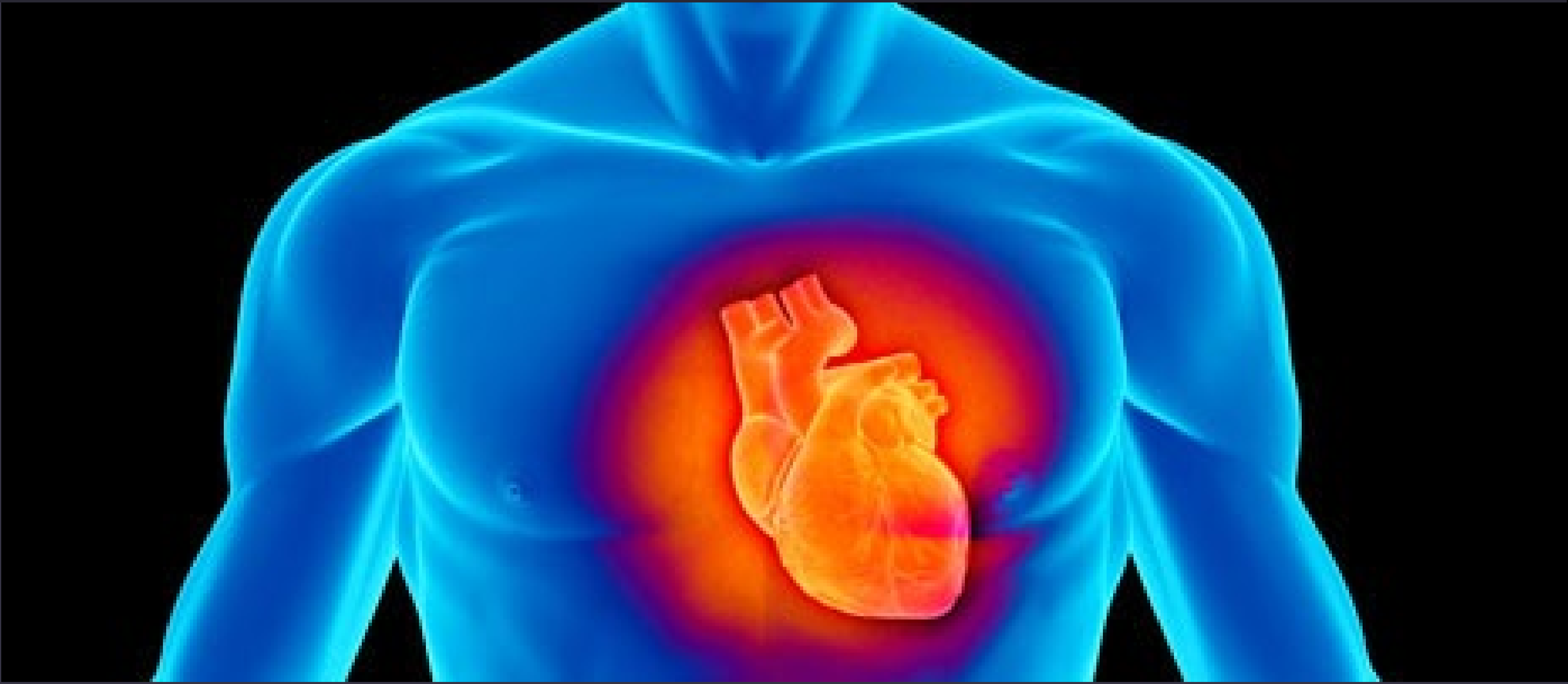
RESUSCITATION STUDIES YOU SHOULD KNOW ABOUT!



NATIONAL TEACHING INSTITUTE - 2019

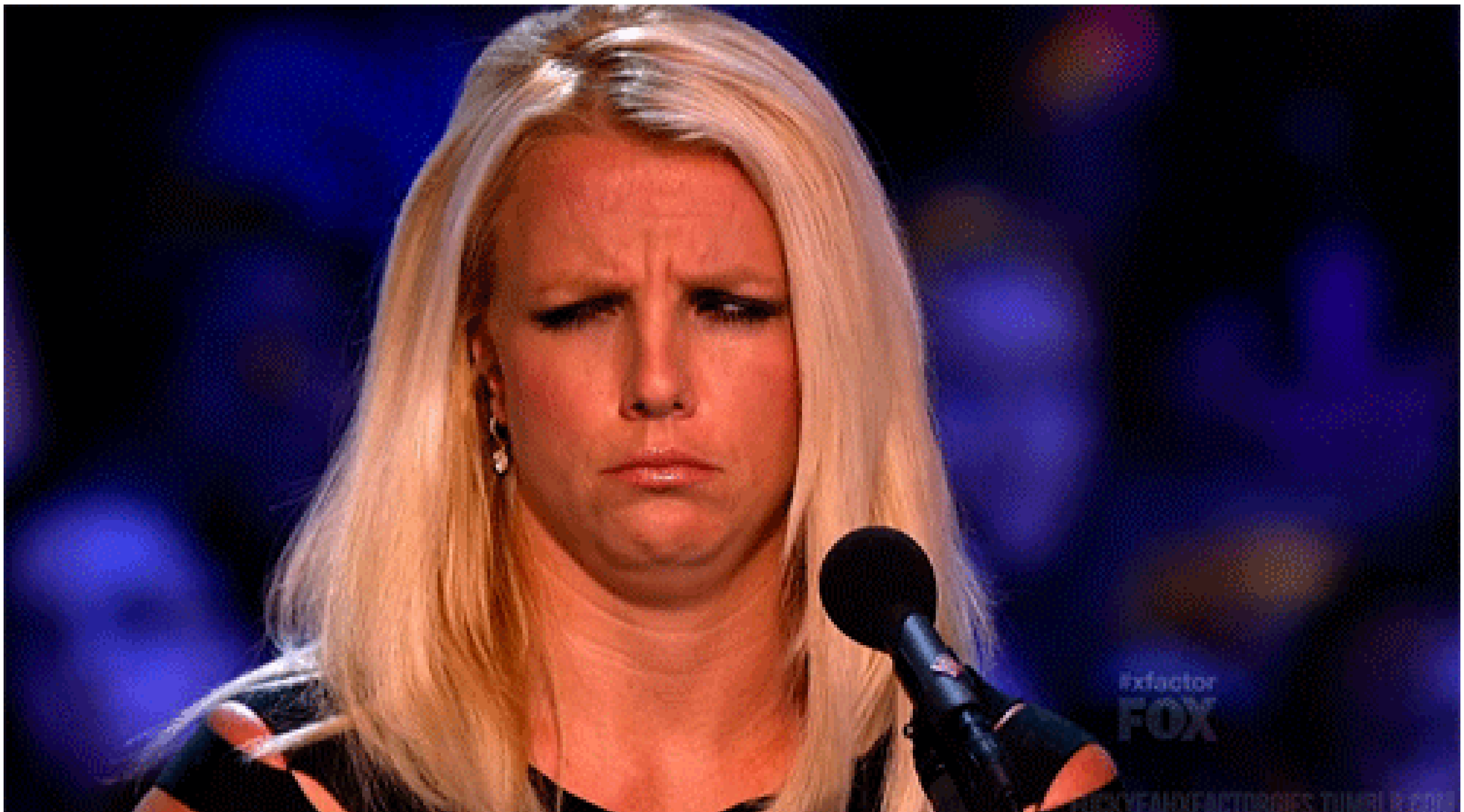
Nicole Kupchik MN, RN, CCNS, CCRN-K, PCCN-CMC

Objectives

- Discuss issues with CPR performance in hospitals
- Describe challenges to providing high quality CPR
- Discuss the data behind the use of mechanical CPR devices

Let's start with cardiac arrest basics…

In resuscitation, what matters?



