

**ACEP EAGLES 2014**  
**The Top Five EMS Articles of 2014**

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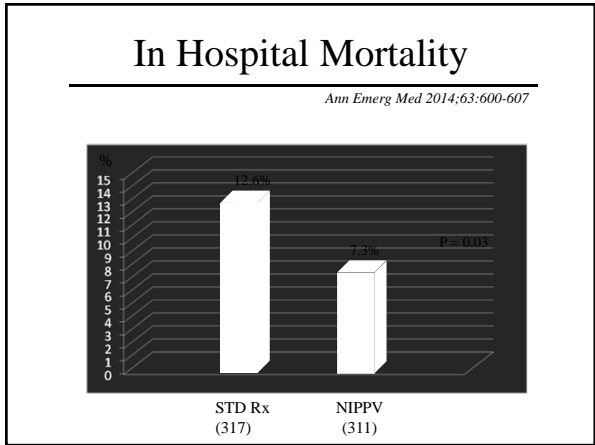
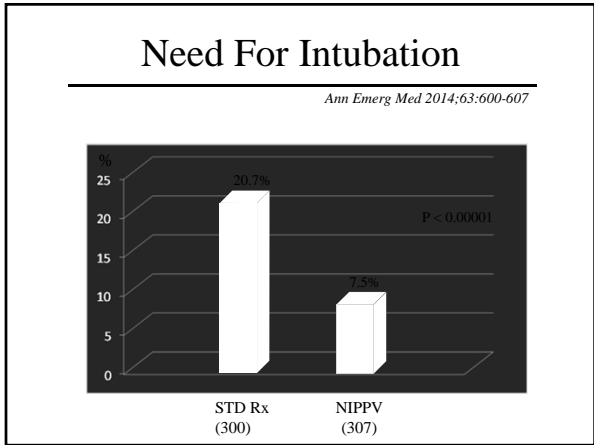
Corey M. Slovis, M.D.  
 Vanderbilt University Medical Center  
 Metro Nashville Fire Department  
 Nashville International Airport  
 Nashville, TN

EMERGENCY MEDICAL SERVICES/ORIGINAL RESEARCH  
**Effect of Out-of-Hospital Noninvasive Positive-Pressure Support Ventilation in Adult Patients With Severe Respiratory Distress: A Systematic Review and Meta-analysis**  
 Sameer Mal, MD, FRCP<sup>1</sup>; Shelley McLeod, MSc; Alla Iatsavichene, BSc, MLIS; Adam Dukelow, MD, FRCP<sup>2</sup>; Michael Lewell, MD, FRCP<sup>3</sup>  
<sup>1</sup>Corresponding author. E-mail: jms@vumc.org

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**Does NIPPV really make a measurable difference in need for ETT +/-or mortality?**

- Metanalysis: 7 studies, 632 patients
- Need for ETI and mortality measured
- 6 CPAP, 1 BiPAP



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**Results**

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- NIPPV decreased need for ETT by a RR of 0.37 compared to standard Rx (NNT = 8)
- NIPPV decreased mortality by a RR of 0.58 (NNT = 18)

**Non-Invasive Ventilator Take Homes**

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- It works
- Use it!
- CPAP or BiPaP
- COPD, Pulmonary Edema, Pneumonia
- For any cause of respiratory failure

Resuscitation 2013;84:1691-96

Contents lists available at ScienceDirect  
**Resuscitation**  
 journal homepage: www.elsevier.com/locate/resuscitation

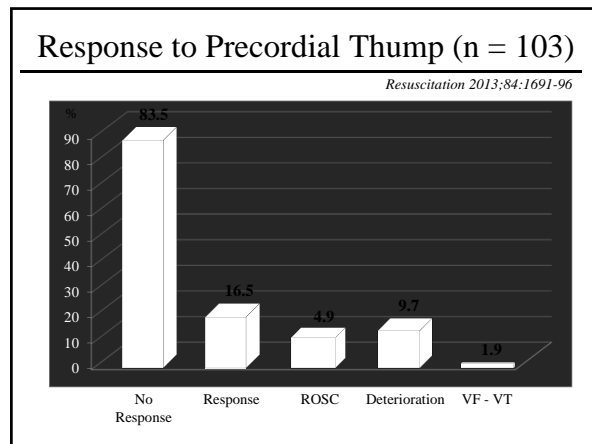
Clinical paper  
 Treatment of monitored out-of-hospital ventricular fibrillation and pulseless ventricular tachycardia utilising the precordial thump<sup>†</sup>  
 Ziad Nehme<sup>a,b,c</sup>, Emily Andrew<sup>a,b</sup>, Stephen A. Bernard<sup>d,e</sup>, Karen Smith<sup>a,b,c</sup>

