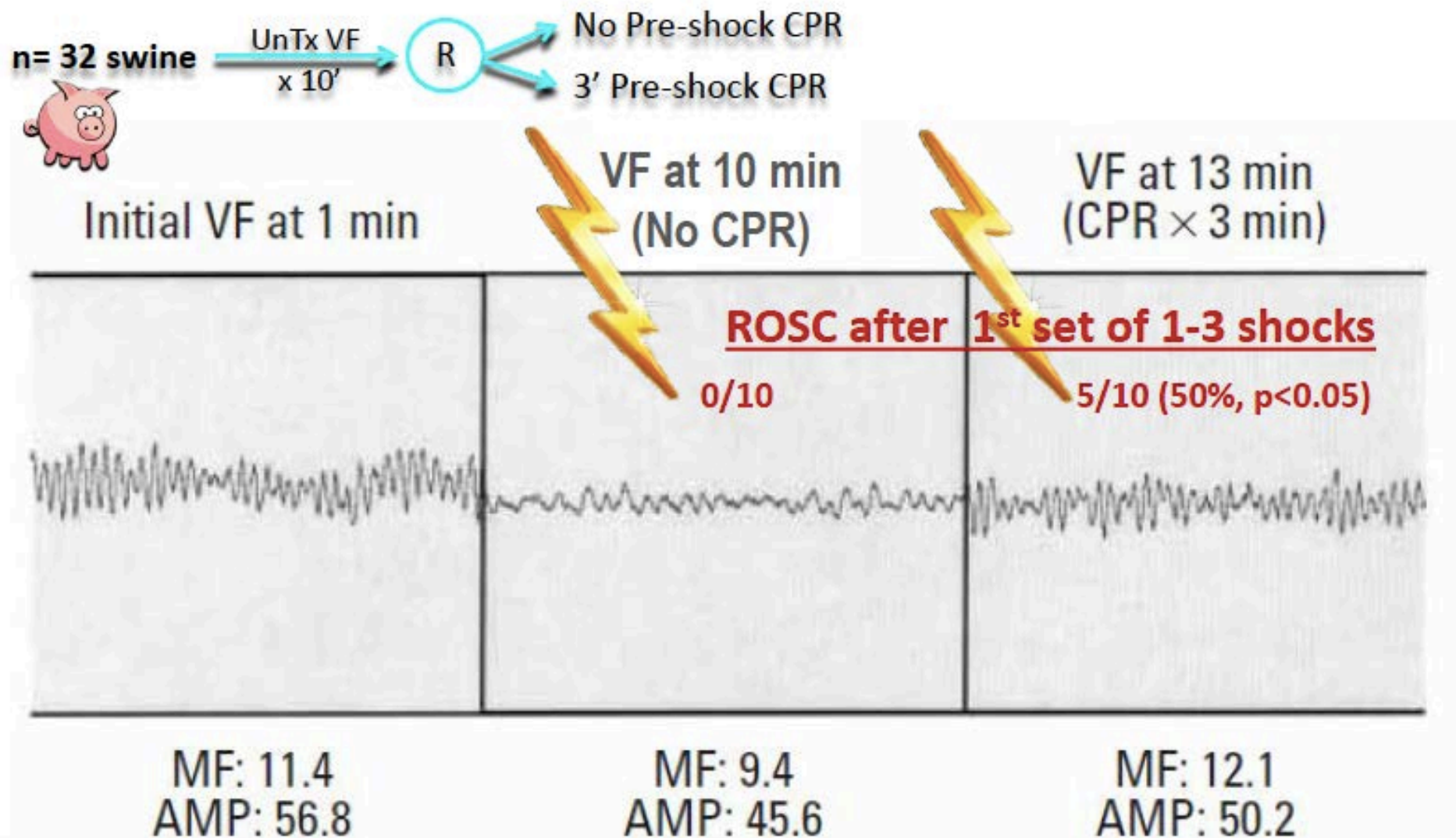


Adenosine Nucleotide Concentrations During VF

