

Eagles 2019
Key Articles in EMS
February/March 2019

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

Circulation

RESEARCH LETTER

Sudden Cardiovascular Arrest During Sexual Intercourse

Considerable apprehension often surrounds the issue of sudden cardiovascular arrest (SCA) during physical activity, especially that related to sexual intercourse. Sex-related SCA (SxSCA) has been mainly investigated through forensic studies, and epidemiological data are scarce.¹ A comparison of the characteristics and outcomes of SxSCA with other SCAs may allow a better understand-

Ardalan Sharifzadehgan,
MD, MPH
Eloi Marijon, MD, PhD
Wulfran Bougouin, MD,
PhD

Circulation 2018;137:1638-40

**Only 47% received CPR in
these witnessed arrests**

Maybe put on defib pads and hook up AED
during the warm up

GENERAL MEDICINE/ORIGINAL RESEARCH

Aromatherapy Versus Oral Ondansetron
for Antiemetic Therapy Among Adult
Emergency Department Patients: A Randomized
Controlled Trial

Michael D. April, MD, DPhil*; Joshua J. Oliver, MD; William T. Davis, MD; David Ong, MD; Erica M. Simon, DO, MHA;
Patrick C. Ng, MD; Curtis J. Hunter, MD

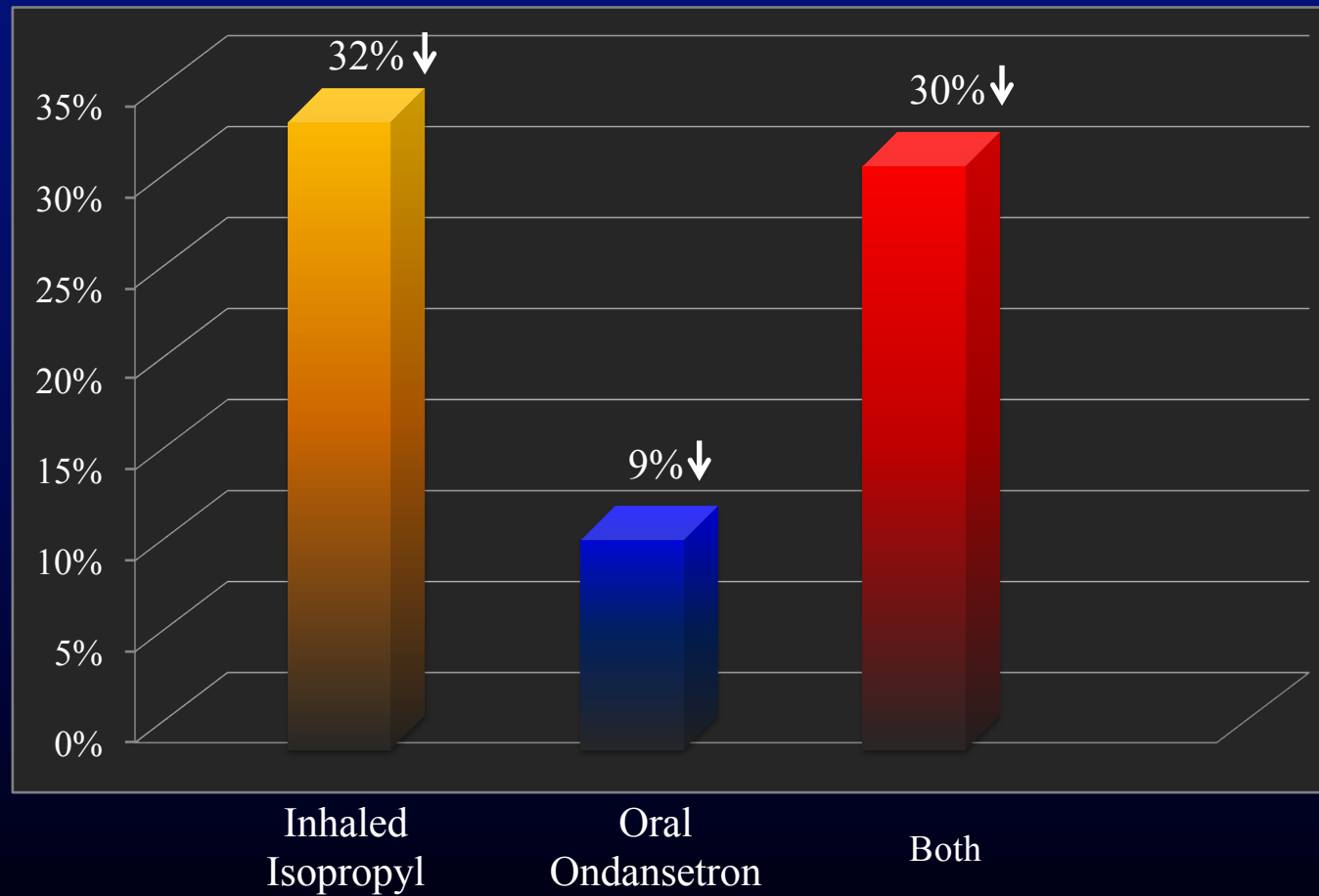
Ann Emerg Med May 2018; ePub ahead of print

How effective is inhaled isopropyl alcohol
vs oral ondansetron for nausea?

- 120 subjects
- 41 isopropyl vs 41 oral ondansetron vs 40 both
- Placebo controlled with inhaled or oral placebo
- Used visual analog nausea scale
- Also evaluated rescue antiemetic therapy

Mean Nausea Decrease

Annal Emerg Med May 2018; ePub ahead of print



Inhaled Isopropyl for Nausea Take Homes

- Inhaled alcohol pad isopropyl alcohol works better than oral ondansetron
- Use it first line, before IV even started

Airway Stuff

Effectiveness of Apneic Oxygenation During Intubation: A Systematic Review and Meta-Analysis

Lucas Oliveira J. e Silva; Daniel Cabrera, MD; Patricia Barrionuevo, MD; Rebecca L. Johnson, MD; Patricia J. Erwin, MLS; M. Hassan Murad, MD, MPH; M. Fernanda Bellolio, MD, MS*

*Corresponding Author. E-mail: bellolio.fernanda@mayo.edu, Twitter: [@mfbellolio](https://twitter.com/mfbellolio), [@lucasoesilva12](https://twitter.com/lucasoesilva12).

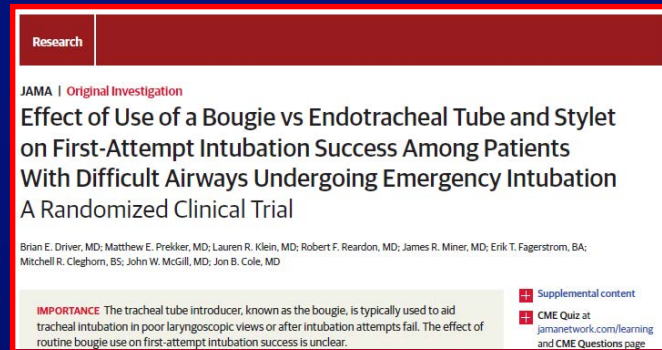
Annals Emerg Med 2017; 70:483-494

- Meta-analysis: 8 studies; 1837 pts

Apneic oxygenation decreases hypoxemia by 1/3 and significantly increases first pass success in ETI