<sup>a</sup> Monash Medical Centre, Victoria, Australia  
<sup>b</sup> University of Melbourne, Victoria, Australia  
<sup>c</sup> University of Western Australia, Crawley, Western Australia, Australia  
<sup>d</sup> Monash Medical Centre, Victoria, Australia

*Resuscitation 2013;84:1691-96*

**How effective is a precordial thump in patients with VF or VT?**

- 434 EMS patients with monitored VF or VT
- 75% shocked vs 25% initially thumped
- 16.5% (17 patients) responded to thump
- 57.8% of defibrillated immediate ROSC



## Precordial Thump Take Homes

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- Rarely works (1/8)
- 2x deteriorate vs improve
- ROSC rare
- *Dramatic, for TV, real life, not so much*

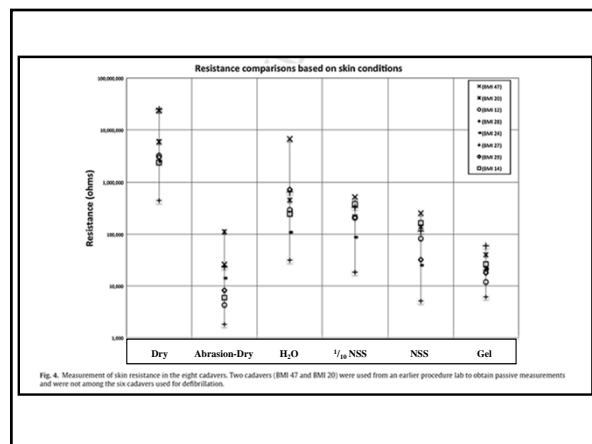
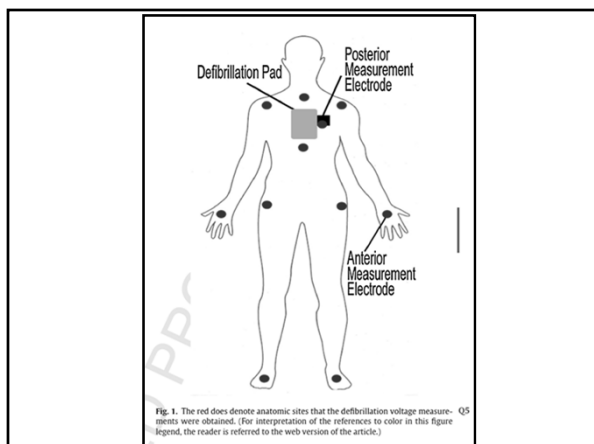
Resuscitation 2014;10:1330-6

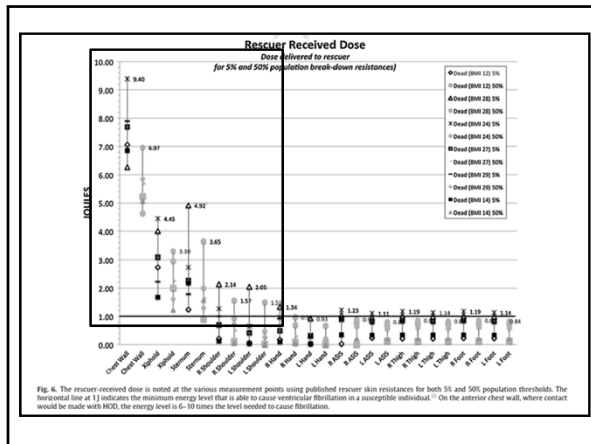
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Clinical Paper  
 Electrical exposure risk associated with hands-on defibrillation<sup>†</sup>  
 Daniel L. Lemkin<sup>a,\*</sup>, Michael D. Witting<sup>a</sup>, Michael Allison<sup>b</sup>, Ali Farzad<sup>a</sup>, Michael C. Bond<sup>a</sup>, Mark A. Lemkin<sup>c</sup>