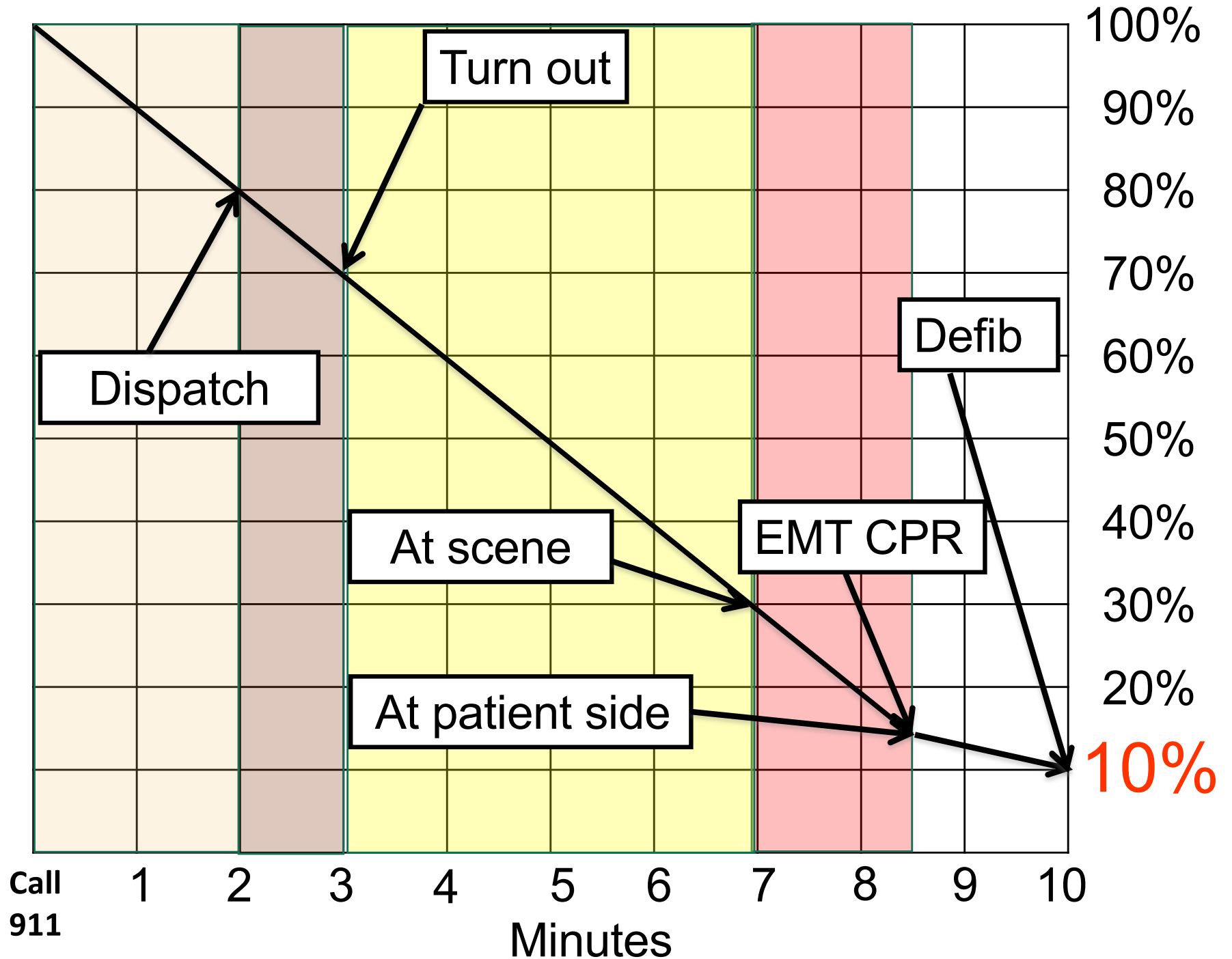
n = 10 swine (~10 samples/time period)