Take Homes

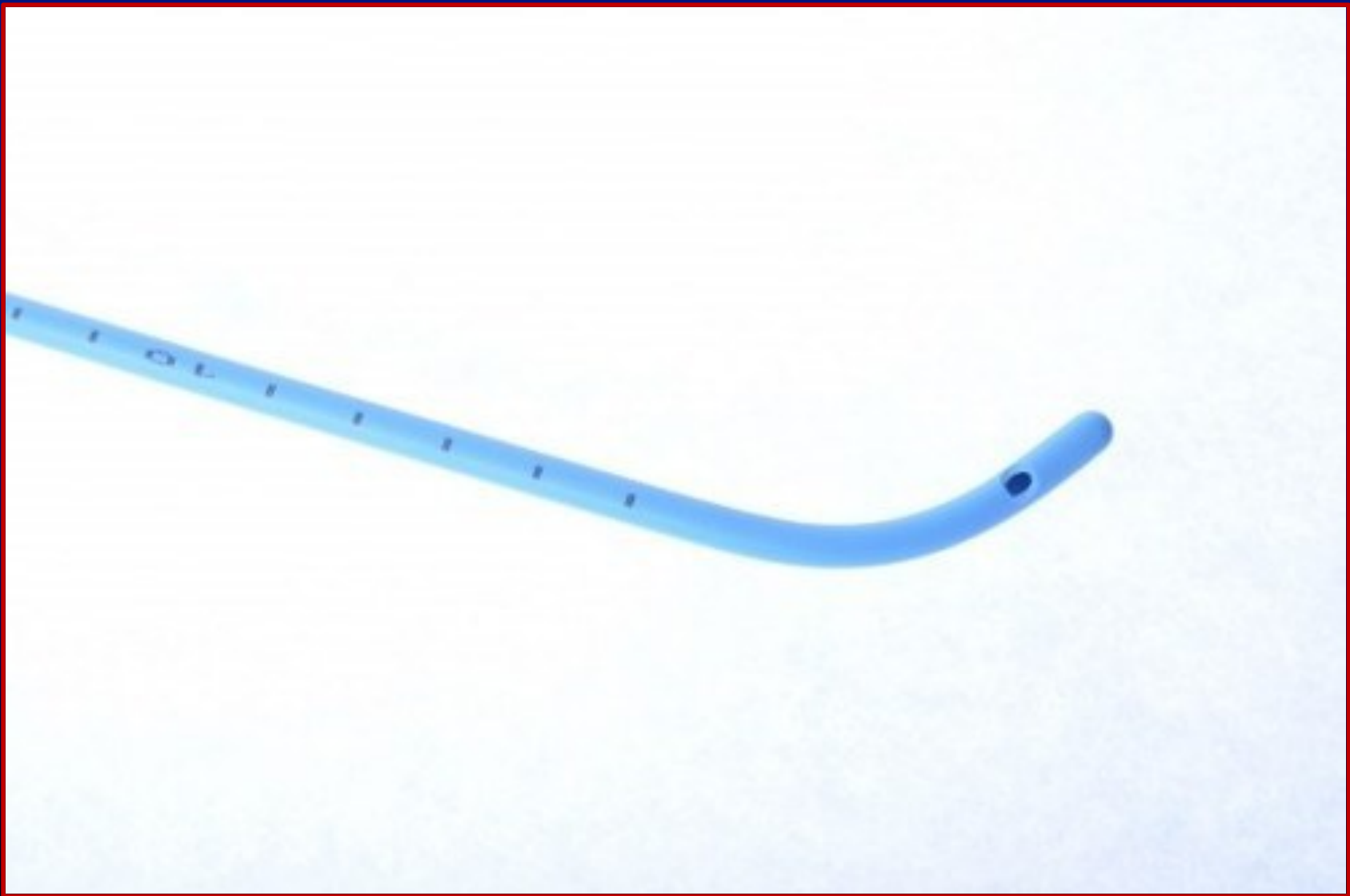
Be sure to provide 100% O₂
by nasal prongs during ETI
whether you use BVM or not



JAMA May 2018;319:2171-84

Does routine Bougie use improve likelihood of first pass endotracheal intubation success?

- 757 patients randomized, Hennepin Med Center
- Bougie first vs ETT with Stylet
- Done with Mac blades and Storz C-MAC
- 58% DL; 21% all video; 20% video passage
- ½ (380) of pts had difficult airway characteristics



JAMA | Original Investigation

Effect of Use of a Bougie vs Endotracheal Tube and Stylet
on First-Attempt Intubation Success Among Patients
With Difficult Airways Undergoing Emergency Intubation
A Randomized Clinical Trial

Brian L. Driver, MD; Matthew E. Prekker, MD; Lauren R. Klein, MD; Robert F. Reardon, MD; James R. Miner, MD; Erik T. Fagerstrom, BA;
Mitchell R. Clegghorn, BS; John W. McGill, MD; Jon B. Cole, MD