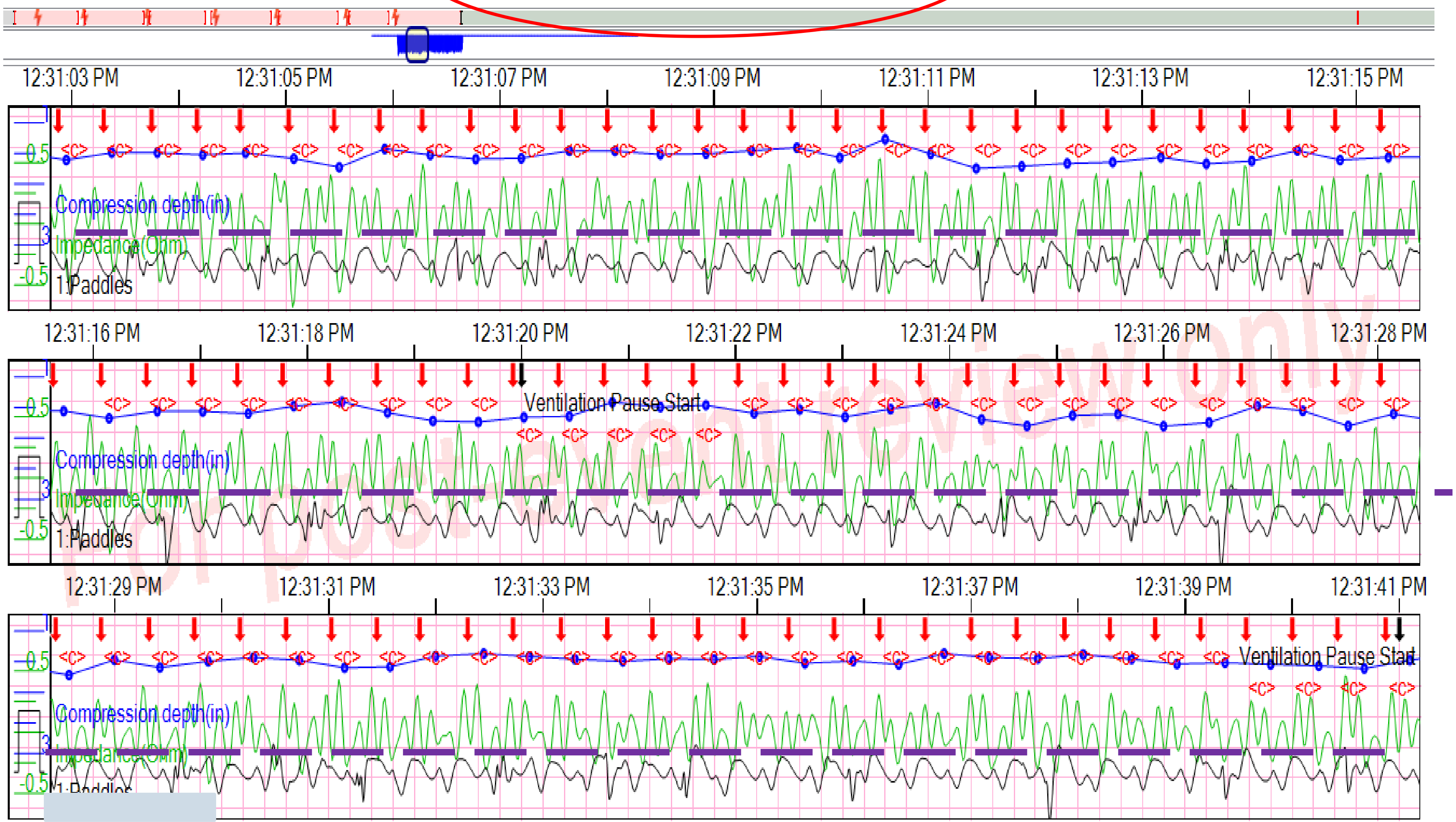
In resuscitation, what matters?

2015 Guidelines overview

- Chest compression rate 100 – 120/min
  - Depth 2 – 2.4 inches
- Minimize peri-shock pauses
- Do NOT over-ventilate!!!
- Utilize Capnography for ET placement, CPR quality, ROSC
- Medications:
  - Epinephrine 1 mg every 3 – 5 min
  - Amiodarone 300 mg IV for ventricular fibrillation

Depth with fast CPR rates

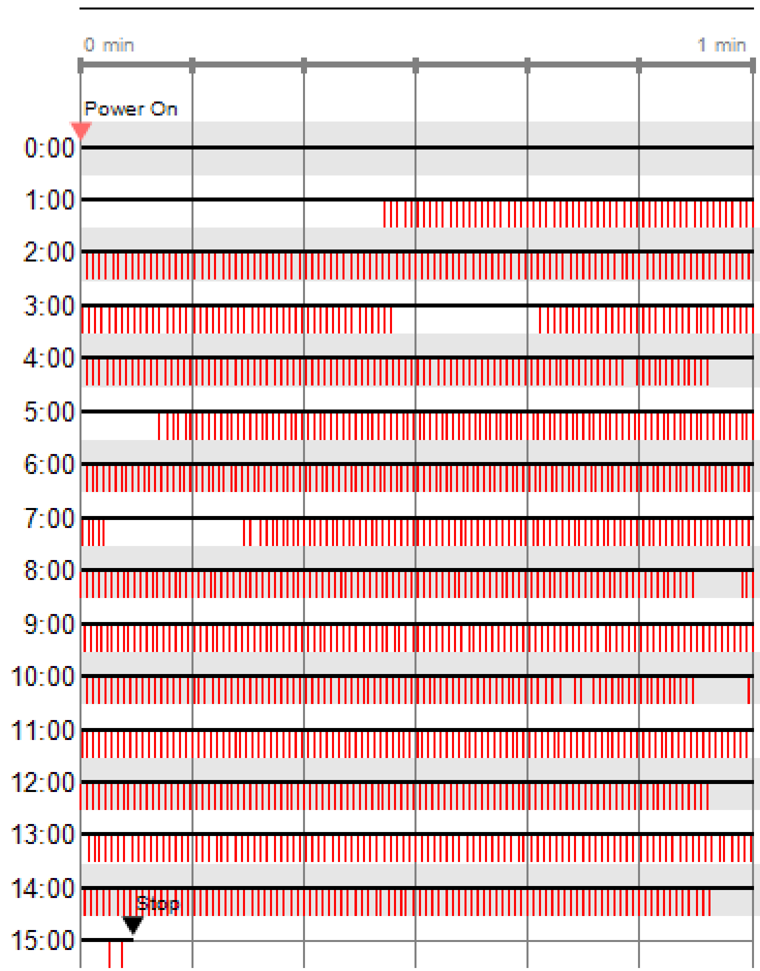
CC Rate 141



Minute by minute breakdown

Pauses over 10 sec = 4

CPR QUIK-VIEW



Interval Statistics

Compr. ratio, %	Compr. rate	Compr. depth	With target depth	Good compr.
--	--	--	--	--
56	104	1.8	14	14
100	105	1.9	38	38
79	104	1.5	--	--
94	107	1.5	--	--
89	118	1.4	--	--
100	118	1.2	--	--
81	116	1.8	9	7
94	114	1.7	1	1
100	110	1.6	1	1
93	109	1.7	8	7
100	112	1.9	35	35
94	110	1.8	3	3
100	105	2.0	63	57
95	106	1.8	35	35
47	--	0.6	--	--

2013 CPR Quality Consensus Statement

"Poor quality CPR should be considered
a preventable harm"

2018:
"Poor quality CPR *IS* a preventable harm"

Meany, Bobrow, Mancini et al (2013) Circulation 128(4):417-435

TEAM PERFORMANCE

What do top performing systems look like?

- Large variations in cardiac arrest survival
- GWTG Registry 2012 – 2014
- Identified top performing hospitals
- Geographically & academically diverse hospitals
- Top, middle & bottom quartiles in survival
- On-site in-depth interviews with clinical staff at 9 hospitals:
  - Nurses (45.6%)
  - Physicians (17.1%)
  - Other clinical staff (17.1%)
  - Administration (20.3%)

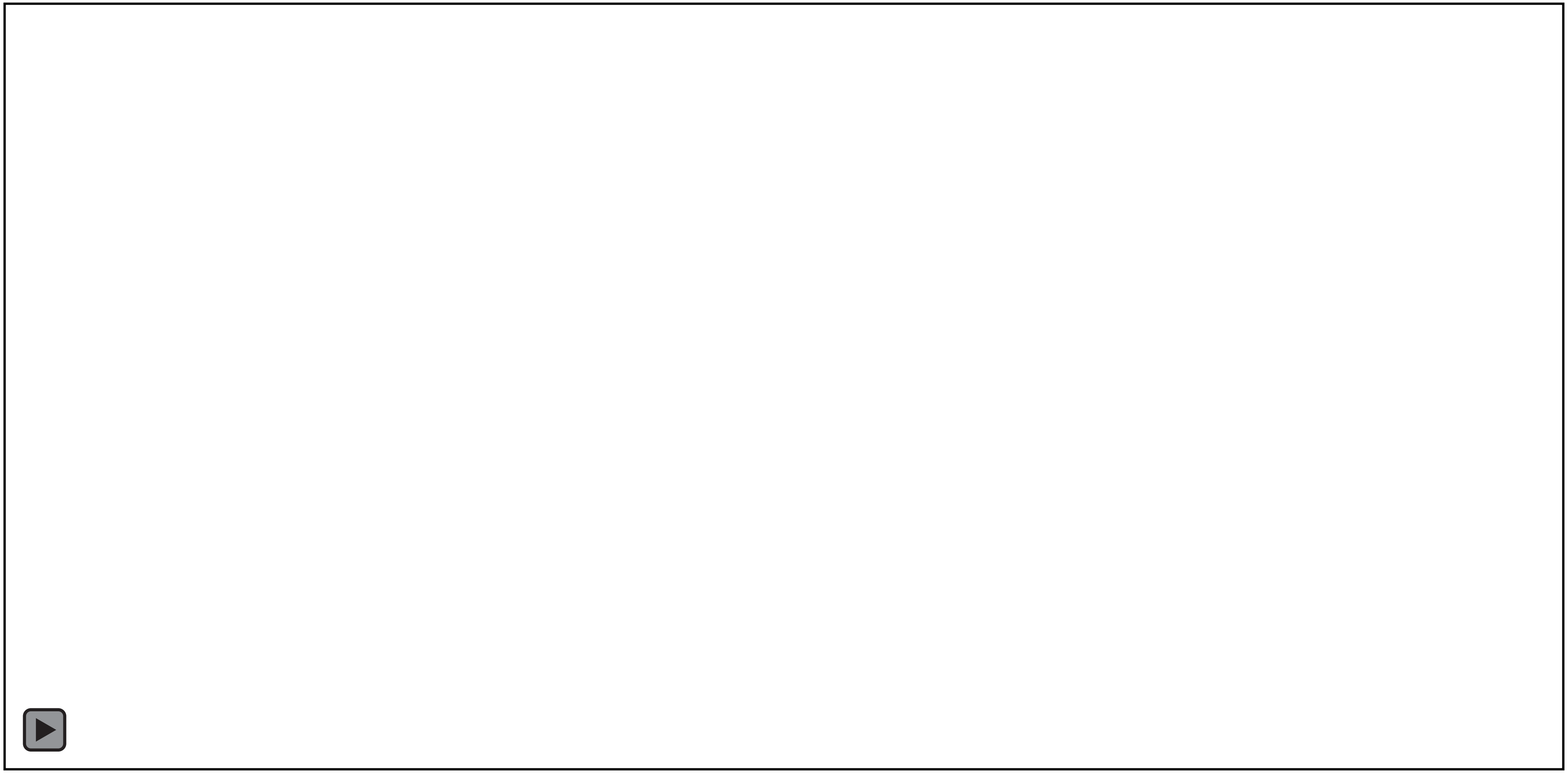
Nallamothu et al (2018) Circulation; 138:154-163.