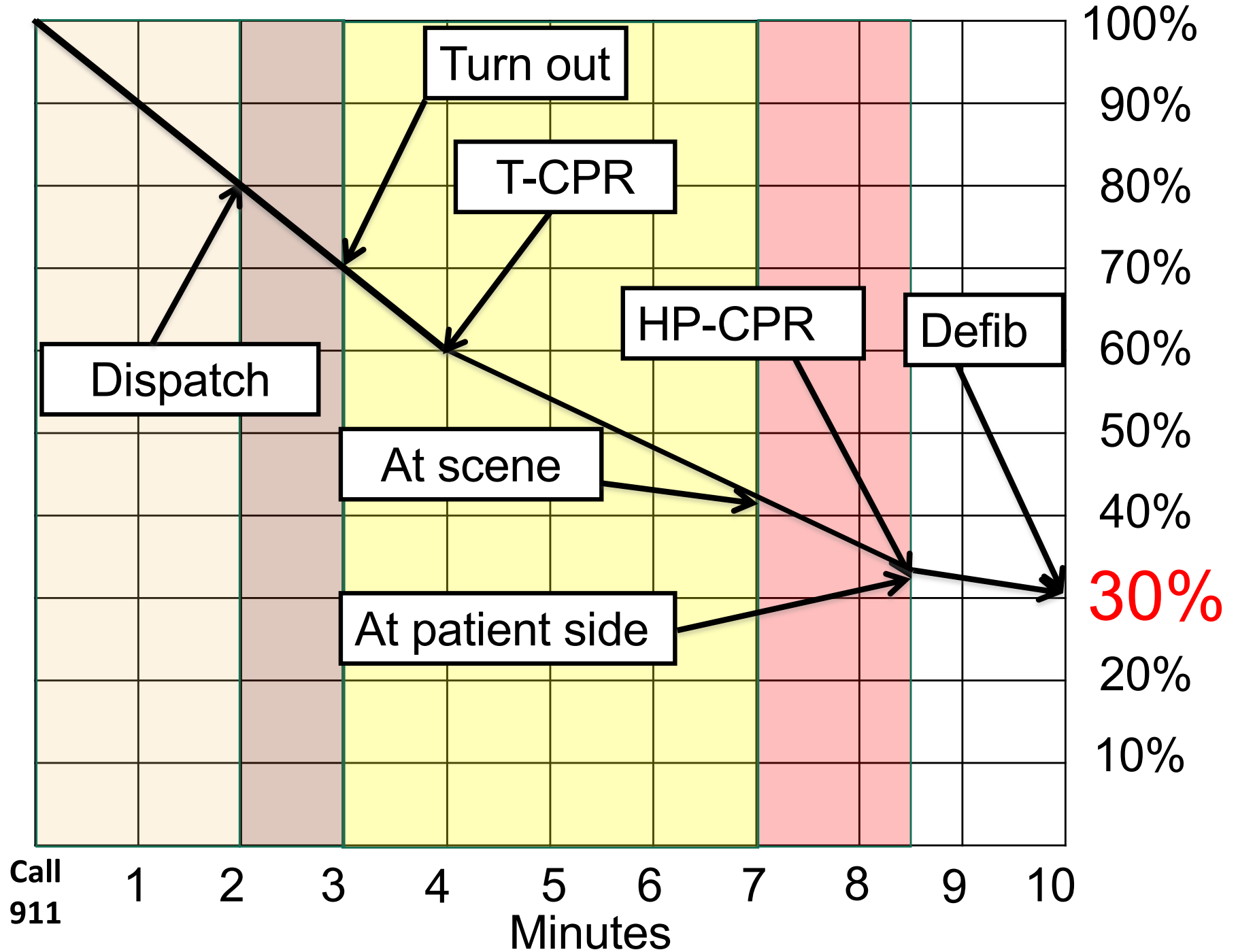
Changes in VF Waveform With and Without 3 Minutes of Pre-shock CPR