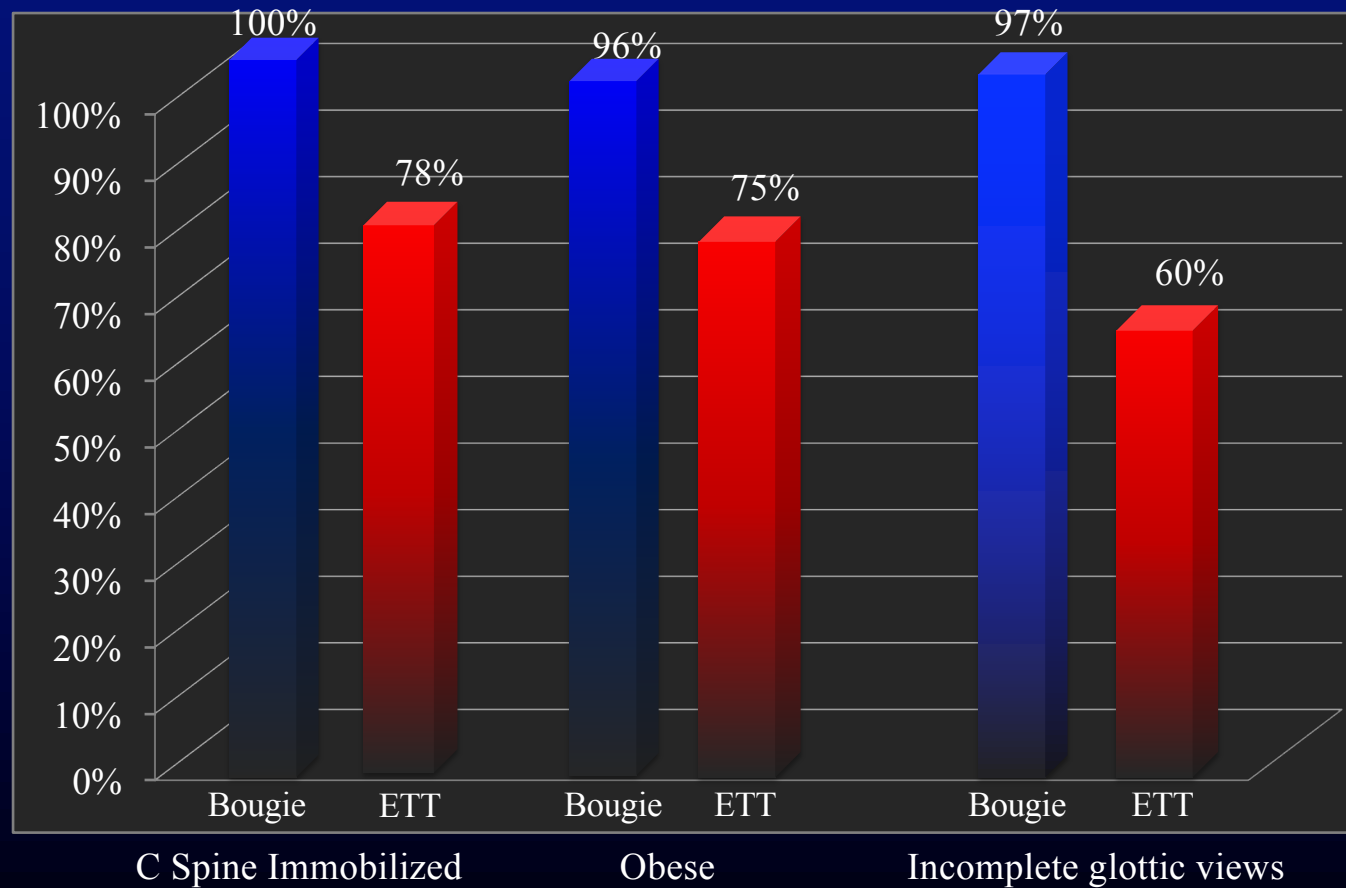
JAMA May 2018;319:2171-84

Bougie vs ETI with Stylet Comparison Groups

- Difficult vs All vs WNL airways
- Difficult = 1 or more:
 - Body fluids obscuring view
 - Airway obstruction or edema
 - Obesity, short neck
 - Small mandible, large tongue
 - Cervical spine immobilization

Most Difficult Airways

JAMA May 2018;319:2171-84



Bougie Use for ETI

Take Homes

- Use bougies more
- They are central to airway management
- Start with a bougie on difficult airways
or go to one quickly after first look

Effect of Cricoid Pressure Compared With a Sham Procedure in the Rapid Sequence Induction of Anesthesia The IRIS Randomized Clinical Trial

Aurélie Birenbaum, MD; David Hajage, MD, PhD; Sabine Roche, MD; Alexandre Ntomba, MD; Mathilde Eurin, MD;
Philippe Cuvillon, MD, PhD; Aurélien Rohn, MD; Vincent Compere, MD, PhD; Dan Benhamou, MD;
Matthieu Biais, MD, PhD; Remi Menut, MD; Sabiha Benachi, MD; François Lenfant, MD, PhD; Bruno Riou, MD, PhD;
for the IRIS Investigators Group

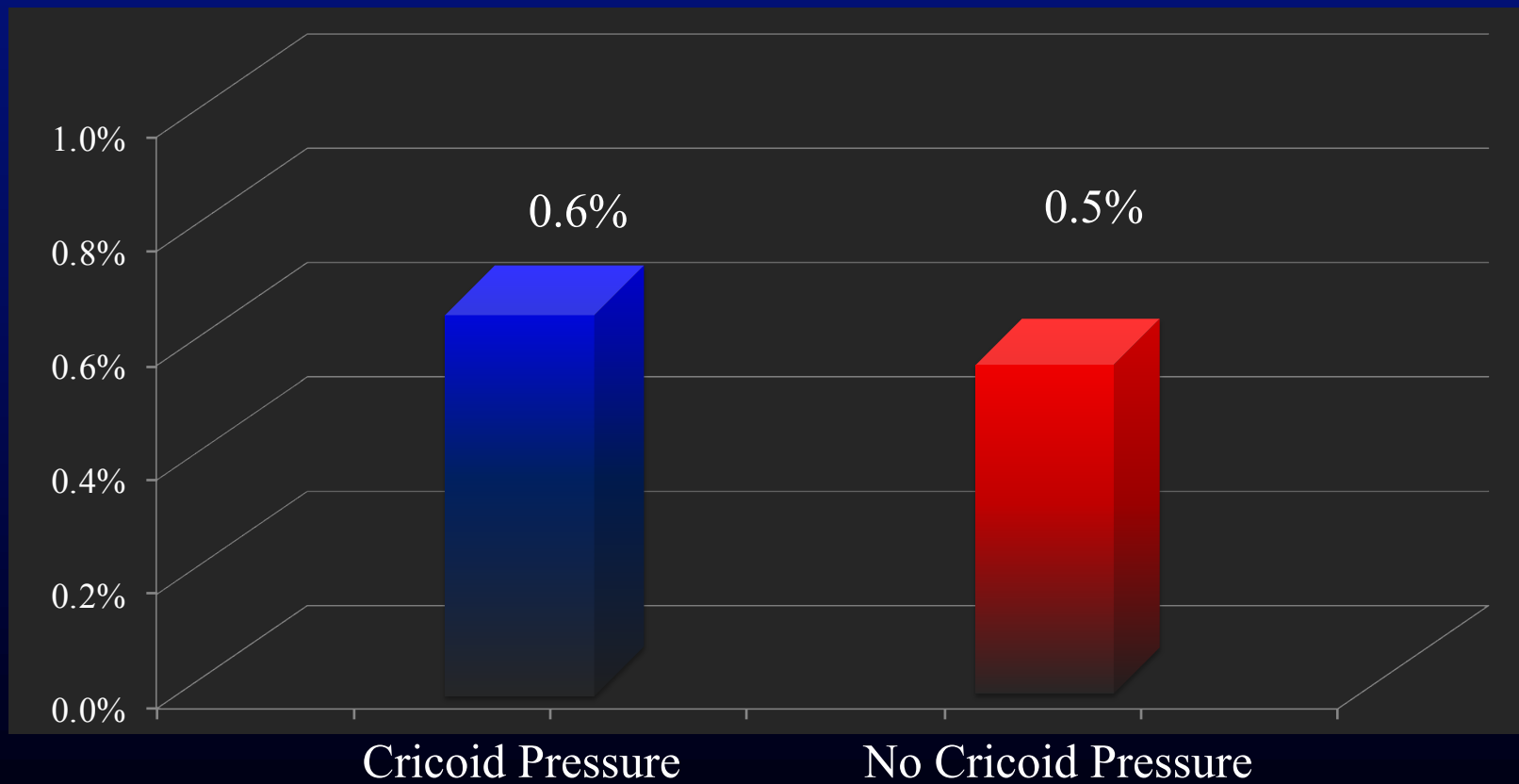
JAMA Surg 2019;154(1):9-17

How valuable is cricoid pressure?

- Randomized double blind study, 3472 pts
- Pulmonary aspiration measured
- Used laryngoscopy or trached aspiration
- Also evaluated effect on ETI