Top performing systems had 4 things in common:

1) Team design
2) Team composition & roles
3) Communication & leadership during the arrest
4) Training & Education

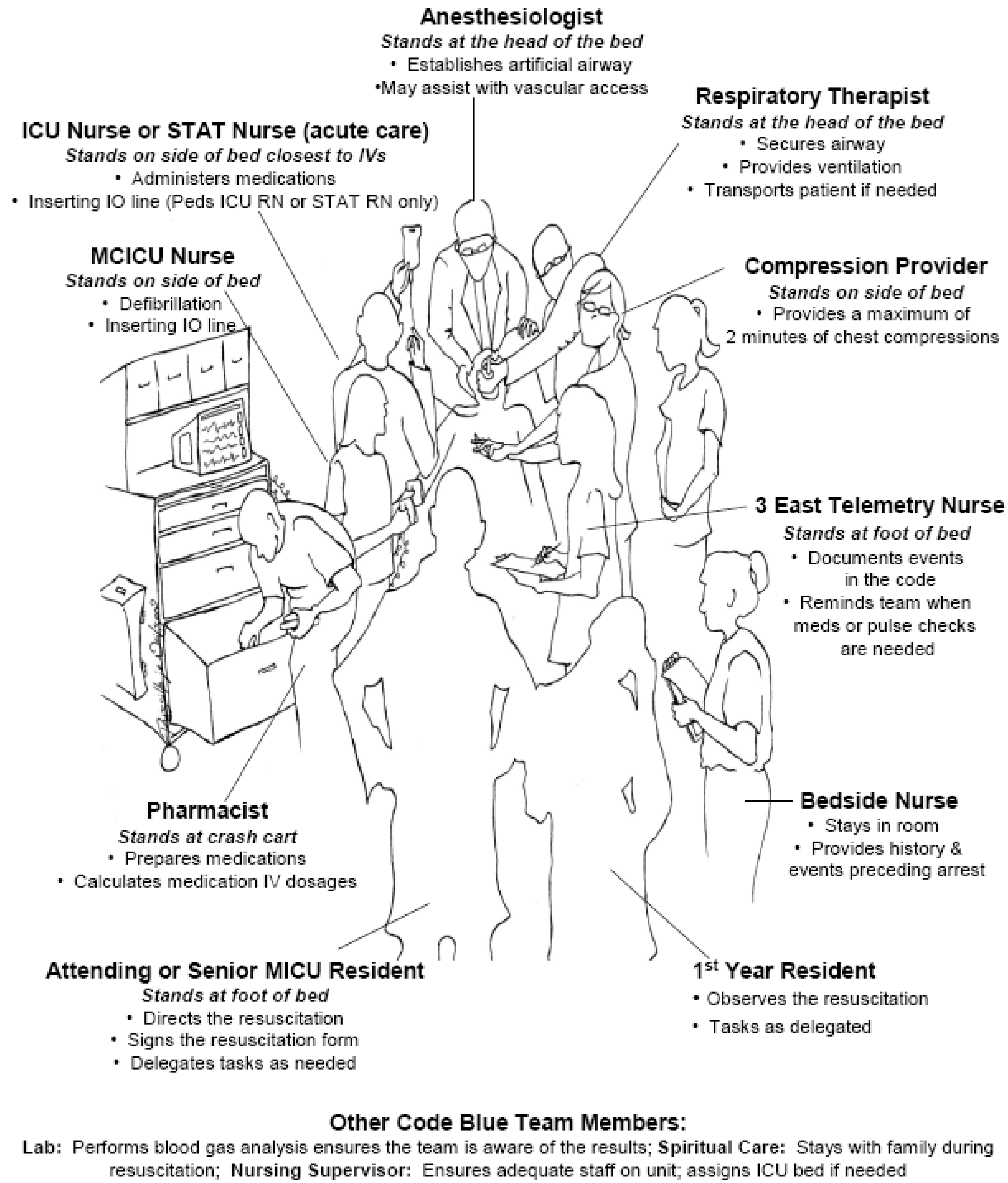
Nallamothu et al (2018) Circulation; 138:154-163.

Are humans as important as Formula One?



High Performance Team

- Clear team leader
- Understand not only your role, but the role of others on the team
- Anticipate what needs to happen next



Recommendations:

I mean the days of, you know, letting the nursing student or the paramedic student do the CPR, they just… they don't really happen anymore.

—Emergency Medicine Nurse; Hospital G; Top-Performing

In contrast, a bottom-performing hospital valued this skill less and suggested it was easily performed by less experienced providers.

We teach the techs that they can do compressions in code situations. If we have nursing students, we'll let them do compressions. We have plenty of people to rotate through in general so we'll rotate anyone through to do compressions.

—Nursing Education; Hospital F; Bottom-Performing

Last, crowd control was universally considered a problem because of the arrival of nonteam members.

Our biggest problem is too many people show up… We have codes where there's 17 to 22 people who respond…So sometimes it's difficult determining who's in charge of this code…

—Nursing Supervisor; Hospital I; Bottom-Performing

esuscitation Teams

Recommenda

nould establish dec
n-hospital cardiac a

nould ensure the p
iplines during in-h
hysician, nursing, r
macy expertise.

should develop syste
while ensuring the av
as needed.

should define clear r
bilities of team memb
n-hospital cardiac arre
ed in the early minute
nclude a focus on cor
mpressions, airway m
ous access.

should encourage th
nes that improve com
op communication) a
across multiple discipl
ication breaks down,
ystem in place to corr
being punitive.

ip during in-hospital
focus. Identifying hig
d leaders within resus
for successful teamw

should implement m
gular and unschedul
atient rooms and high-risk areas; (3)
iplinary; and (4) include post–mock code
g.

Top-performing hospitals also tended to have clearly defined roles and responsibilities for team members during an IHCA.

Fifteen years ago when I started it was a free for all…. So when (Medical Director) took over and, and kind of structured everything…You just show up and you know what you're supposed to do, and there's no screaming and there's no yelling.

—Critical Care Nurse; Hospital G; Top-Performing

At non–top-performing hospitals, specific roles and responsibilities of members were less clear, even well into the response, generating variable degrees of distress.

Very honestly things are more chaotic…I just feel a different level of anxiety when you come to these codes and roles are not always as clearly defined.

—Critical Care Attending Physician; Hospital E; Middle-Performing

It's kind of situation by situation…Respiratory always goes right to the airway to start with the airway, which is intuitive, and then in terms of the other staff, it just kind of depends. They seem to be comfortable assigning their own roles…

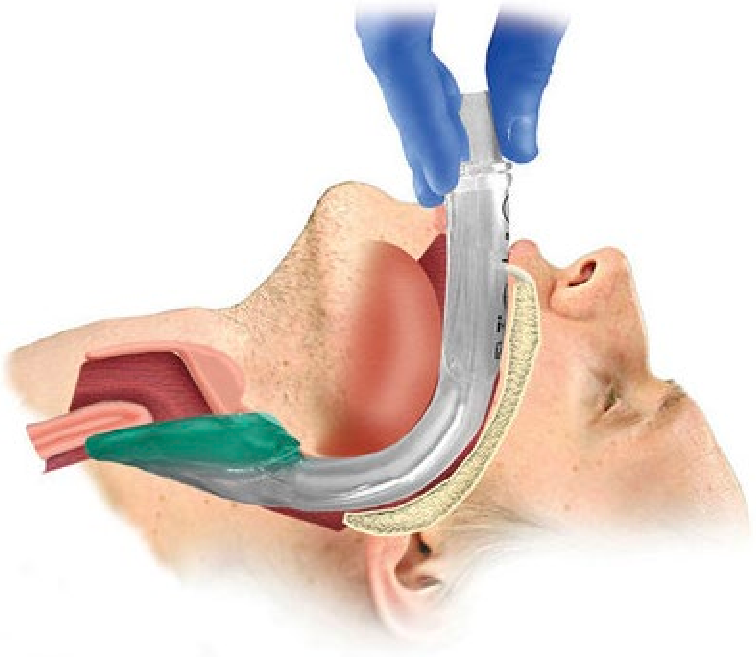
—Emergency Medicine Physician; Hospital B; Bottom-Performing

Nallamothu et al (2018) Circulation; 138:154-163.