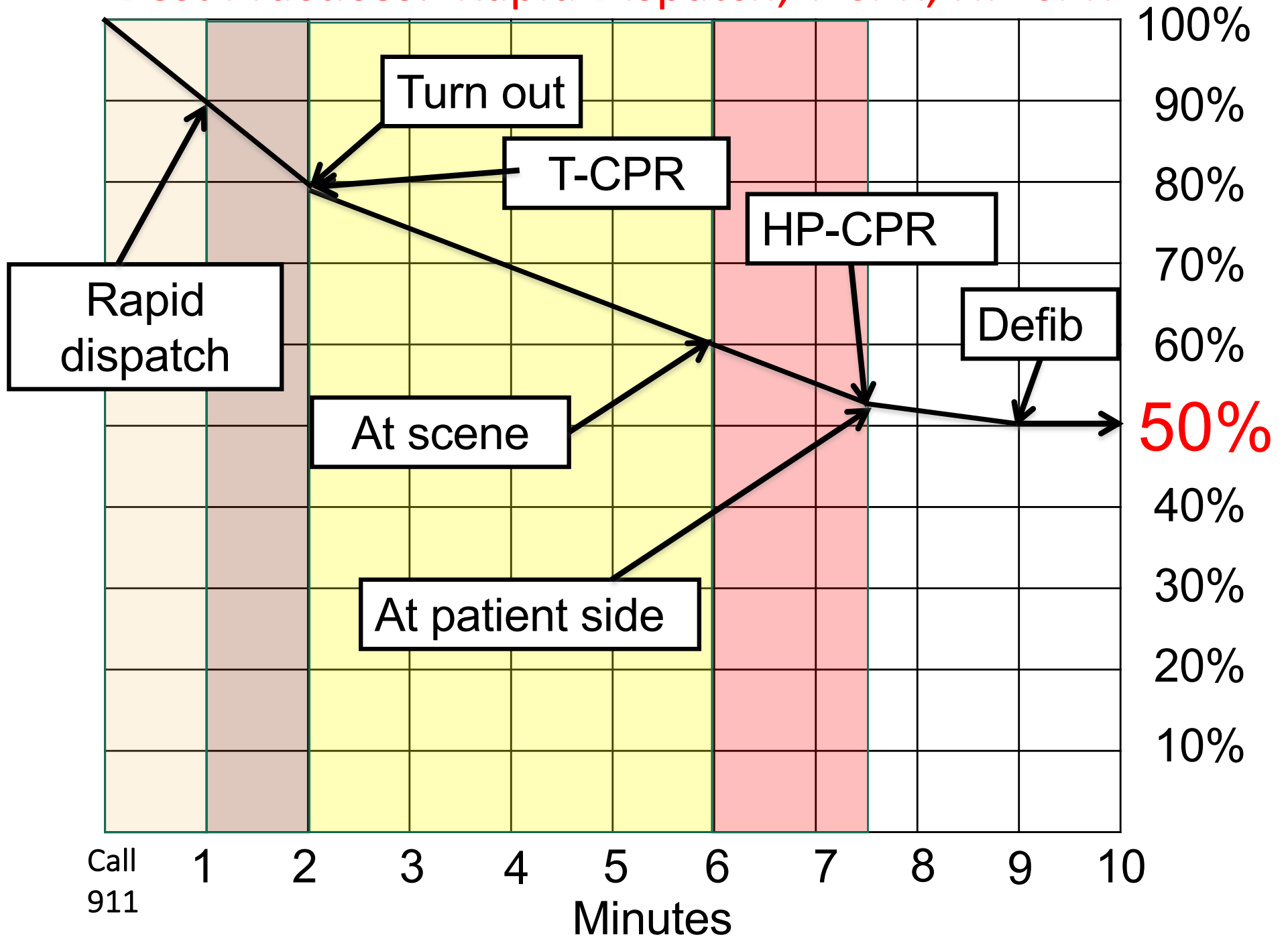
Under Performing: No T-CPR, no HP-CPR, no Rapid Dispatch



Average Performing: Delay in T-CPR, no Rapid Dispatch



Best Practices: Rapid Dispatch, T-CPR, HP-CPR



CPR/AED/Dispatch/PD Involvement

- CPR training
- Adding AED's
- Device app CPR notification
- Mass CPR training programs (stadiums, school events)
- PD response to cardiac arrests
- School CPR programs
- Expanded to Public Works/Environmental Services
- RQI hands on training
- RQI dispatch





Rapid response systems

The association of fire or police first responder initiated interventions with out of hospital cardiac arrest survival

Rama A. Salhi ^{a, b}, Stuart Hammond ^c, Jessica L. Lehrich ^d, Michael O'leary ^e, Neil Kamdar ^e, Christine Brent ^a, Carlos F. Mendes de Leon ^f, Peter Mendel ^g, Christopher Nelson ^g, Bill Forbush ^h, Robert Neumar ^a, Brahmajee K. Nallamothu ⁱ, Mahshid Abir ^{a, b, g}, The CARES Surveillance Group