Aspiration and Airway Difficulty Cricoid Pressure

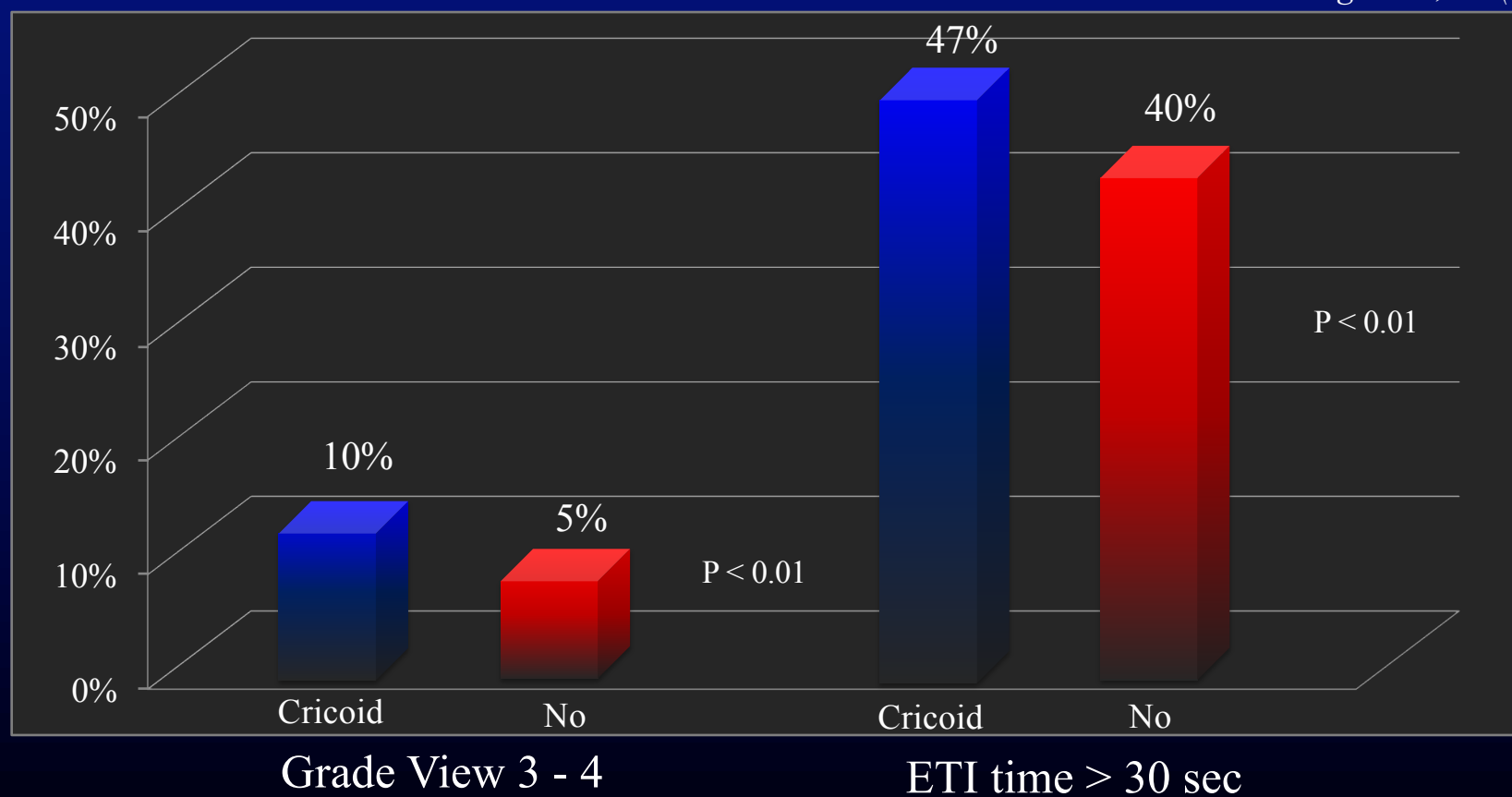
JAMA Surg 2019;154(1):9-17



Airway Difficulty

Cricoid Pressure vs Control

JAMA Surg 2019;154(1):9-17



How Helpful is Cricoid Pressure Using the Sellick Maneuver Take Homes

- It won't help decrease aspiration
- But it will make your intubation harder

NTG in r/o AMI

Safety and Effectiveness of Field Nitroglycerin in Patients with Suspected ST Elevation Myocardial Infarction

Nichole Bosson , MD, MPH, Benjamin Isakson, MD, Jayson A. Morgan, MD, Amy H. Kaji, MD, PhD, Atilla Uner, MD, MPH, Katherine Hurley, MSN, ...show all

Accepted author version posted online: 17 Dec 2018, Published online: 28 Jan 2019

PreHospital Emerg Care 2019 online

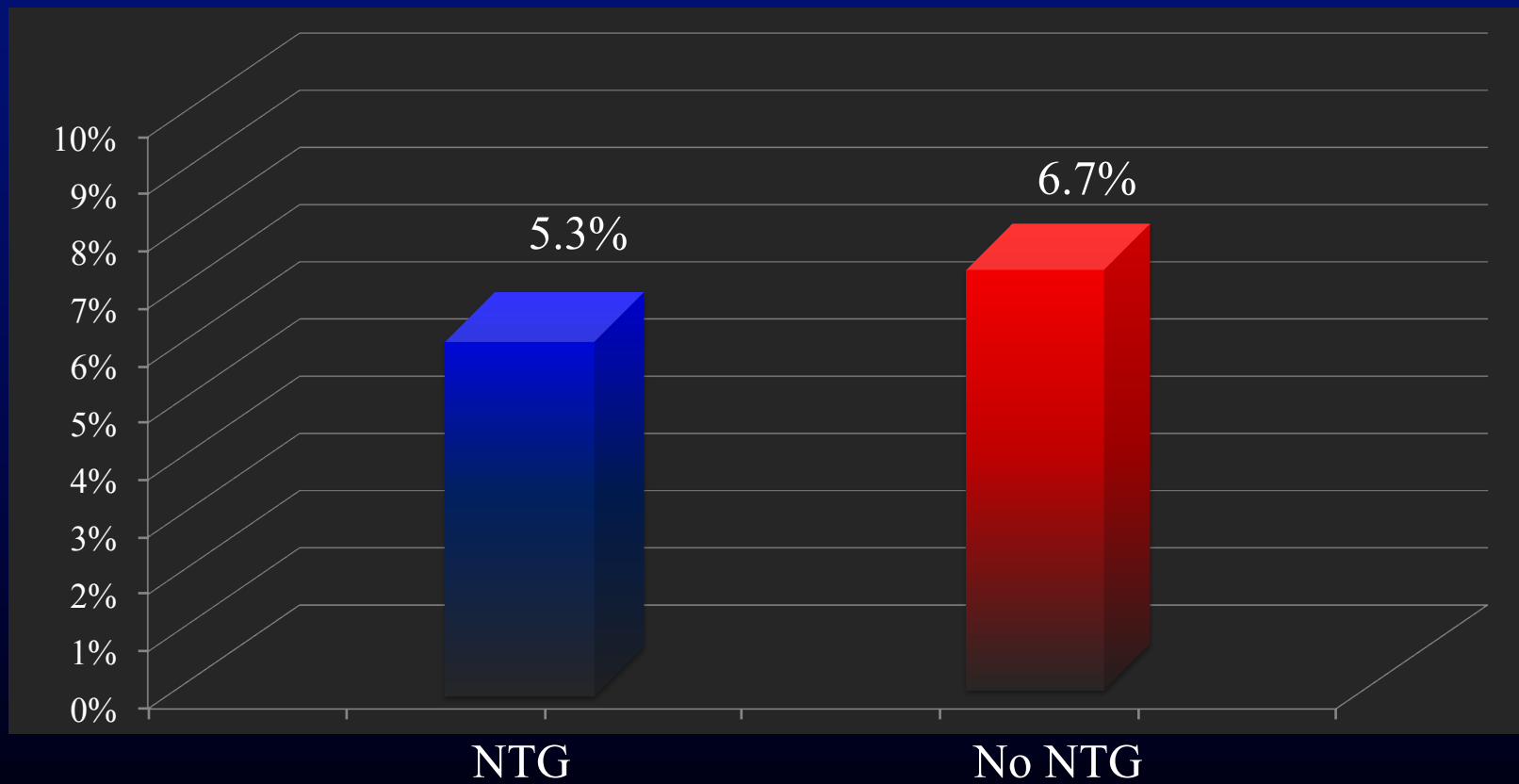
How safe is NTG in r/o AMI and does it effectively relieve pain?