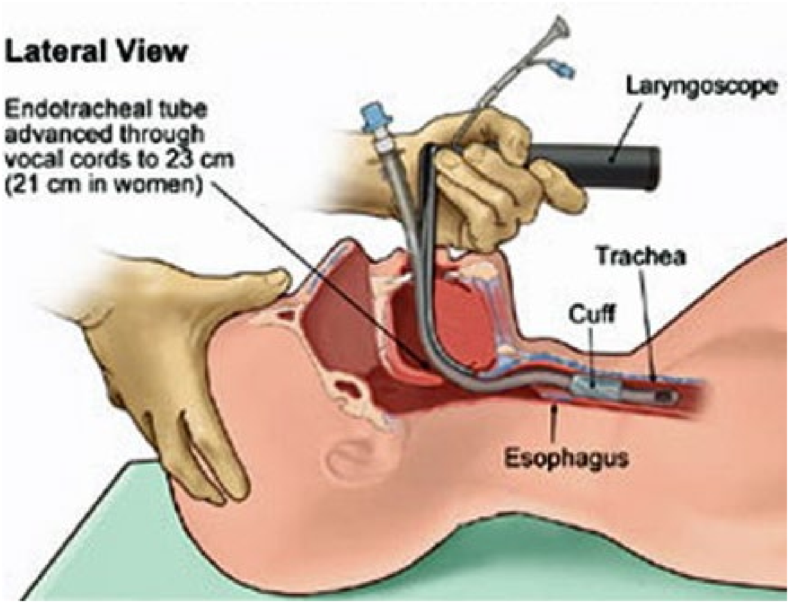
ADVANCED AIRWAY PLACEMENT

How should EMS manage airways?

- Tracheal intubation with ETT or laryngeal airways?



vs.



The PART Trial

- **P**ragmatic **A**irway **R**esuscitation **T**rial
- NIH funded
- 3,004 OHCA needing airway placement
- 27 EMS agencies, Randomized cross-over study
  - EMS agency assigned to LG for 3 – 5 months, then ETI alternating

Success rates:

- 90.3% Laryngeal intubation
- 51.6% Endotracheal intubation

Wang, H. et al. (2018) JAMA 320(8)

Findings:

Table 1. Characteristics of Patients Included in Intention-to-Treat Population

Characteristic	Laryngeal Tube (n = 1505)	Endotracheal Intubation (n = 1499)
Age, median (IQR), y	64 (53-76)	64 (53-76)
Male, no./total No. (%)	928/1503 (61.7)	901/1499 (60.1)
Witnessed arrest, no./total No. (%)	n = 1357	n = 1399
EMS witnessed	180 (13.3)	179 (12.8)
Bystander witnessed	511 (37.7)	529 (37.8)
Not witnessed	666 (49.1)	691 (49.4)
Unknown[a]	148 (9.8)	100 (6.7)
Bystander chest compressions, no./No. (%)	n = 1258	n = 1279
Yes	698 (55.5)	709 (55.4)
No	560 (44.5)	570 (44.6)
Unknown[a]	247 (16.4)	220 (14.7)
Time from dispatch to first arrival of EMS		
Median (IQR), min	5.0 (3.9-6.3)	5.3 (4.1-6.8)
≤4 min, no./total No. (%)	408/1444 (28.3)	305/1405 (21.7)
Unknown	61 (4.1)	94 (6.3)
Time between EMS arrival and start of chest compressions		
Median (IQR), min	2.1 (1.1-3.8)	2.1 (1.0-3.7)
≤10 min, no./total No. (%)	1243/1347 (92.3)	1189/1279 (93.0)
First electrocardiogram rhythm, no./total No. (%)		
Shockable rhythm (ventricular fibrillation, ventricular tachycardia, or delivery of AED shock)	301 (20.0)	270 (18.0)
Nonshockable (asystole, pulseless electrical activity, or AED nonshockable)	1160 (77.1)	1197 (79.9)
Other	44 (2.9)	32 (2.1)
Epinephrine administered before hospital arrival, no./total No. (%)	1385 (92.0)	1405 (93.7)
Compliance with assigned airway intervention, no./total No. (%)[b]	1437 (95.5)	1360 (90.7)
Transported to hospital, no./total No. (%)	906 (60.2)	889 (59.3)
Hospital procedures, no./total No. (%)[c]		
Therapeutic hypothermia	242/460 (52.6)	185/400 (46.3)
Coronary catheterization	109/460 (23.7)	73/400 (18.3)
Patients per randomization cluster[d]		
Mean	116	115
Median (range)	94 (3-314)	66 (12-382)

Wang, H. et al. (2018) JAMA 320(8)

The PART Trial Results

Table 3. Out-of-Hospital and In-Hospital Adverse Events[a]

Characteristic	Laryngeal Tube (n = 1505)	Endotracheal Intubation (n = 1499)	Difference, % (95% CI)	*P* Value
Out-of-Hospital Adverse Events				
Multiple (≥3) insertion attempts[b]				
Initial airway	6/1353 (0.4)	18/1299 (1.4)	−0.9 (−1.7 to −0.2)	.01
Across all airways	61/1353 (4.5)	245/1299 (18.9)	−14.4 (−17.0 to −11.7)	<.001
Unsuccessful insertion[b]				
First airway technique	159/1353 (11.8)	573/1299 (44.1)	−32.4 (−35.6 to −29.1)	<.001
All airway techniques	78/1353 (5.8)	111/1299 (8.5)	−2.8 (−4.8 to −0.8)	.01
Unrecognized airway misplacement or airway dislodgement	10/1353 (0.7)	24/1299 (1.8)	−1.1 (−2.0 to −0.3)	.01
Inadequate ventilation	25/1353 (1.8)	8/1299 (0.6)	1.2 (0.3 to 2.1)	.01
In-Hospital Adverse Events				
Pneumothorax (first chest x-ray)[c]	17/485 (3.5)	30/428 (7.0)	−3.6 (−6.5 to −0.7)	.02
Rib fractures (first chest x-ray)[c]	16/485 (3.3)	30/428 (7.0)	−3.8 (−6.9 to −0.7)	.01
Oropharyngeal or hypopharyngeal injury (first 24 h)[d]	1/460 (0.2)	1/400 (0.3)	0 (−0.7 to 0.6)	.92
Airway swelling or edema (first 24 h)[d]	5/460 (1.1)	4/400 (1.0)	0.1 (−1.3 to 1.4)	.90
Pneumonia or aspiration pneumonitis (first 72 h)[d]	120/460 (26.1)	89/400 (22.3)	3.7 (−2.1 to 9.6)	.21

Wang, H. et al. (2018) JAMA 320(8)

The PART Trial Results

Table 2. Outcomes of Patients Included in the Primary and Secondary Analyses

Characteristic	No. (%) Laryngeal Tube (n = 1505)	No. (%) Endotracheal Intubation (n = 1499)	Difference, % (95% CI)[a]	P Value
Primary Outcome				
Survival to 72 h (intention-to-treat population)	275 (18.3)	230/1495 (15.4)	2.9 (0.2 to 5.6)	.04
Secondary Outcomes				
Return of spontaneous circulation on emergency department arrival	420 (27.9)	365 (24.3)	3.6 (0.3 to 6.8)	.03
Survival to hospital discharge	163/1504 (10.8)	121/1495 (8.1)	2.7 (0.6 to 4.8)	.01
Favorable neurologic status at discharge (Modified Rankin Scale score ≤3)	107/1500 (7.1)	75/1495 (5.0)	2.1 (0.3 to 3.8)	.02
Modified Rankin Scale score	n = 1500	n = 1495		
0-No symptoms	17 (1.1)	14 (0.9)		
1-No significant disability	32 (2.1)	29 (1.9)		
2-Slight disability	22 (1.5)	12 (0.8)		
3-Moderate disability	36 (2.4)	20 (1.3)		
4-Moderately severe disability	26 (1.7)	24 (1.6)		
5-Severe disability	26 (1.7)	22 (1.5)		
6-Dead	1341 (89.4)	1374 (91.9)		
Additional Analyses				
Per-protocol analysis-survival to 72 h	263/1437 (18.3)	209/1356 (15.4)	2.9 (0.1 to 5.7)	.045
Intention-to-treat post hoc adjusted analysis[b]			2.1 (−0.5 to 4.8)	.11
Per-protocol post hoc adjusted analysis[b]			2.3 (−0.4 to 5.1)	.09

[a] For the primary analysis, the estimated difference in 72-hour survival accounted for interim monitoring and clustering via robust standard errors. All other comparisons accounted for clustering.

[b] Post hoc analyses adjusted for age, sex, rhythm, response time, witness status, and bystander chest compressions. A total of 163 patients were omitted from post hoc models due to missing data.

Wang, H. et al. (2018) JAMA 320(8)

Take home points…

"Our research revealed that sudden cardiac arrest patients who received the newer & easier to use laryngeal tube as the initial airway, had higher survival rate than those individuals who were randomized to an initial strategy of traditional endotracheal intubation.