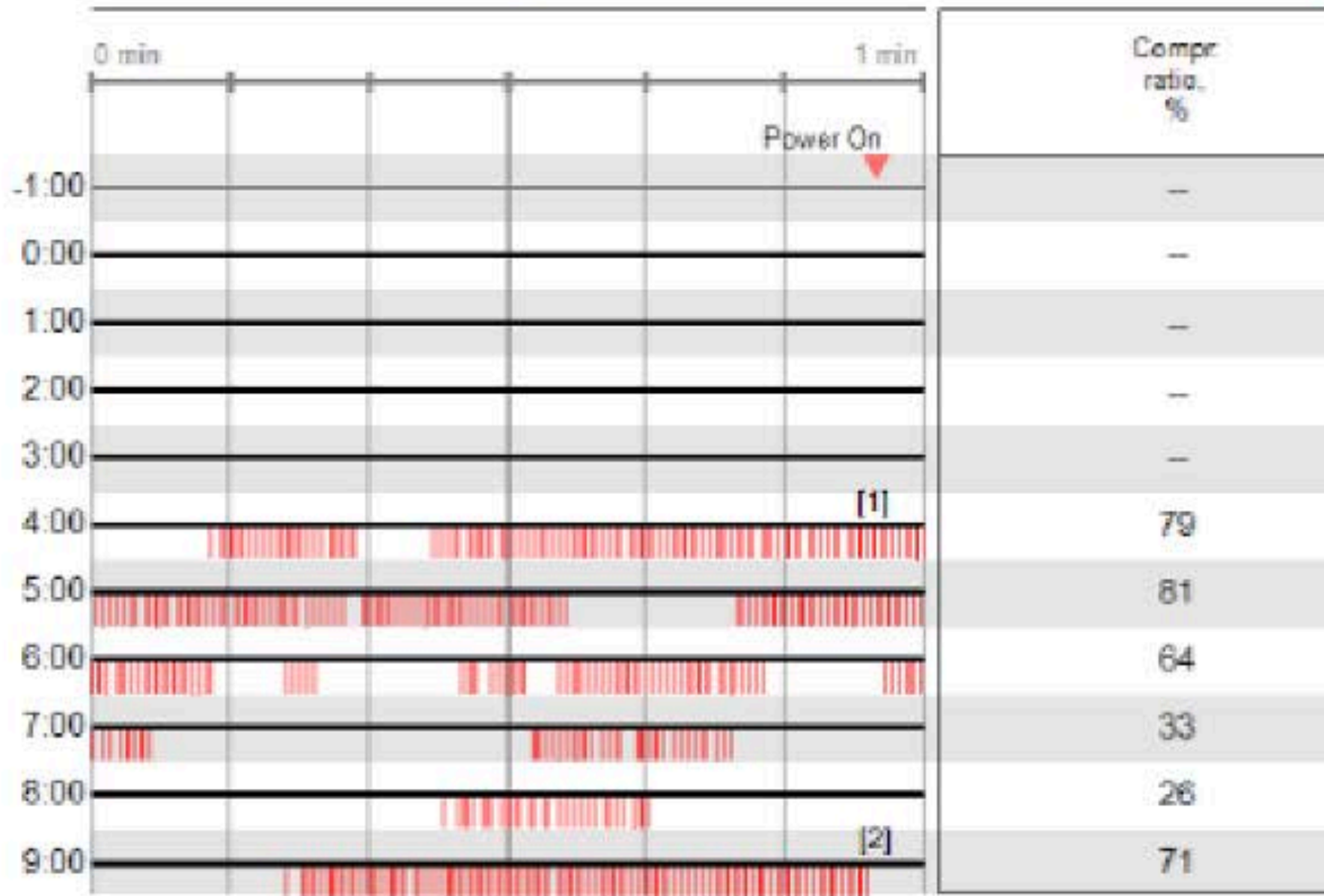
Results

Our cohort included 25,067 OHCA incidents.

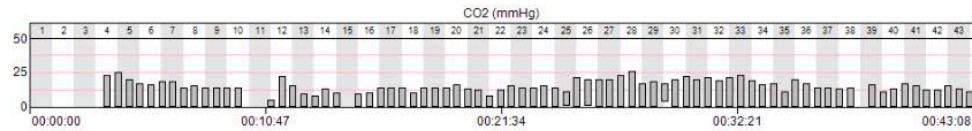
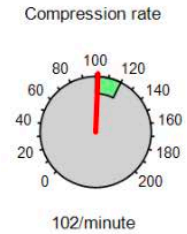
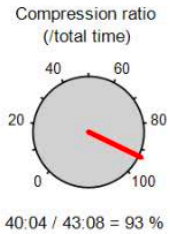
initiated CPR (aOR 1.01, CI 0.93–1.11). However, fire/police first responder interventions were associated with significantly higher odds of survival to hospital discharge and survival with good neurologic outcome (aOR 1.25, 95% CI 1.08–1.45 and aOR 1.40, 95% CI 1.18–1.65, respectively). Similar associations were seen when

CPR QUIK-VIEW

In



BEST EMS Cardiac Arrest Feedback Format



CPR QUIK-VIEW		Interval Statistics	
Time	Visual CPR Data	Compr. ratio, %	Compr. rate
0:00	Start	100	102
1:00		73	102
2:00		100	102
3:00		100	102
4:00		92	102
5:00		100	102
6:00		100	102
7:00		86	102
8:00		100	102
9:00		89	102
10:00		100	102
11:00		100	102
12:00		100	102
13:00		69	102
14:00		56	102
15:00		100	102
16:00		90	102
17:00		75	102
18:00		100	102
19:00		76	102
20:00		39	102



An American Heart Association®
and Laerdal Program

Step 1 ⇒

**Complete
Online Program**

Step 2 ⇒

**Pass
Skills Session**

Step 3 ⇒

**Obtain AHA BLS, ACLS
or PALS eCard**

Helps control labor and training costs

Skills training is integrated into the typical work shift, which means no additional OT expense is incurred.