<sup>a</sup> Department of Emergency Medicine, University of Maryland School of Medicine, Baltimore, MD, United States  
<sup>b</sup> Department of Emergency Medicine, University of Maryland Medical Center, Baltimore, MD, United States  
<sup>c</sup> Laser Technology, Hayward, CA, United States

- Is hands-on defibrillation safe?
- Cadaver study; 6 cadavers used
- Used A-P defibrillator pad placement
- Defibrillated cadavers at 360 joules





## Conclusions

*Resuscitation 2014; epub ahead of print*

Based on this study, hands-on defibrillation is dangerous and should not be done

Or

Based on this study, cadavers should not defibrillate themselves

## Study Issues

- Used cadavers without blood and perfused organs
- Measured current on cadaver body surface
- Did not directly measure current going to rescuer directly



*Resuscitation 2014; epub ahead of print*

This is the first hands-on defibrillation study not to use hands-on defibrillation

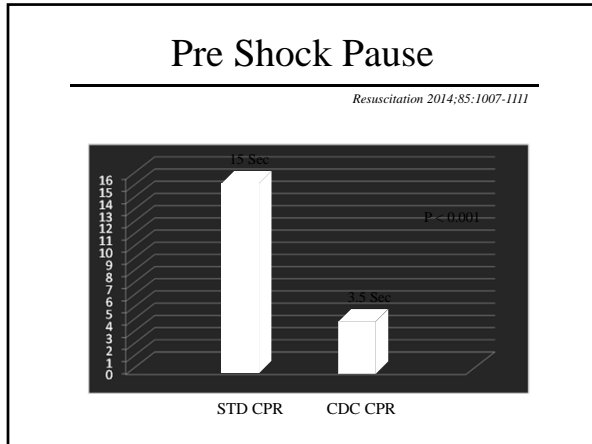
## Take Homes on Hands-On Defibrillation (HOD)

- The safety of hand-on defibrillation (HOD) is not fully known
- Use gloves if you do HOD
- Do not put your hands on the pad(s)
- HOD or not, minimize pre-shock pause
- Large “real life” study needed



*Resuscitation 2014;85:1007-1111*

- Does compressing during defibrillator charging (CDC) improve compression fraction and/or survival
- 129 patients, Canadian study
- 54.2% received compressions during charging
- No significant change in rate or depth noted



- ### Conclusions on CDC
- Easy to teach and do
  - Increases compression fraction by 10%
  - Not yet clear if improves survival
  - Larger study will evaluate mortality effects
  - AEDs will all soon have this feature

ORIGINAL ARTICLE

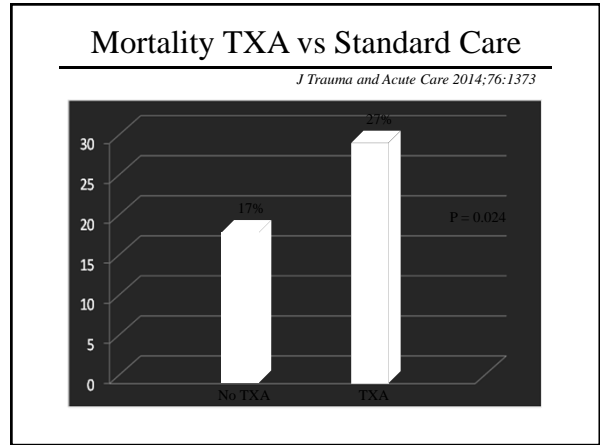
#### Do all trauma patients benefit from tranexamic acid?