Based on these results, we estimate that EMS providers could **save an additional 10,000-plus lives a year**,"

-Dr. Mohammed Daya

Source: https://news.ohsu.edu/2018/05/16/ems-providers-could-save-an-additional-10-000-lives-a-year-using-newer-breathing-tube

Limitations to the study:

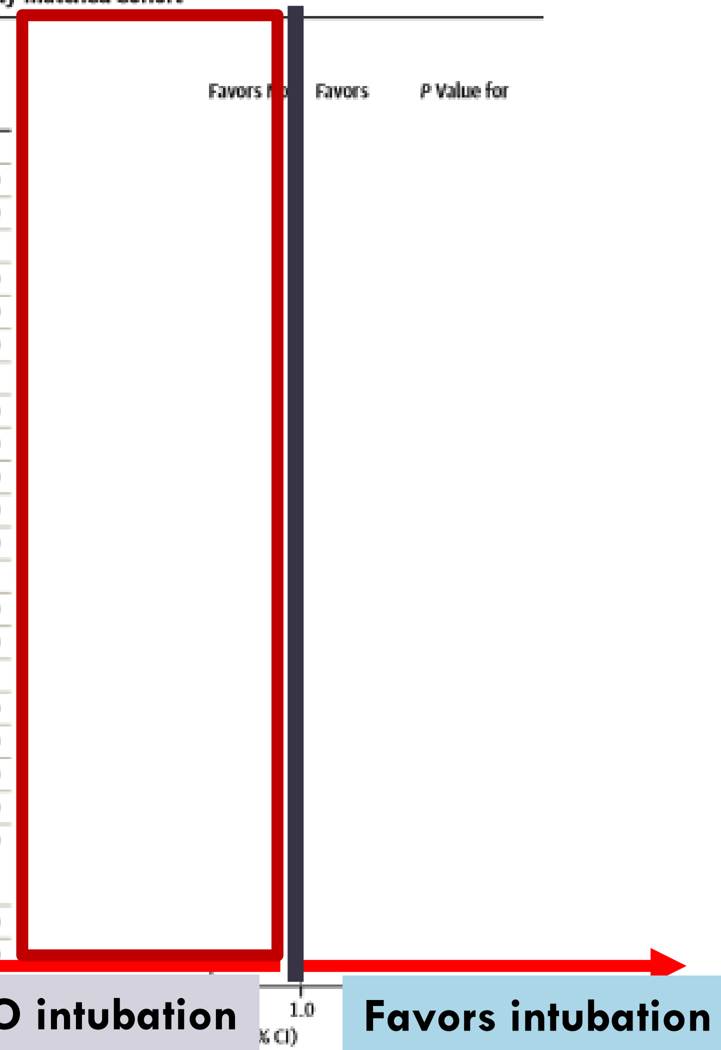
- No way to blind the assignment
- CPR quality/ventilations not measured
- No additional training for airway placement
  - Evaluated under existing protocols
- Results may not apply in the hospital setting, but…

Wang, H. et al. (2018) JAMA 320(8)

Should we put an emphasis on intubation in the first 15 minutes?

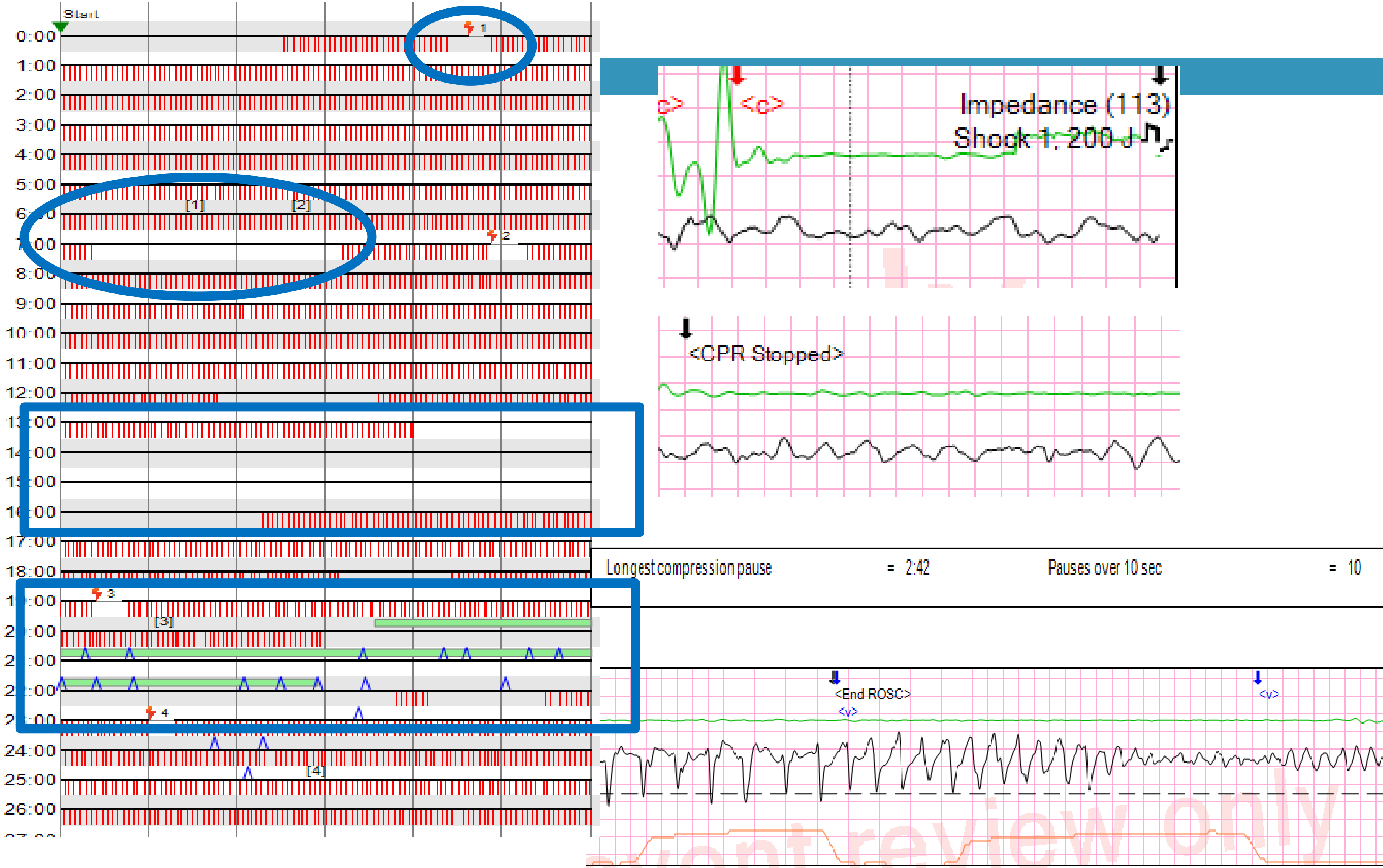
Figure 2. Forest Plot of Subgroup Analyses of Survival to Hospital Discharge in the Propensity-Matched Cohort

Subgroup	Survival to Hospital Discharge, No. of Patients With Outcome/Total Patients (%): Intubation	No Intubation	Risk Ratio (95% CI)
Initial rhythm			
Shockable	1786/6675 (26.8)	2608/6646 (39.2)	0.68 (0.65-0.72)
Nonshockable	5266/36639 (14.4)	5799/36668 (15.8)	0.91 (0.88-0.94)
Time of matching, min[a]			
0-4	4321/25219 (17.1)	5098/25219 (20.2)	0.85 (0.82-0.88)
5-9	2248/14937 (15.0)	2693/14937 (18.0)	0.84 (0.79-0.88)
10-15	483/3158 (15.3)	616/3158 (19.5)	0.78 (0.70-0.87)
Illness category			
Medical cardiac	2697/15716 (17.2)	3710/15779 (23.5)	0.73 (0.70-0.77)
Medical noncardiac	2695/20017 (13.5)	2834/19979 (14.2)	0.95 (0.91-1.00)
Surgical cardiac	632/2197 (28.8)	747/2274 (32.8)	0.88 (0.80-0.96)
Surgical noncardiac	910/4708 (19.3)	984/4623 (21.3)	0.91 (0.84-0.98)
Trauma	118/676 (17.5)	132/659 (20.0)	0.87 (0.79-1.09)
Respiratory insufficiency[b]			
Yes	2546/14845 (17.2)	2630/14822 (17.7)	0.97 (0.92-1.02)
No	4506/28469 (15.8)	5777/28492 (20.3)	0.78 (0.75-0.81)
Location			
Emergency department	914/4546 (20.1)	1131/4422 (25.6)	0.79 (0.73-0.85)
Floor with telemetry	1570/9373 (16.8)	1987/9342 (21.3)	0.79 (0.74-0.83)
Floor without telemetry	1432/12331 (11.6)	1684/12263 (13.7)	0.85 (0.79-0.90)
Intensive care unit	2161/13384 (16.1)	2406/13556 (17.7)	0.91 (0.86-0.97)
Operating room, postanesthesia care unit, or interventional unit	758/2550 (29.7)	903/2585 (34.9)	0.85 (0.79-0.92)
Other	217/1130 (19.2)	296/1146 (25.8)	0.74 (0.63-0.88)
Overall	7052/43314 (16.3)	8407/43314 (19.4)	0.84 (0.81-0.87)