Facilitates ongoing deliberate practice

Simulation-based mastery learning, implemented through low-dose, high-frequency quality improvement sessions that measure and verify competence.

Maintain AHA CPR credentials

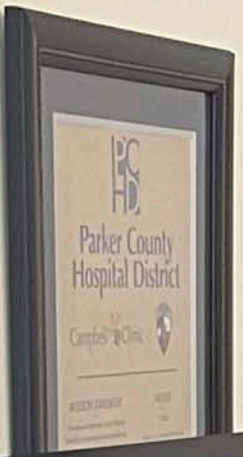
As part of the AHA digital resuscitation portfolio, RQI® is the preferred solution to uniquely and efficiently deliver safe and effective BLS, ALS and PALS.



CARDIAC ARREST SURVIVAL



PARKER COUNTY
HOSPITAL DISTRICT
EMS







CARDIAC ARREST SURVIVORS





CARDIAC ARREST SURVIVORS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

EMERGENCY MEDICAL SERVICES
EMS

The graphic features a stylized blue and white arrow pointing right, with a grid of 25 numbered boxes inside. Below the grid are logos for the Texas Department of Transportation and the State of Texas.





BEST EMS versus State/Nation

CARES Summary Report

Demographic and Survival Characteristics of OH

Non-Traumatic Etiology | Arrest Witness Status: All | Date of Arrest: 01/01/22-12/31/22

BEST EMS AGENCIES N=609	State (All Agencies) N=11028	National N=147736
----------------------------	---------------------------------	----------------------

Utstein¹ Survival (%)

N=70
38.6%

N=1037
31.2%

N=15087
30.7%

Utstein Bystander² Survival (%)

N=47
48.9%

N=623
34.3%

N=8856
34.3%

BEST EMS Jan 1, 2020 - May 26, 2023

Utstein Survival Report

All Agencies

Date of Arrest: From 01/01/2020 Through 05/26/2023

Resuscitations Attempted
1817

Non-Traumatic Etiology Survival Rates

Overall:	12.3% (1748)
Bystander Wit'd:	19.3%(610)
Unwitnessed:	6.0% (914)
Utstein ¹ :	37.5% (192)
Utstein Bystander ² :	42.7% (124)

Non-Traumatic Etiology
1748

Bystander Intervention Rates ³

CPR:	44.9% (1235)
Public AED Use:	25.1% (183)

Carrollton Fire Jan 1, 2020 - May 26, 2023

Utstein Survival Report

Carrollton Fire Rescue

Date of Arrest: From 01/01/2020 Through 05/26/2023

Resuscitations Attempted
352

Non-Traumatic Etiology Survival Rates

Overall:	9.0% (335)
Bystander Wit'd:	18.6%(97)
Unwitnessed:	3.6% (197)
Utstein ¹ :	46.2% (26)
Utstein Bystander ² :	50.0% (18)

Grapevine Fire Jan 1, 2020 - May 26, 2023

Utstein Survival Report

Grapevine Fire Department

Date of Arrest: From 01/01/2020 Through 05/26/2023

Resuscitations Attempted
152

Non-Traumatic Etiology Survival Rates

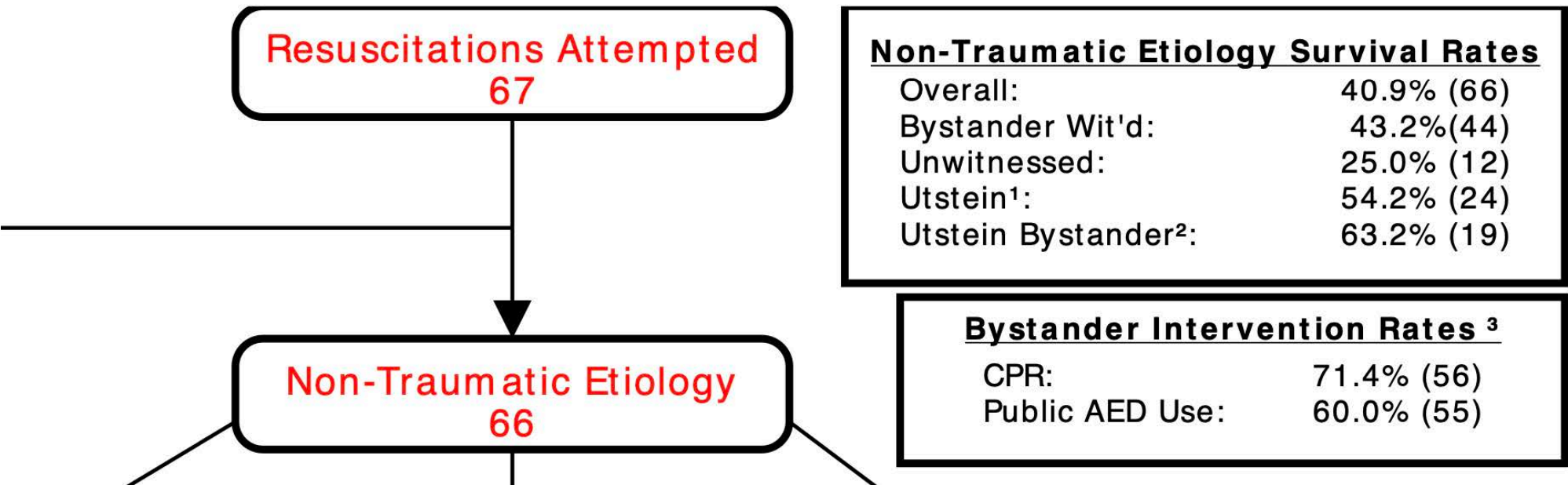
Overall:	15.1% (152)
Bystander Wit'd:	25.5%(55)
Unwitnessed:	11.1% (81)
Utstein ¹ :	53.3% (15)
Utstein Bystander ² :	62.5% (8)