Evan J. Vohs, MD, Casey J. Allen, MD, Robert M. Van Haren, MD, MSPH, Justin M. Jorila, MD, Hua Li, MD, PhD, Alan S. Livingston, MD, Nicholas Namias, MD, MBA, Carl I. Schmidt, MD, PhD, and Kenneth G. Proctor, PhD, Miami, Florida

BACKGROUND: This study tested the hypothesis that early intravenous use of tranexamic acid (TXA) reduces mortality in a subset of the most critically injured trauma intensive care unit patients.  
CONCLUSIONS: Among patients in 1217 who required emergency surgery (ES) and/or transfusion from August 2009 to January 2013, 503 were randomized. All subjects received a median of 1.77 grams of TXA over 8 hours (1 gram IV then 1 gram over 8 hours). 178 patients died, and 184 patients were discharged. With the use of propensity score-based analysis, the

*J Trauma and Acute Care 2014;76:1373*

- 1217 Level 1 trauma patients
- All required immediate OR or blood
- TXA 1 gram IV then 1 G over 8 hours
- 54% penetrating trauma, 25% TBI
- Evaluated mortality in 150 TXA matched pts



Use new drugs as soon as possible  
Before they develop side effects  
or loose efficacy

- ### TXA Summary 2014 - 2015
- Role in US Level I Centers Doubtful
  - Seems to work if transport to definitive care will be delayed significantly
  - Studies over next 12-18 months will be more definitive

**ORIGINAL CONTRIBUTIONS**

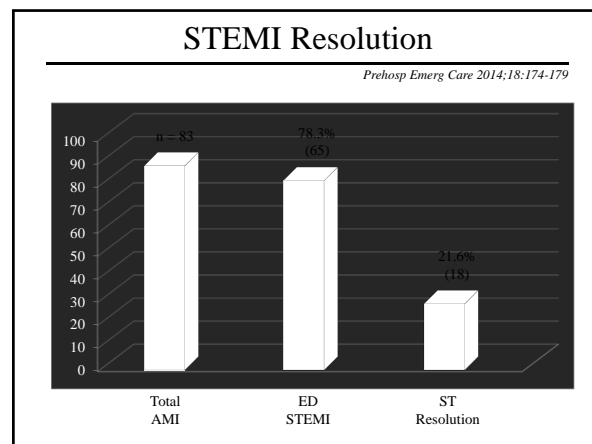
PREVALENCE AND INTERVENTIONAL OUTCOMES OF PATIENTS WITH RESOLUTION OF ST-SEGMENT ELEVATION BETWEEN PREHOSPITAL AND IN-HOSPITAL ECG

Micah Ownbey, MD, Brian Suffoletto, MD, MS, Adam Frisch, MD, Francis X. Guyette, MD, MS, Christian Martin-Gill, MD, MPH

*Prehosp Emerg Care 2014;18:174-179*

How often does a prehospital STEMI arrive with a resolved ECG?

- 83 prehospital ECGs with STEMI
- 217 EMS agencies; VPMC Medical Control
- All patients went to cath lab



PREVALENCE AND INTERVENTIONAL OUTCOMES OF PATIENTS WITH RESOLUTION OF ST-SEGMENT ELEVATION BETWEEN PREHOSPITAL AND IN-HOSPITAL ECG

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*Prehosp Emerg Care 2014;18:174-179*

- 1 in 5 prehospital STEMI have ECG changes that resolve prior to ED arrival
- There was no difference in % occlusion in those with and without ST resolution of STEMI ECG changes
- Patients without STEMI resolution are more likely to have multivessel disease

ST segment resolution of a STEMI still equals a STEMI and mandates rapid transport to coronary catheterization

ST Segment Resolution ≠ NO STEMI

Survival rates in out-of-hospital cardiac arrest patients transported without prehospital return of spontaneous circulation: An observational cohort study

Ian R. Diamond<sup>1,2,3,4</sup>, Steve Lee<sup>1,2</sup>, Daniel E. Sotgiu<sup>1,2</sup>, Lance J. Morrison<sup>1,2,3</sup>

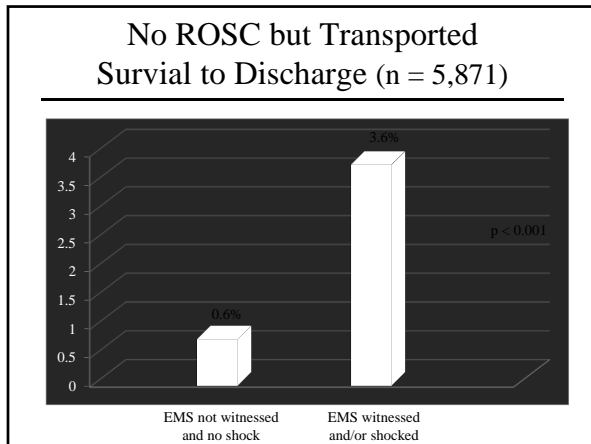
*Resuscitation 2014;85:1488-93*

Should OOH cardiac arrest patients with no ROSC be transported?