Andersen et al (2017) JAMA; 317:5

60 minute case……Minutes 1 - 26



Summary

Compression count = 993

Longest compression pause = 0:33

Pauses over 10 sec = 2

Ventilation

AED-prompted CPR period

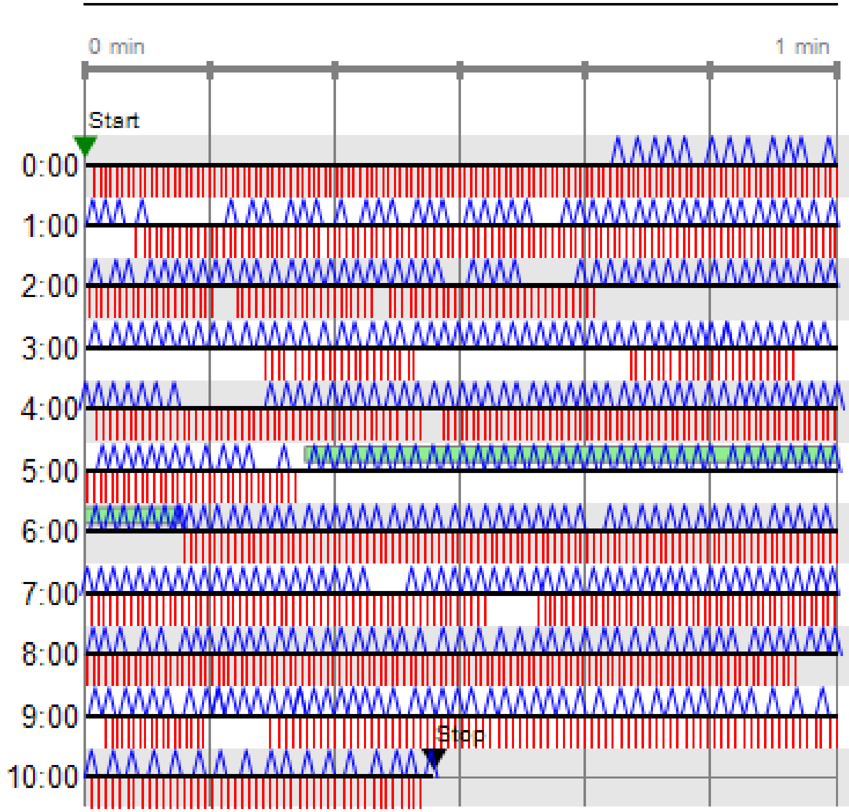
Shock

Chest compression

AED Analysis

ROSC (user annotated)

CPR QUIK-VIEW



Interval Statistics

Compr. ratio, %	Compr. rate	Vent. rate
100	130	12
95	122	41
68	115	45
45	113	--
99	121	49
98	124	--
100	115	51
95	119	55
95	125	47
91	106	49
98	105	--

AVOID excessive ventilation!!!

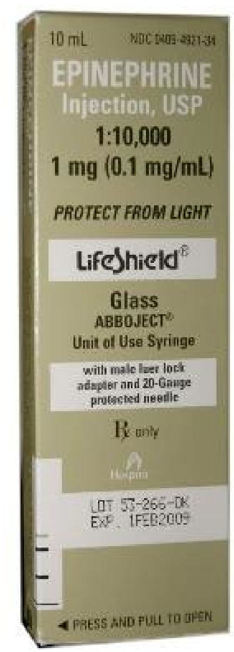
"Hyperventilation Kills"

-ECCU Conference 2015

DOES EPI MAKE YOU PEPPY?!

Is Epinephrine beneficial or does it cause harm?

- Current recommendation: 1 mg Q 3 – 5 min
- RCT Epi vs. Placebo
- Warwick University
- UK & Wales
- Enrollment started Sept 2014
- 8,000 subjects
- Out-of-Hospital Cardiac Arrest



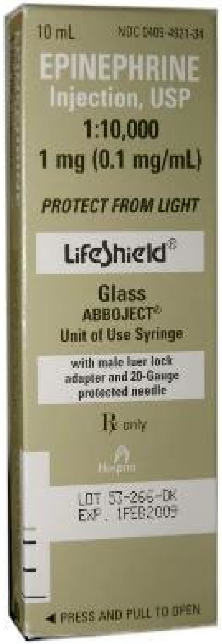
PARAMEDIC2
The Adrenaline Trial

http://www2.warwick.ac.uk/fac/med/research/hscience/ctu/trials/critical/paramedic2/caa/

Why are we questioning Epi?

***Epi associated with worse neurologic outcomes**
Over 500,000 patients!!!!

- Dumas et al (2014) J Amer College of Card*
- Olasveengen et al (2012) Resuscitation*
- Hagihara et al (2012) JAMA*
- Jacobs et al (2011) Resuscitation*
- Olasveengen et al (2009) JAMA*
- Ong et al (2007) Ann Emerg Med*
- Gueugniaud et al (1998) NEJM
- Herlitz et al (1995) Resuscitation*
- Paradis et al (1991) JAMA



Does Epi make you peppy?!

Perkins NEJM (2018)

Table 1. Characteristics of the Patients at Baseline.*

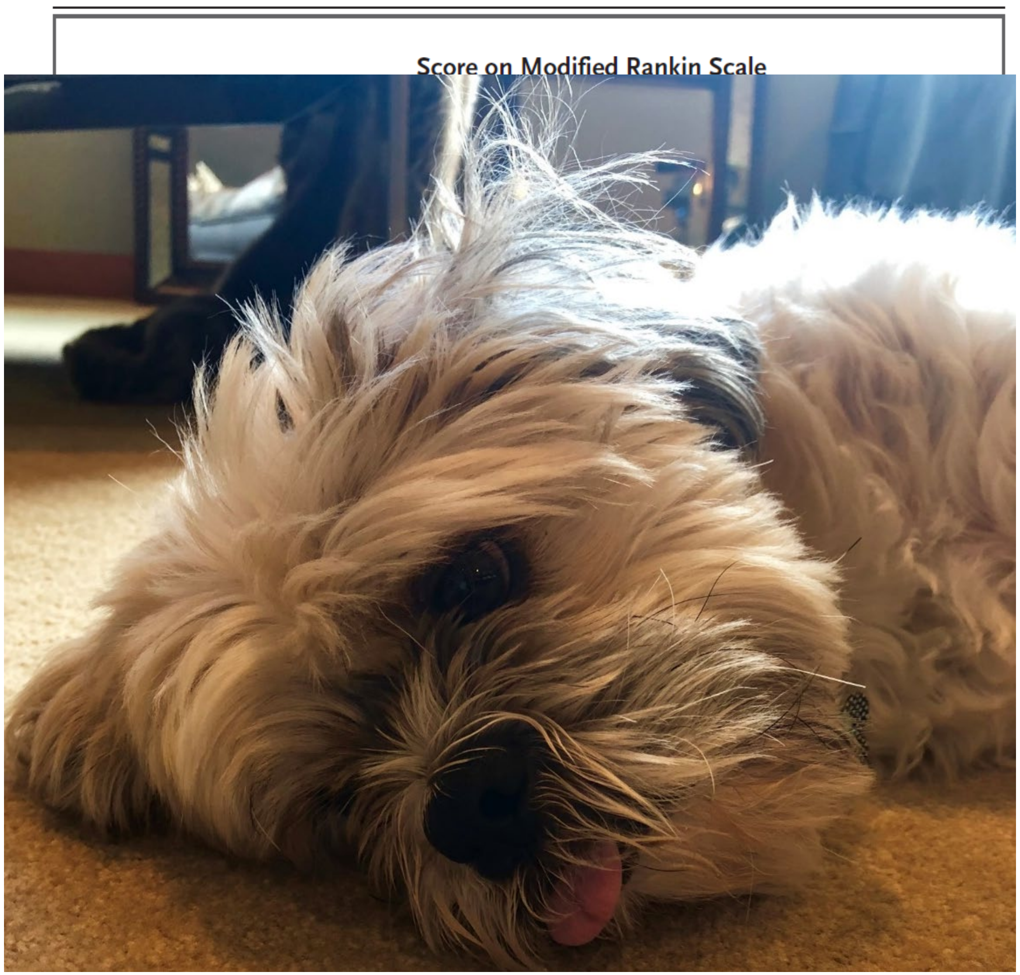
Characteristic	Epinephrine (N=4015)	Placebo (N=3999)
Mean age ±SD — yr	69.7±16.6	69.8±16.4
Sex — no. (%)		
Male	2609 (65.0)	2584 (64.6)
Female	1406 (35.0)	1415 (35.4)
Initial cardiac rhythm — no. (%)		
Shockable	770 (19.2)	748 (18.7)
Ventricular fibrillation	716 (17.8)	684 (17.1)
Pulseless ventricular tachycardia	25 (0.6)	20 (0.5)
Not otherwise identified with AED	29 (0.7)	44 (1.1)
Nonshockable	3149 (78.4)	3181 (79.5)
Asystole	2135 (53.2)	2194 (54.9)
Pulseless electrical activity	955 (23.8)	937 (23.4)
Bradycardia	20 (0.5)	16 (0.4)
Not otherwise identified with AED	39 (1.0)	34 (0.9)

~59% received bystander CPR

30 day Survival: Overall survival 3.2% in Epi group, 2.4% in placebo; p = 0.02 (unadjusted odds ratio for survival, 1.39; 95% confidence interval [CI], 1.06 to 1.82;)

Perkins NEJM (2018)

Survival & Neuro Outcomes



Survival to discharge with favorable neuro outcome:

- Mod Rankin ≤ 3

- 87/4007 (2.2%) Epi group
- 74/3994 (1.9%) placebo group
- *NO statistical difference in the proportion of patients who survived until hospital discharge with a favorable neurologic outcome
- unadjusted odds ratio, 1.18; 95% CI, 0.86 to 1.61).