DFW Airport Jan 1, 2020 - May 26, 2023

Utstein Survival Report

DFW Airport Department of Public Safety

Date of Arrest: From 01/01/2020 Through 05/26/2023



Medical/Trauma Arrest Checklist – Trauma Arrest

BLUNT TRAUMA ARREST

Pulseless/Apneic/Asystole—**STOP**

Pulseless/Apneic/Any rhythm but asystole—**STAY ON SCENE**

Focus:

- Stop hemorrhage
 - Manage airway
 - Volume resuscitation
 - Defibrillation if shockable rhythm
 - Bilateral needle decompression/finger thoracostomies
 - Pericardiocentesis or cardiac ultrasound views to treat and/or rule out cardiac tamponade
 - If no ROSC after 10 minutes—**STOP** **Confirm no heart motion with ultrasound if capable**
-
- NO ACLS Drugs indicated unless strong suspicion of medical etiology for arrest
 - Chest compressions can be delivered only after the above treatments have been focused on

Hangings, drownings, and asphyxiations should be treated as a Medical Cardiac Arrest



Medical/Trauma Arrest Checklist – Trauma Arrest

PENETRATING TRAUMA ARREST (HEAD)

Pulseless/Apneic/Asystole—**STOP**

Pulseless/Apneic/Any rhythm but asystole — **STAY ON SCENE**

Focus:

- Stop hemorrhage
- Chest Compressions
- Manage airway
- Volume resuscitation
- Defibrillation if shockable rhythm
- If no ROSC after 10 minutes—**STOP** **Confirm no heart motion with ultrasound if capable**

➤ NO ACLS Drugs indicated unless strong suspicion of medical etiology for arrest



Medical/Trauma Arrest Checklist – Trauma Arrest

PENETRATING TRAUMA ARREST (BODY)

Pulseless/Apneic/Asystole—**STOP**

Pulseless/Apneic/Any rhythm but asystole —**EARLY TRANSPORT**

Focus:

- Stop hemorrhage
 - Manage airway
 - Volume resuscitation
 - Defibrillation if shockable rhythm
 - Needle decompression/finger thoracostomy (chest/upper abdomen/upper back injury only)
 - Pericardiocentesis or cardiac ultrasound views to treat and/or rule out cardiac tamponade (thorax injury only)
-
- NO ACLS Drugs indicated unless strong suspicion of medical etiology for arrest
 - Chest compressions can be delivered only after the above treatments have been focused on



Stay on Scene

Why?

Vital Goals:

94%

SBP \geq 90

Body Cameras

You will be on video no matter what!

Initially not a fan!