- Prospective study, 780 pts, suspected STEMI
- LA County EMS and UCLA
- “Suspected STEMI” by ECG plus paramedic
- 0.4 mg SL NTG, up to 2 more doses
- BP < 100 mm SBP pts excluded

NTG in suspected STEMI

Systolic BP fall > 30 mm Hg

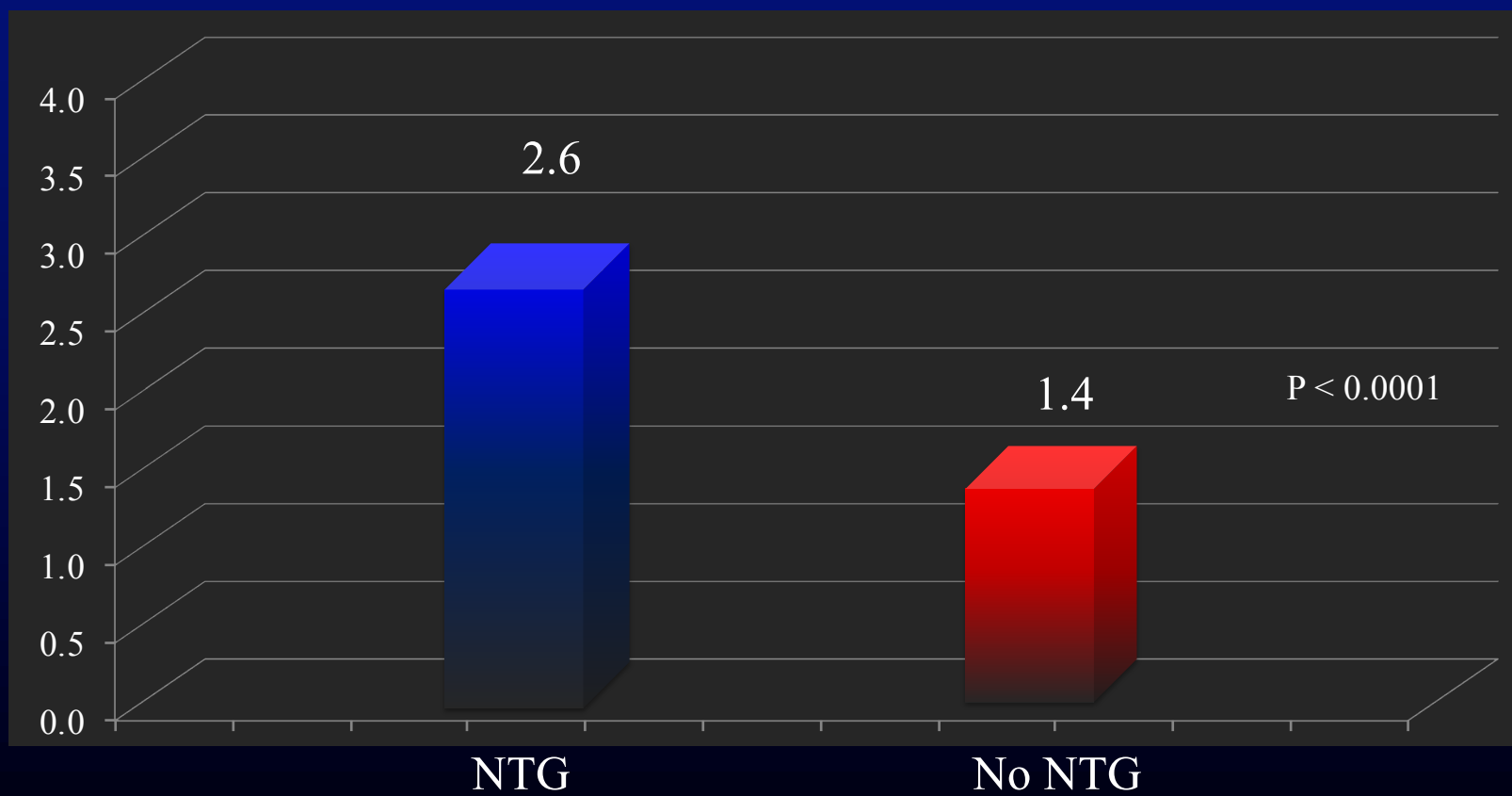
PreHospital Emerg Care 2019 online



NTG in suspected STEMI

Pain Relief

PreHospital Emerg Care 2019 online



NTG for r/o AMI

- NTG is safe in AMI
- NTG is safe for Inferior AMI
- NTG relieves Anginal pain in ACS
- *Respect NTG but use it*

IOs in CPR

Intraosseous versus Intravenous access in Patients with Out-of-Hospital Cardiac Arrest: Insights from the Resuscitation Outcomes Consortium Continuous Chest Compression Trial

Purav Mody ^{a, 2, 3}, Siobhan P. Brown ^b, Peter J. Kudenchuk ^c, Paul S. Chan ^{d, e}, Rohan Khara ^a, Colby Ayers ^a, Ambarish Pandey ^a, Karl Kern ^f, James A. de Lemos ^a, Mark S. Link ^a, Ahamed H. Idris ^g

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<https://doi.org/10.1016/j.resuscitation.2018.10.031>

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Resuscitation 2018 Online Dec

Do IO medication administrations improve outcomes in OHCA?

- 19,731 OHCA's: 3068 IO vs 16,663 IV
- ROC EMS study sites
- Dallas, Seattle, Kansas City, Tucson EMS
- IO patients younger, F > M
- Minimally faster med times with IO

Intraosseous versus Intravenous access in Patients with Out-of-Hospital Cardiac Arrest: Insights from the Resuscitation Outcomes Consortium Continuous Chest Compression Trial

Purav Mody ^{a, g, h}, Siobhan P. Brown ^b, Peter J. Kudenchuk ^c, Paul S. Chan ^{d, e}, Rohan Khera ^a, Colby Ayers ^a, Ambarish Pandey ^a, Karl Kern ^f, James A. de Lemos ^a, Mark S. Link ^a, Ahamed H. Idris ^g

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<https://doi.org/10.1016/j.resuscitation.2018.10.031>

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Resuscitation 2018 Online Dec

1:1 propensity match of 2274 IO pts was performed and after sensitivity analysis confirmed high quality:

- Lower Rate of Sustained ROSC with IO
- No Difference in Survival IO vs IV
- **NO Difference in Favorable Neurologic Outcomes**

IO vs IV

Take Homes

IO insertion is an excellent fast way to
obtain access in cardiac arrest
however IO use does not improve
outcomes in OHCA

Double Sequential Defibrillation

Title: Double sequential external defibrillation for refractory ventricular fibrillation out-of-hospital cardiac arrest: a systematic review and meta-analysis

Authors: Ashleigh Delorenzo, Ziad Nehme, James Yates, Stephen Bernard, Karen Smith

Resuscitation 2018; 135:124-29

How effective is Double Sequential Defibrillation?