Severe neurologic outcome:

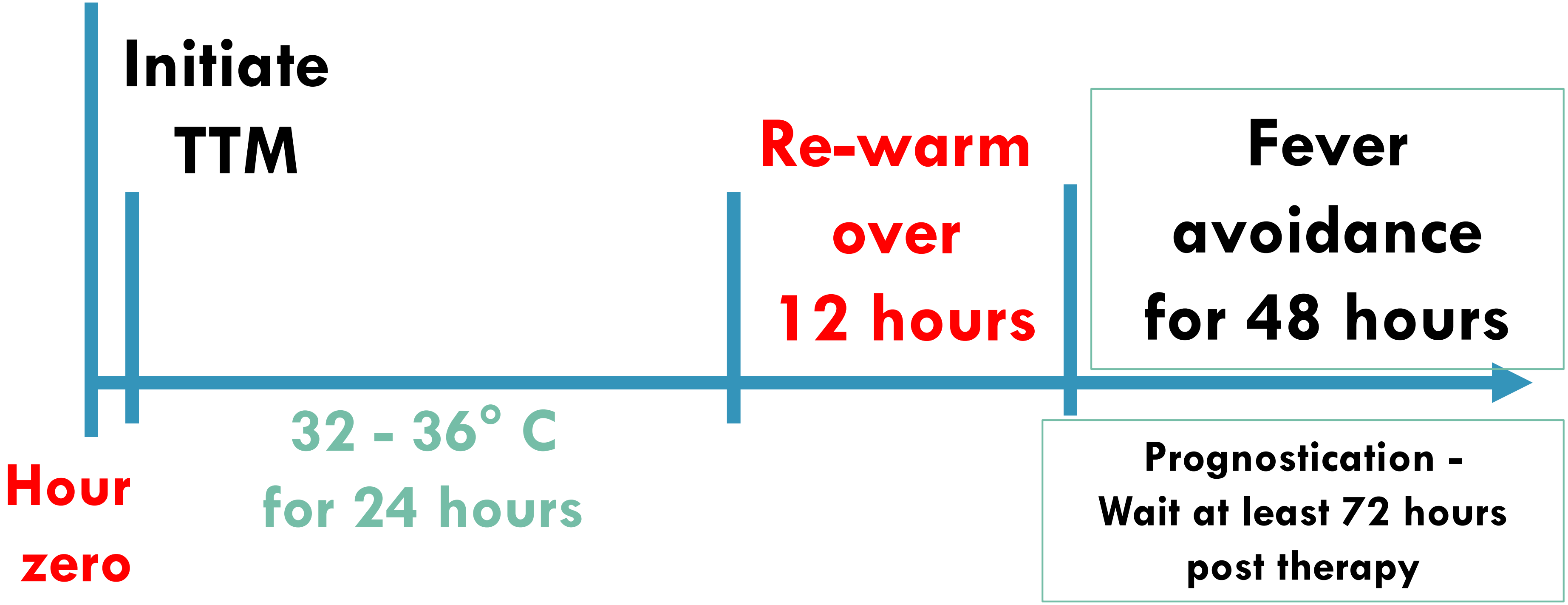
- Mod Rankin 4 or 5

- **39/126 (31%) Epi group**
- 16/90 (17.8%) placebo group

Perkins NEJM (2018)

POST-ARREST CARE

Post cardiac arrest timeline:



Do we need more answers?

Changes in Temperature Management of Cardiac Arrest Patients Following Publication of the Target Temperature Management Trial

Ryan Salter, FANZCA[1]; Michael Bailey, PhD[2–4]; Rinaldo Bellomo, MD[2,3,5]; Glenn Eastwood, PhD[2,5]; Andrew Goodwin, BEng (Env)[6]; Niklas Nielsen, PhD[7,8]; David Pilcher, FCICM[2,9,10]; Alistair Nichol, PhD[2,9,11]; Manoj Saxena, PhD[12–14]; Yahya Shehabi, PhD[4,15]; Paul Young, PhD[1,16]; on behalf of the Australian and New Zealand Intensive Care Society Centre for Outcome and Resource Evaluation (ANZICS-CORE)

Salter et al (2018) Critical Care Medicine

More fever observed?

TABLE 2. Temperature Data and Clinical Outcomes

Characteristics	Pre-TTM Trial Cohort[a], $n = 4{,}450$	Post-TTM Trial Cohort[b], $n = 5{,}184$	Point Estimate (99% CI)	p
Temperature variables				
Lowest temperature in first 24 hr in ICU, °C, mean (SD)	33.77 (1.71)	34.90 (1.39)	0.98 (0.89–1.06)	< 0.001
Highest temperature in first 24 hr in ICU, °C, mean (SD)	36.38 (1.61)	37.03 (1.26)	0.65 (0.57–0.73)	< 0.001
Difference between the highest and lowest temperature in first 24 hr in ICU, °C, mean (SD)	2.69 (1.71)	2.32 (1.46)	−0.38 (−0.46 to −0.29)	< 0.001
Average of highest and lowest temperature in the first 24 hr in ICU, °C, mean (99% CI)	35.1 (35.1–35.2)	35.9 (35.9–35.9)	0.8 (0.7–0.9)	< 0.001
Percentage of patients with a lowest temperature < 34°C in the first 24 hr in ICU, % (99% CI)	57.1 (55.1–59.1)	24.8 (23.2–26.4)	−32.3 (−34.9 to −29.7)	< 0.001
Proportion with fever (highest temperature > 38°C), n (%)	568 (12.8)	853 (16.5)	1.35 (1.16–1.56)	< 0.001
In-hospital mortality, mean (SD)				
Unadjusted	2,331 (52.4)	2,769 (53.4)	1.04 (0.94–1.16)	0.31
Adjusted for ANZ ROD	Not applicable	Not applicable	1.27 (1.13–1.43)	< 0.001
Adjusted for ANZ ROD, temperature removed[c]	Not applicable	Not applicable	1.06 (0.95–1.20)	0.17
Adjusted for ANZ ROD, temperature affected removed[d]	Not applicable	Not applicable	1.06 (0.95–1.19)	0.18
ICU length of stay, d, geometric mean (99% CI)				
Overall	2.94 (2.82–3.07)	2.75 (2.64–2.85)	0.93 (0.88–0.99)	0.002
Survivors	4.27 (4.07–4.47)	3.85 (3.68–4.02)	0.90 (0.85–0.96)	< 0.001
Nonsurvivors	1.91 (1.79–2.04)	1.90 (1.79–2.01)	0.99 (0.91–1.08)	0.80
Hospital length of stay, d, geometric mean (99% CI)				
Overall	5.29 (5.03–5.57)	5.16 (4.93–5.41)	0.98 (0.91–1.05)	0.36
Survivors only	12.20 (11.63–12.80)	11.92 (11.51–12.34)	0.98 (0.91–1.04)	0.36
Nonsurvivors only	2.30 (2.16–2.45)	2.48 (2.35–2.62)	1.08 (0.99–1.17)	0.02

Salter et al (2018) Critical Care Medicine

Adjusted mortality rates increasing?

Salter et al

Inhospital mortality, mean (SD)				
Unadjusted	2,331 (52.4)	2,769 (53.4)	1.04 (0.94–1.16)	0.31
Adjusted for ANZ ROD	Not applicable	Not applicable	1.27 (1.13–1.43)	< 0.001
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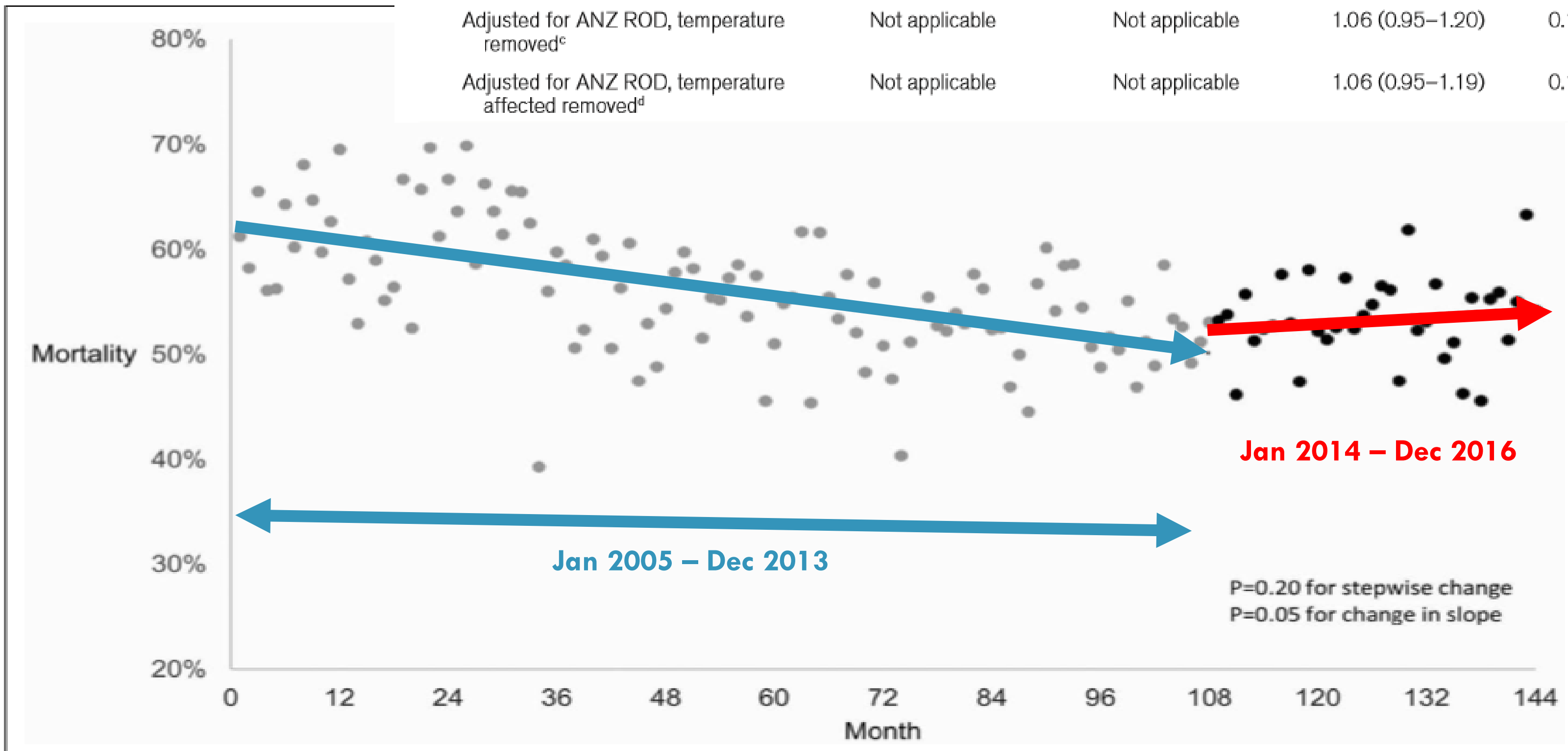