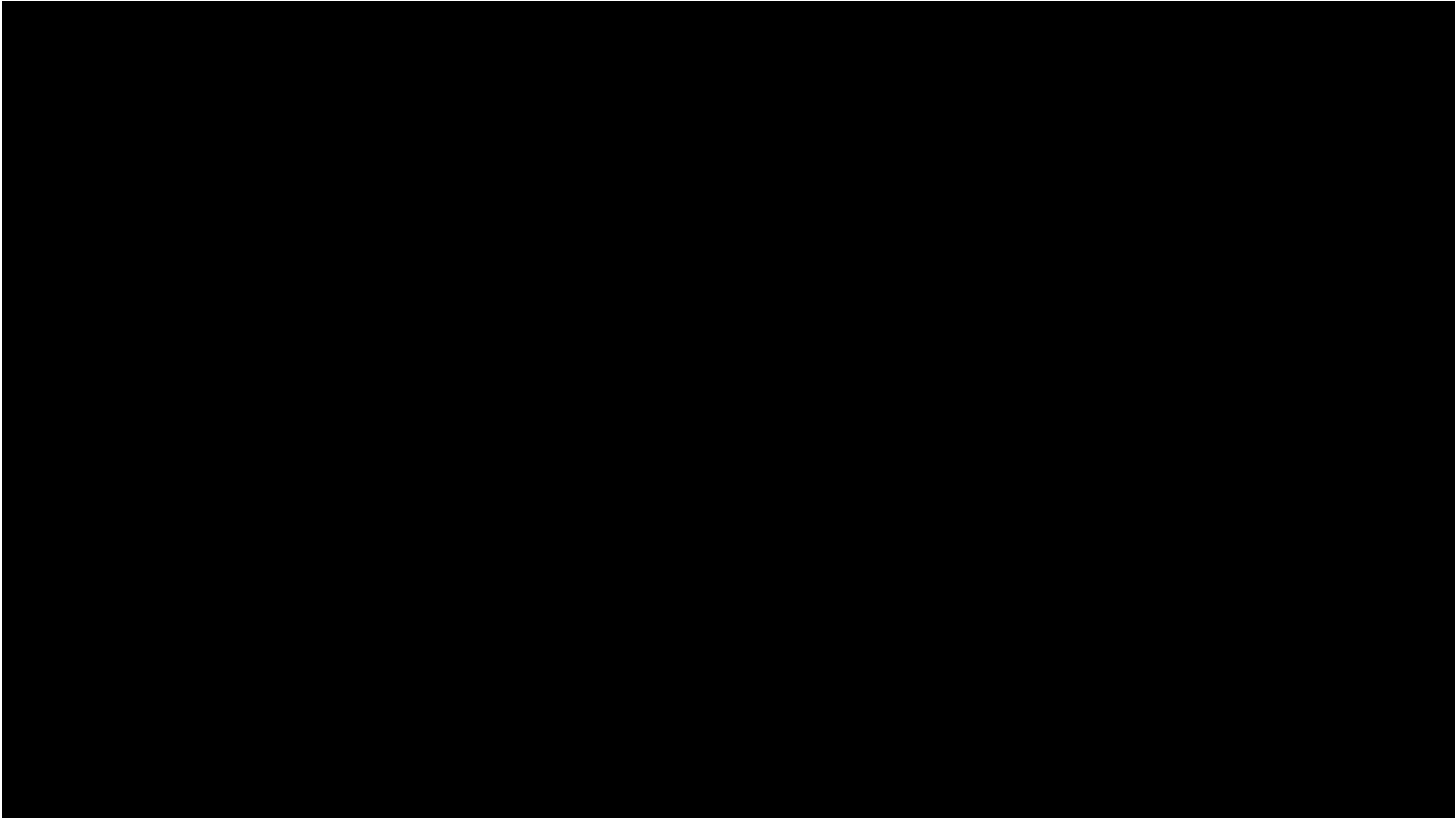
How do we use them?

What have we learned?

Not for finding fault, for improving!

2023-05-15 01:19:22 -0500
AXON BODY 3 X60A09864





County Wide Medical Director

- Collaboration/integration/replacement
- Team approach
- Med Control over PCHD and all FRO's
- Grant to increase EMT/Medics/CC
- Spread skilled care throughout county
- Unified CE
- County-wide HP-CPR training
- I-Gel/IV/IO/ND skill EMT
- Police buy in for CPR/AED

County Wide Medical Director

- Tahoe concept response
- MD Tahoe
- 80 hours Med Dir per month
- 85% critical care medics
- Vents, drips, advanced skills
- Difficult Airway Class
- All new medics checked off by Med Dir
- Cadaver lab 5x per year
- UNT HSC research collaboration











Professionally Staffed With Volunteers

CO
PCE



EMS PHYSICIAN

TEXAS
EXEMPT
157-0419
The Lone Star State

EMS

MD 01







Entire > 900 sq mile county taught HP-CPR in 6 weeks!





EXIT

EMT
MENT

PARAMEDIC



**THERE ARE NO SECRETS TO SUCCESS.
IT IS THE RESULT OF PREPARATION,
HARD WORK, AND LEARNING
FROM FAILURE.**