- Systematic Review and Meta-Analysis
- 449 pts, 19% (95) treated by DSD
- 2 retrospective trials reviewed
- 58.7% arrests were witnessed
- Evaluated ROSC, hospital d/c, 30d survival

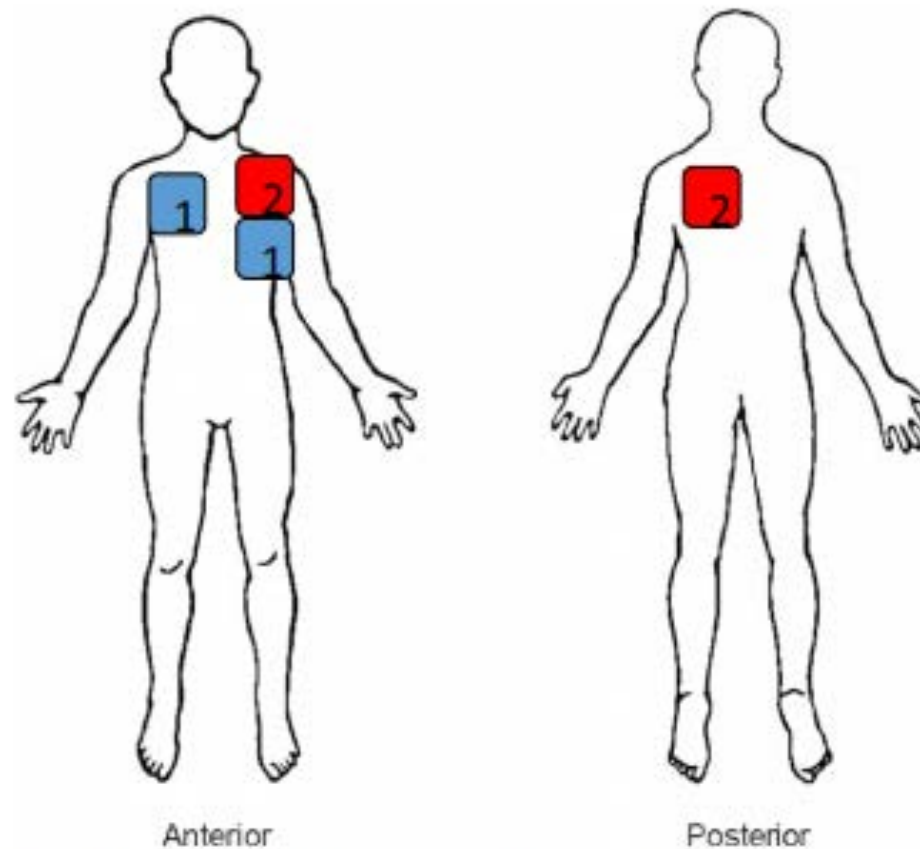


Figure 1. Graphic depiction of pad placement for DSD. The primary set of pads (blue) is placed in the anterolateral position. The second set of pads (red) is placed in the anterior/posterior orientation. DSD = double sequential defibrillation.

Prehospital Double Sequential Defibrillation: A Matched Case-Control Study

Julian G. Mapp MD, MPH✉, Alan J. Hans MD, Anthony M. Darrington MD, Elliot M. Ross MD, MPH, Calvin C. Ho MD, MS, David A. Miramontes MD, Stephen A. Harper MD, MPHfor ... See all authors ✓

First published: 10 December 2018 | <https://doi.org/10.1111/acem.13672>

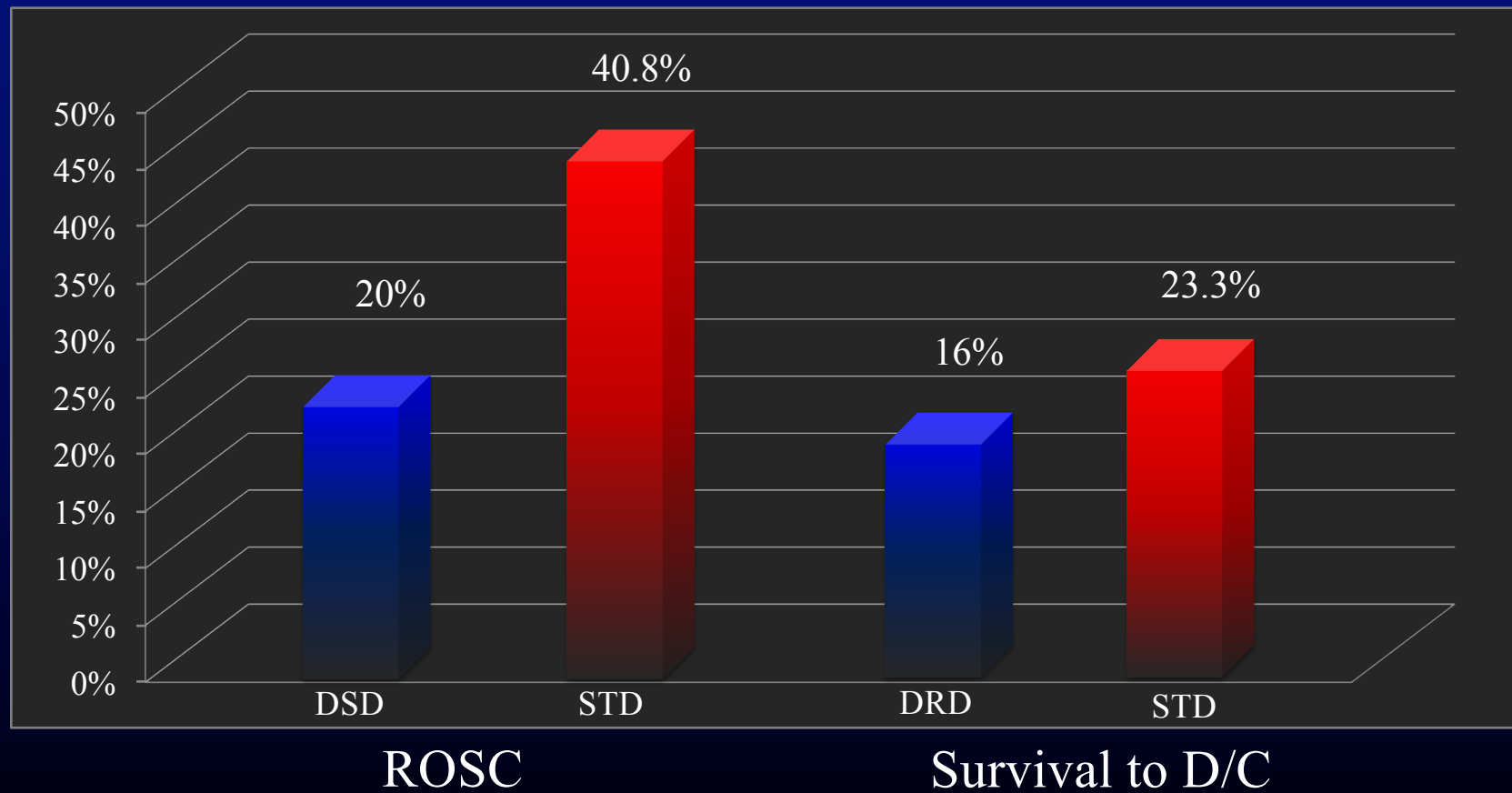
Acad Emerg Med 2019 in press Jan

Is DSD more effective in refractory VF?

- Matched case control comparison
- 205 patients with refractory VF (3 shocks)
- 64 DSD vs 64 Standard defibrillations
- 2 blinded observers; matched same year pts
- Same epi doses, downtimes, witnessed, bystander CPR

DSD vs Standard Defibrillation ROSC and Survival to Discharge

Acad Emerg Med 2019 in press Jan



“Our current protocol of considering DSD after the third conventional defibrillation in out-of-hospital cardiac arrest is ineffective”

Summary

Use high flow nasal O₂

Use Boujies

Cricoid NO

ETI experience takes time

Summary

NTG Yes

MAG No

IO ?

DSD No

Things keep changing





Certiably Well-Read: *The 12 Publications ABEM Wants Your Doc to Know*

Brian Clemency DO, MBA, FACEP, FAEMS
Associate Professor - University at Buffalo



American Board of
Emergency Medicine

BECOME
CERTIFIED

STAY
CERTIFIED

FOR PROGRAM
DIRECTORS

EMS 2018 LLSA Reading List

In This Section

Requirements by
Certification End Date

Lifelong Learning and
Self-Assessment

LLSA Requirements

Reading Lists

How to Submit LLSA
Articles

Improvement in Medical
Practice

ConCert™ Exam

Professionalism and
Professional Standing

CME Credit Available for
ABEM Activities

Regain Certification

Reciprocal Credit

EMS Systems and Provider Issues

Brown JB, Rosengart MR, Forsythe RM, Reynolds BR, Gestring ML, Hallinan WM, et al. Not all prehospital time is equal: influence of scene time on mortality. *J Trauma Acute Care Surg* Jul 2016;81(1):93-100.