Figure 3. Inhospital mortality by month. The *gray dots* are for the months from January 2005 until December 2013 inclusive; the *black dots* are for the months from January 2014 until December 2016 inclusive. The targeted temperature management study was published online on November 17, 2013, and was published in print on December 5, 2013.

Salter et al (2018) Critical Care Medicine

What's happening now?

TTM-2 Trial

33°C vs. 37.8°C

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ClinicalTrials.gov

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Trial record **1 of 1** for: ttm2 trial

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Targeted Hypothermia Versus Targeted Normothermia After Out-of-hospital Cardiac Arrest (TTM-2)

The safety and scientific validity of this study is the responsibility of the study sponsor and investigators. Listing a study does not mean it has been evaluated by the U.S. Federal Government. Know the risks and potential benefits of clinical studies and talk to your health care provider before participating. Read our disclaimer for details.

ClinicalTrials.gov Identifier: NCT02908308

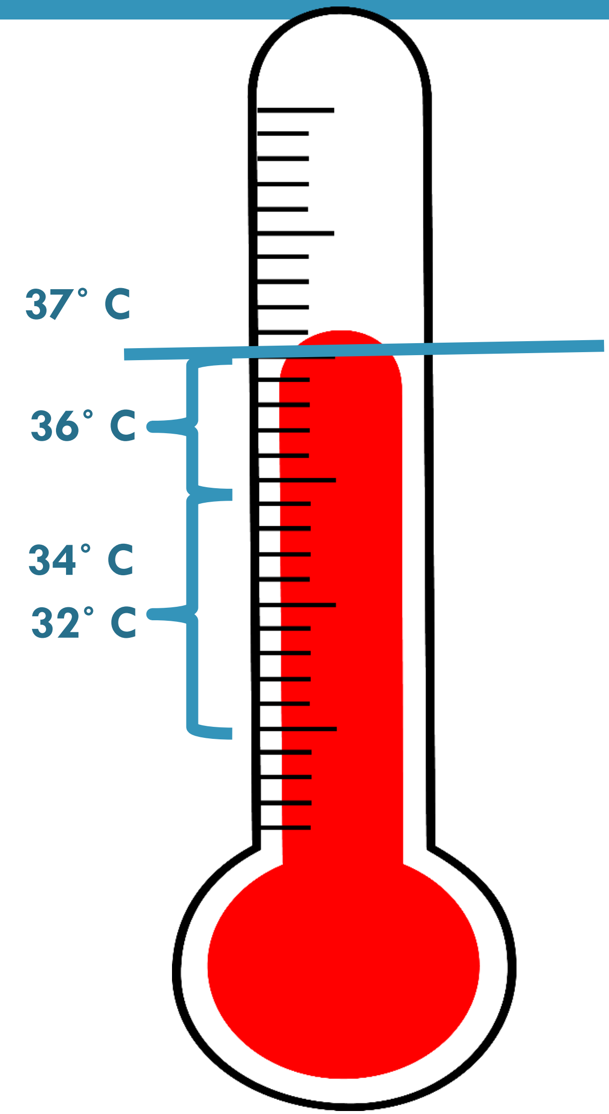
Recruitment Status: Recruiting
First Posted: September 20, 2016
Last Update Posted: November 21, 2017

See **Contacts and Locations**

1900 patients – estimated completion December 2021

Clinical assessment:

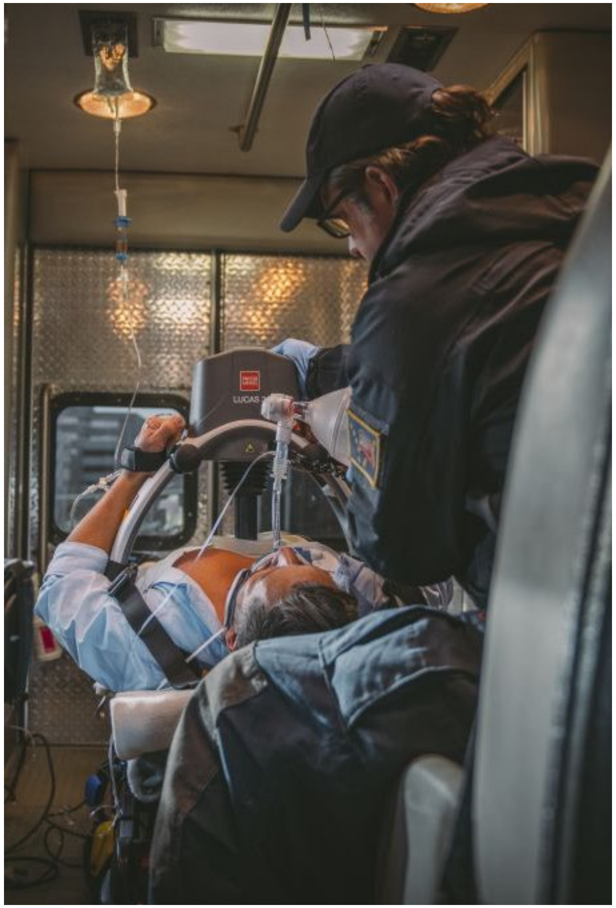
- Does mild hypothermia (32 - 34°C) reduce mortality & improve neurologic outcomes post cardiac arrest?
- **YES!!!!**
- Does 36° C have the same benefit?
- **YES, but…**
- Does "normothermia" have the same benefit?
- **We don't know!!!**
- Is fever bad post-cardiac arrest?
- **Very Likely!!!!**



ONGOING TRIALS

When is CPR challenging?

- Prolonged codes
- Cardiac Cath Lab
- In a hospital bed
- When you don't have enough staff/limited resources
- On a morbidly obese patient
- Back of a moving ambulance



Should we rethink the way we provide chest compressions?

Mechanical CPR Devices

Ongoing Trials?

STUDY PROTOCOL **Open Access**

CrossMark

Mechanical versus manual chest compressions in the treatment of in-hospital cardiac arrest patients in a non-shockable rhythm: a randomised controlled feasibility trial (COMPRESS-RCT)

Keith Couper[1,2*], Tom Quinn[3], Ranjit Lall[1], Anne Devrell[4], Barry Orriss[4], Kate Seers[5], Joyce Yeung[1,2], Gavin D. Perkins[1,2] On behalf of the COMPRESS-RCT collaborators

- Multi-center parallel group feasibility randomized controlled trial
- Compare mechanical chest compressions vs. manual chest compressions on 30-day survival following **in-hospital** cardiac arrest

Couper et al (2018) Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine;26:70

LUCAS vs. Manual CC

- 330 adult patients who sustain an in-hospital cardiac arrest in a non-shockable rhythm
- Over approximately 2 years
- Randomized in a 3:1 ratio to receive ongoing treatment with a mechanical chest compression device (LUCAS 2/3) or continued manual chest compressions
- 24/7 recruitment by the clinical cardiac arrest team
- Deferred consent, with consent for follow-up sought from patients or their LNOK in those that survive
- Embedded qualitative study, conduct semi-structured interviews with hospital staff to explore facilitators and barriers to study recruitment

Couper et al (2018) Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine;26:70

Bottom line…

- Team dynamics matter!
- Mock codes can assist in assessing system response
- Maybe we don't need to place advanced airways intra-arrest?
  - If you do, stay on the chest!
- We still don't know if Epi makes us peppy or leads to worse neurologic outcomes!
- If your TTM target is 36° C, evaluate your data!

Stay in Touch!

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