- 20,074 OHCA arrest patients
- 45.3% (9,143) met TOR, no transport
- 16.4% (3,374) met TOR guidelines for transport, but had no ROSC
- Evaluated survival and discharge
- Observational study

### Stopping OOH CPR TOR Guidelines

- Arrest not witnessed by EMS
- Non-shockable rhythm
- No ROSC prior to transport



- ### No ROSC EMS Transports
- All no-TOR should be worked or transported
  - All VF patients should be converted or transported
  - There is **not** a 0% survival rate if no ROSC and TOR advises termination

- ### No ROSC and Transporting Take Homes
- Either continue code for finite period or transport if TOR guidelines not met
  - No ROSC  $\neq$  No Transport if TOR guidelines advise continue CPR
  - Have objective criteria on TOR

**Circulation**

Duration of Resuscitation Efforts and Functional Outcome After Out-of-Hospital Cardiac Arrest: When Should We Change to Novel Therapies?  
Joshua C. Reynolds, Adam Frisch, Jon C. Rittenberger and Clifton W. Callaway

Circulation. 2013;128:2488-2494; originally published online November 17, 2013;  
doi: 10.1161/CIRCULATIONAHA.113.002408  
Circulation is published by the American Heart Association, 727 Greenville Avenue, Dallas, TX 75221  
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Print ISSN: 0009-7322, Online ISSN: 1524-4539

Circulation 2013;128:2488-94

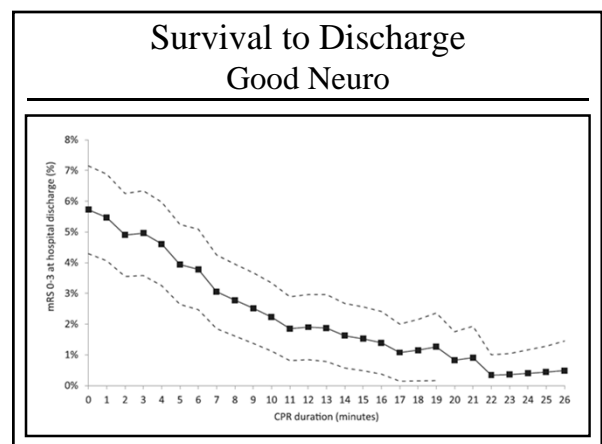
- When should OOH CPR be considered futile?
- How long is “long enough” if no ROSC?
- When should non-ACLS protocols be considered?

**Circulation**

Duration of Resuscitation Efforts and Functional Outcome After Out-of-Hospital Cardiac Arrest: When Should We Change to Novel Therapies?  
Joshua C. Reynolds, Adam Frisch, Jon C. Rittenberger and Clifton W. Callaway

Circulation 2013;128:2488-94

- Retrospective, observational study
- 1,014 adult OOH arrests
- 2005 – 2011, Pittsburgh ROC
- 11% survival to discharge
- 6% good neuro survival



### Survival to Discharge Good Neuro

*Circulation 2013;128:2488-94*

Within 9.3 minutes 74.1% of patients with good neuro outcomes at discharge had ROSC

90% of good neuro outcomes had ROSC by 16 minutes

Only 2% of all attempted resuscitations had ROSC and good neuro after 15 minutes of CPR

### Take Homes

- ROSC and a good functional status are rare after 15 minutes of CPR (< 2%)
- There are, however, survivors after prolonged CPR of more than 20 minutes before ROSC obtained
- Non ACLS therapies should be considered after 10 – 15 minutes per the authors
- Note: compression fractions were 48 – 66%

### Summary

NIPPV decreases mortality

No Thumps

Hands on - maybe

TXA may not work in EMS

Be careful stopping CPR