Weaver MD, Patterson PD, Fabio A, Moore CG, Freiberg MS, Songer TJ. [An observational study of shift length, crew familiarity, and occupational injury and illness in emergency medical services workers](#). *Occup Environ Med* Nov 2015;72(11):798-804.

Medical Systems

Berkhemer OA, Fransen PS, Beumer D, van den Berg LA, Lingsma HF, Yoo AJ, et al.; MR CLEAN Investigators. [A randomized trial of intraarterial treatment for acute ischemic stroke](#). *N Engl J Med* Jan 2015;372(1):11-20.

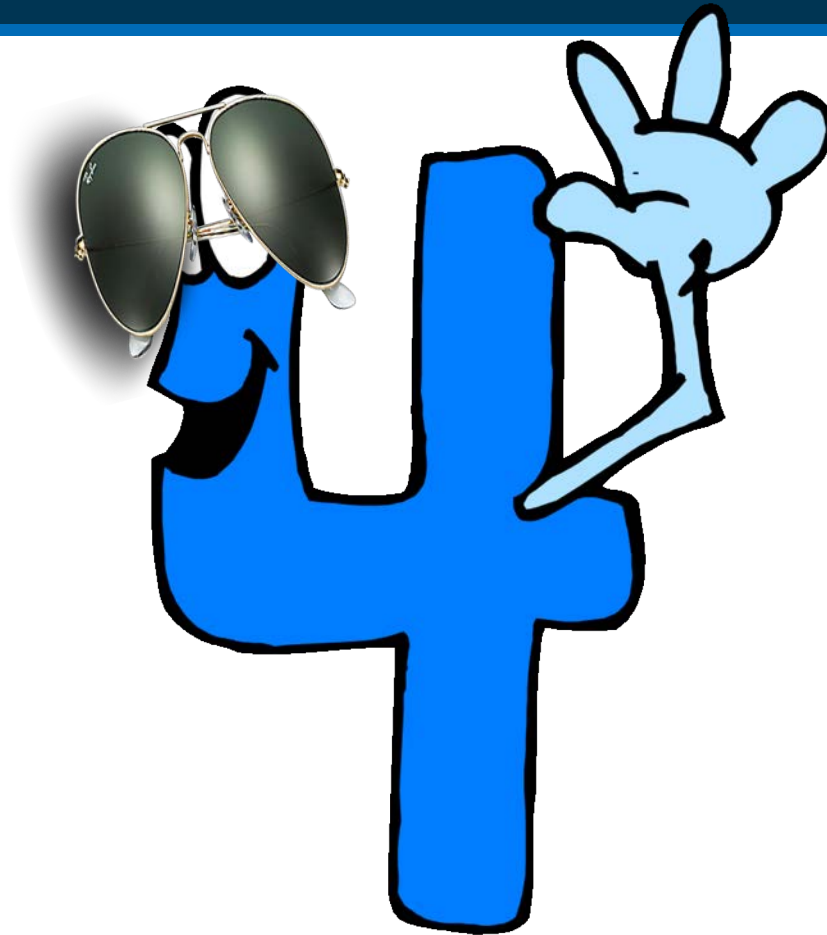
Out-of-Hospital Cardiac Arrest

Drennan IR, Lin S, Sidalak DE, Morrison LJ. Survival rates in out-of-hospital cardiac arrest patients transported without prehospital return of spontaneous circulation: an observational cohort study. *Resuscitation* Nov 2014;85(11):1488-93.

Nichol G, Leroux B, Wang H, Callaway CW, Sopko G, Weisfeldt M, Stiell I, Morrison LJ, et al.; ROC Investigators. [Trial of continuous or interrupted chest compressions during CPR](#). *N Engl J Med* Dec 2015;373(23):2203-14.

Prehospital Care of Medical Illness

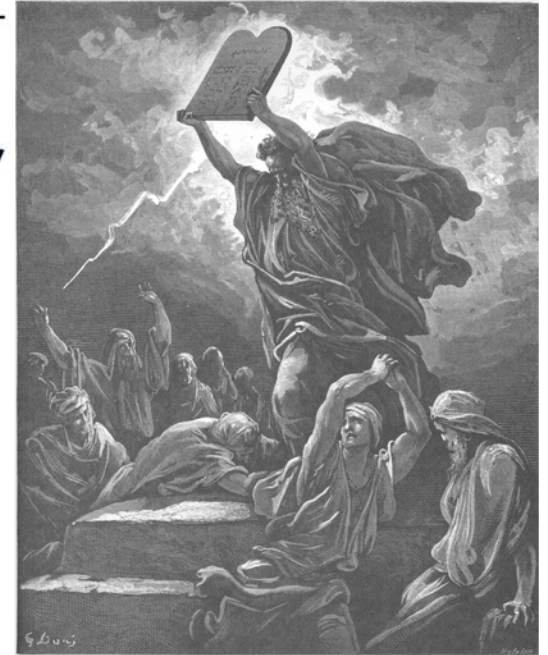
Fisher R, O'Donnell D, Ray B, Rusyniak D. [Police officers can safely and effectively administer intranasal naloxone](#). *Prehosp Emerg Care* 2016;20(6):675-80.



Not all prehospital time is equal: Influence of scene time on mortality

**Joshua B. Brown, MD, MSc, Matthew R. Rosengart, MD, MPH, Raquel M. Forsythe, MD,
Benjamin R. Reynolds, MPAS, PA-C, Mark L. Gestring, MD, William M. Hallinan, RN, MS, EMT-P,
Andrew B. Peitzman, MD, Timothy R. Billiar, MD, and Jason L. Sperry, MD, MPH, Pittsburgh, Pennsylvania**

J Trauma Acute Care Surg 2016, 81(1)

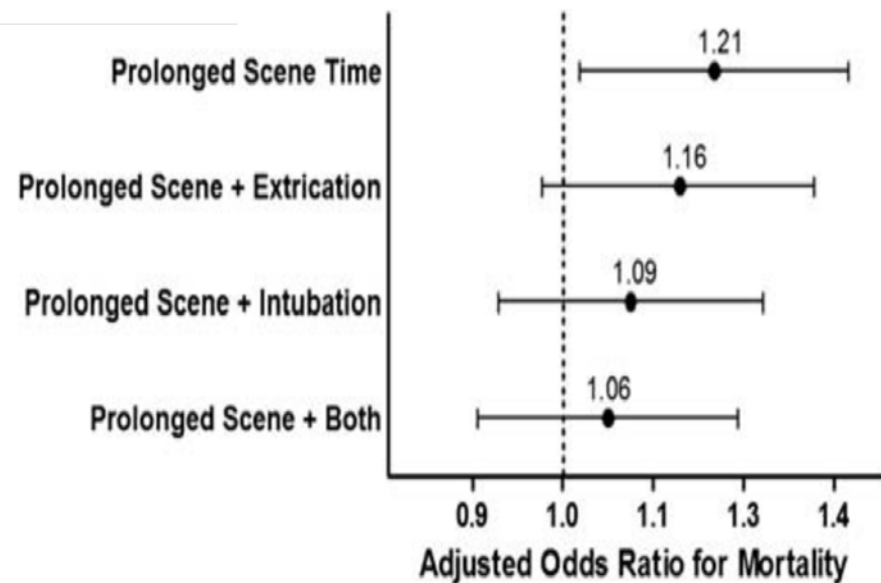


The 11th Commandment:
“Thou Shall Respond within
8 minutes, 90% of the time.”

Not all prehospital time is equal: Influence of scene time on mortality

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Andrew B. Peitzman, MD, Timothy R. Billiar, MD, and Jason L. Sperry, MD, MPH, Pittsburgh, Pennsylvania

J Trauma Acute Care Surg 2016, 81(1)



The NEW ENGLAND
JOURNAL of MEDICINE

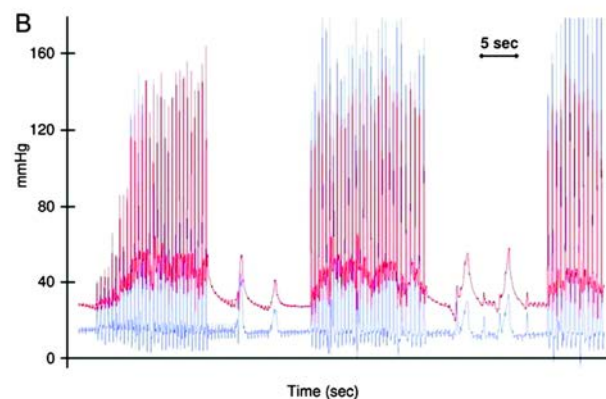
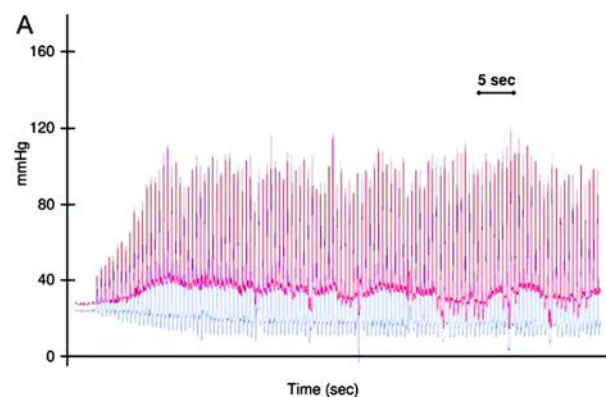
ESTABLISHED IN 1812

DECEMBER 3, 2015

VOL. 373 NO. 23

**Trial of Continuous or Interrupted Chest Compressions
during CPR**

Graham Nichol, M.D., M.P.H., Brian Leroux, Ph.D., Henry Wang, M.D., Clifton W. Callaway, M.D., Ph.D., George Sopko, M.D., Myron Weisfeldt, M.D., Ian Stiell, M.D., Laurie J. Morrison, M.D., Tom P. Aufderheide, M.D., Sheldon Cheskes, M.D., Jim Christenson, M.D., Peter Kudenchuk, M.D., Christian Vaillancourt, M.D., Thomas D. Rea, M.D., Ahamed H. Idris, M.D., Riccardo Colella, D.O., M.P.H., Marshal Isaacs, M.D., Ron Straight, Shannon Stephens, Joe Richardson, Joe Condle, Robert H. Schmicker, M.S., Debra Egan, M.P.H., B.S.N., Susanne May, Ph.D., and Joseph P. Ornato, M.D., for the ROC Investigators*



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	Intervention Group	Control Group	Adjusted Difference (95% CI)	P value
Survival to Discharge	9.0%	9.7%	−0.7 (−1.5 to 0.1)	0.07
MRS ≤ 3	7.0%	7.7%	−0.6 (−1.4 to 0.1)	0.09

EDUCATION AND PRACTICE

PATIENTS IMMOBILIZED WITH A LONG SPINE BOARD RARELY HAVE UNSTABLE THORACOLUMBAR INJURIES

Brian M. Clemency, DO, MBA, Joseph A. Bart, DO, Abhigyan Malhotra, Taylor Klun,
Veronica Campanella, Heather A. Lindstrom, PhD

PREHOSPITAL EMERGENCY CARE 2016;20:266–272

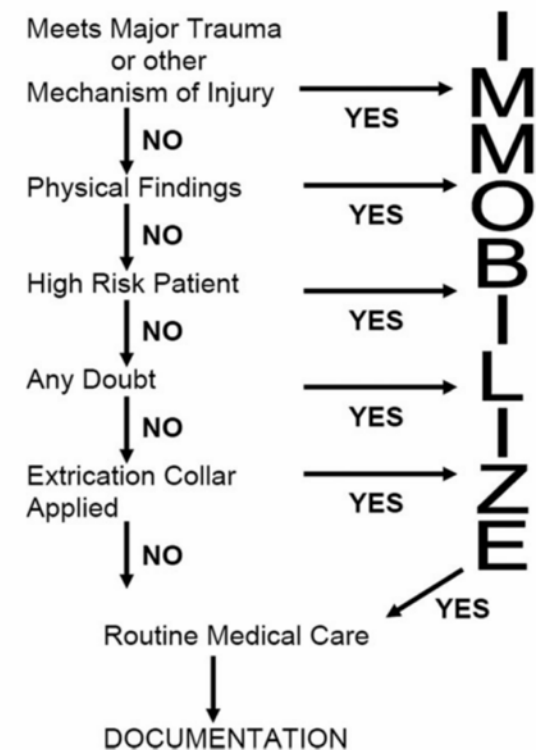


FIGURE 1. Spinal Injury Protocol flow chart.

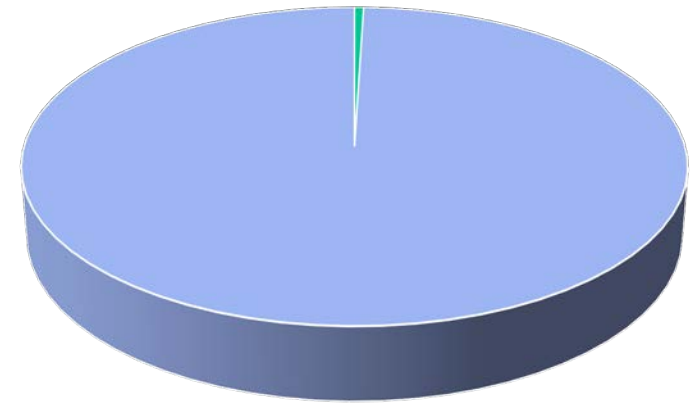
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PREHOSPITAL EMERGENCY CARE 2016;20:266–272

0.5% of backboarded patients
had an unstable TLS fracture



0 of the 951 patients who were
backboarded after a ground level fall
had an unstable TLS fracture

ORIGINAL ARTICLE

An observational study of shift length, crew familiarity, and occupational injury and illness in emergency medical services workers

Matthew D Weaver,^{1,2,3} P Daniel Patterson,⁴ Anthony Fabio,⁵ Charity G Moore,⁶ Matthew S Freiberg,⁷ Thomas J Songer⁵

Weaver MD, *et al. Occup Environ Med* 2015;**72**:798–804.



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Matthew S Freiberg,⁷ Thomas J Songer⁵

Weaver MD, *et al. Occup Environ Med* 2015;**72**:798–804.

- Shift length increased risk of injury
- Working with an unfamiliar partner did not

What have we learned?

- Don't dawdle on scene
- Good 30:2 worked just fine
- Thank goodness we are not still backboarding everyone
- Longs shifts may be hazardous to your health
- Yes.... your medical director has to do CME too