

The Five Most Important EMS Articles of this Past Year

EAGLES 2018

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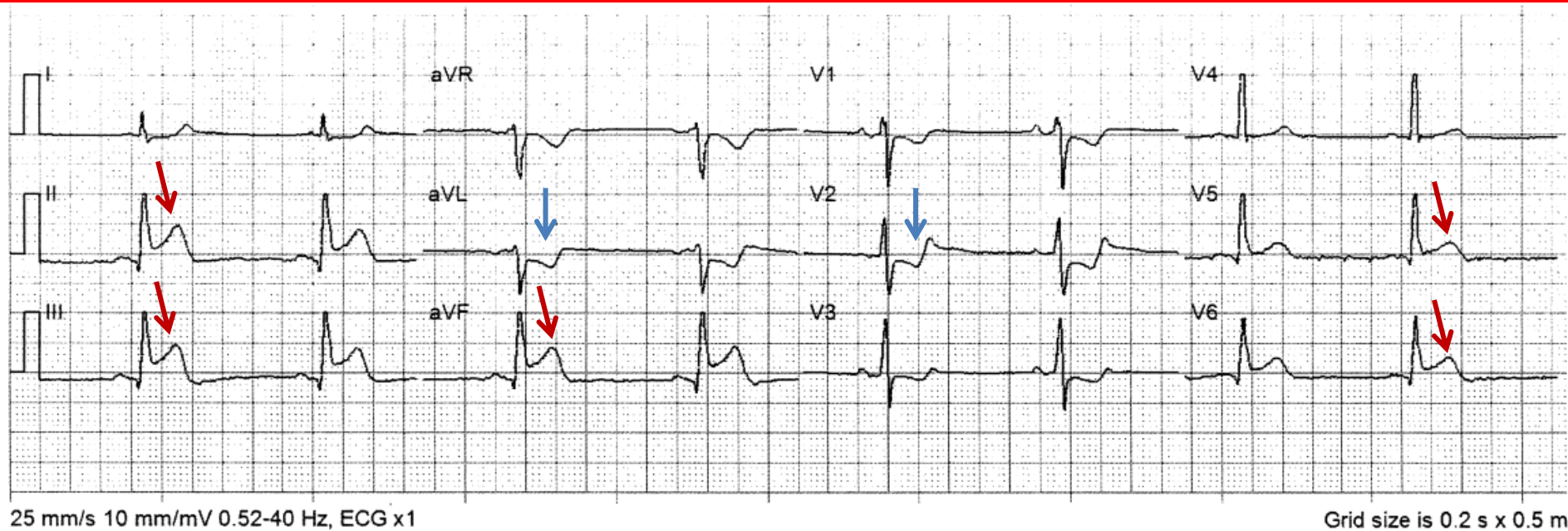
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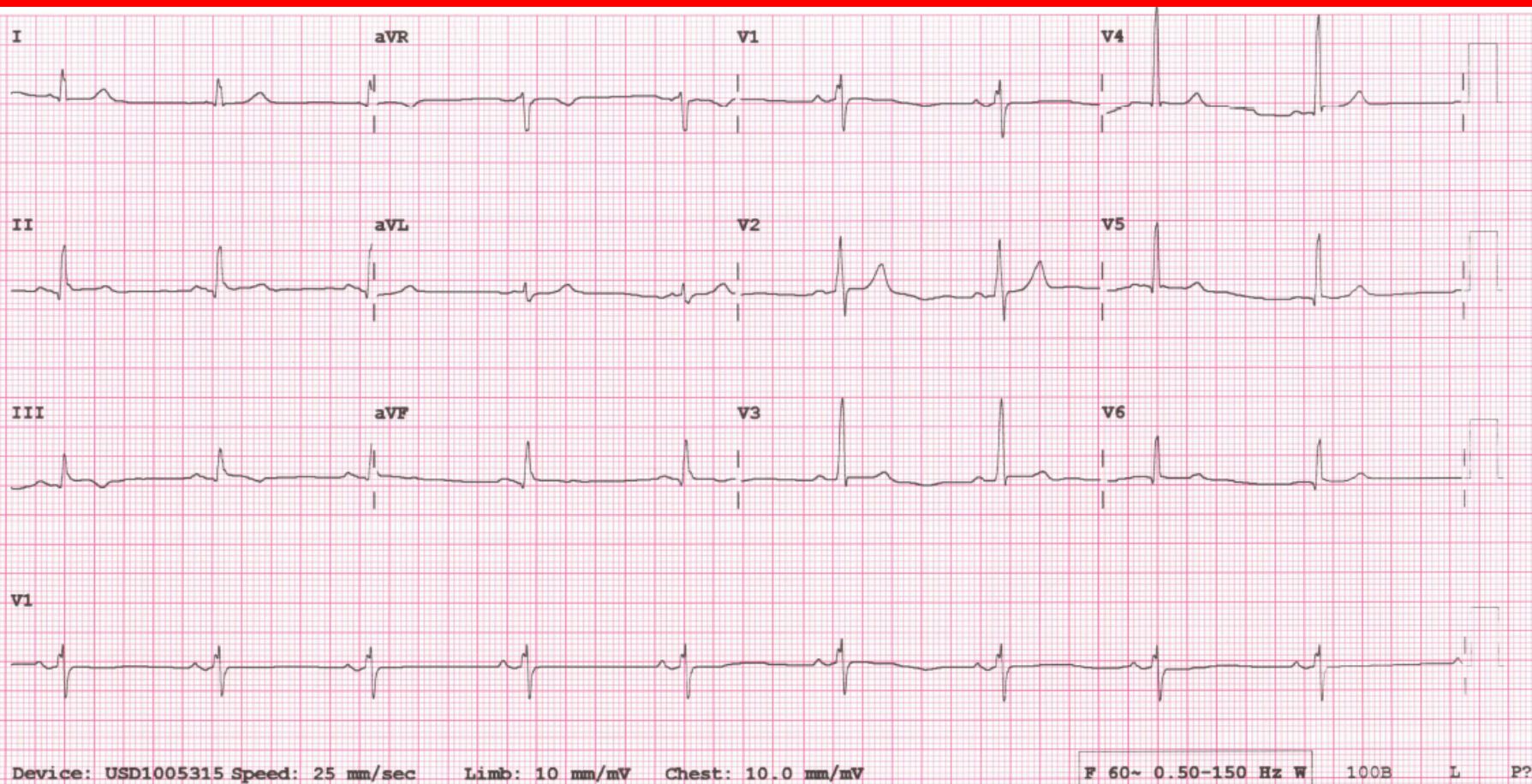
Prehospital STEMI

EMS ECG



STJ	I	II	III	aVR	aVL	aVF	V1	V2	V3	V4	V5	V6
	-0.52	2.32	2.84	-0.91	-1.68	2.58	-1.22	-1.94	-0.94	0	0.71	1.37

ED ECG 12 minutes later



DETECTION OF STEMI USING PREHOSPITAL SERIAL 12-LEAD ELECTROCARDIOGRAMS

Alain Tanguay, MD, Johann Lebon, PhD, Lorraine Lau, MD, Denise Hébert, BSc,
François Bégin, MD

ABSTRACT

Objective: Repeated or serial 12-lead electrocardiograms (ECGs) in the prehospital setting may improve management of patients with subtle ST-segment elevation (STE) or with a ST-segment elevation myocardial infarction (STEMI) that

tent STE or a dynamic STE that evolved over time. **Results:** A total of 754 suspected STEMI patients were transported by EMS during the study period. Of these, 728 patients met eligibility criteria and were included in the analysis. A persistent STE was observed in 84.3% (614/728) of patients,

Prehosp Emerg Care 2018; ePub Jan

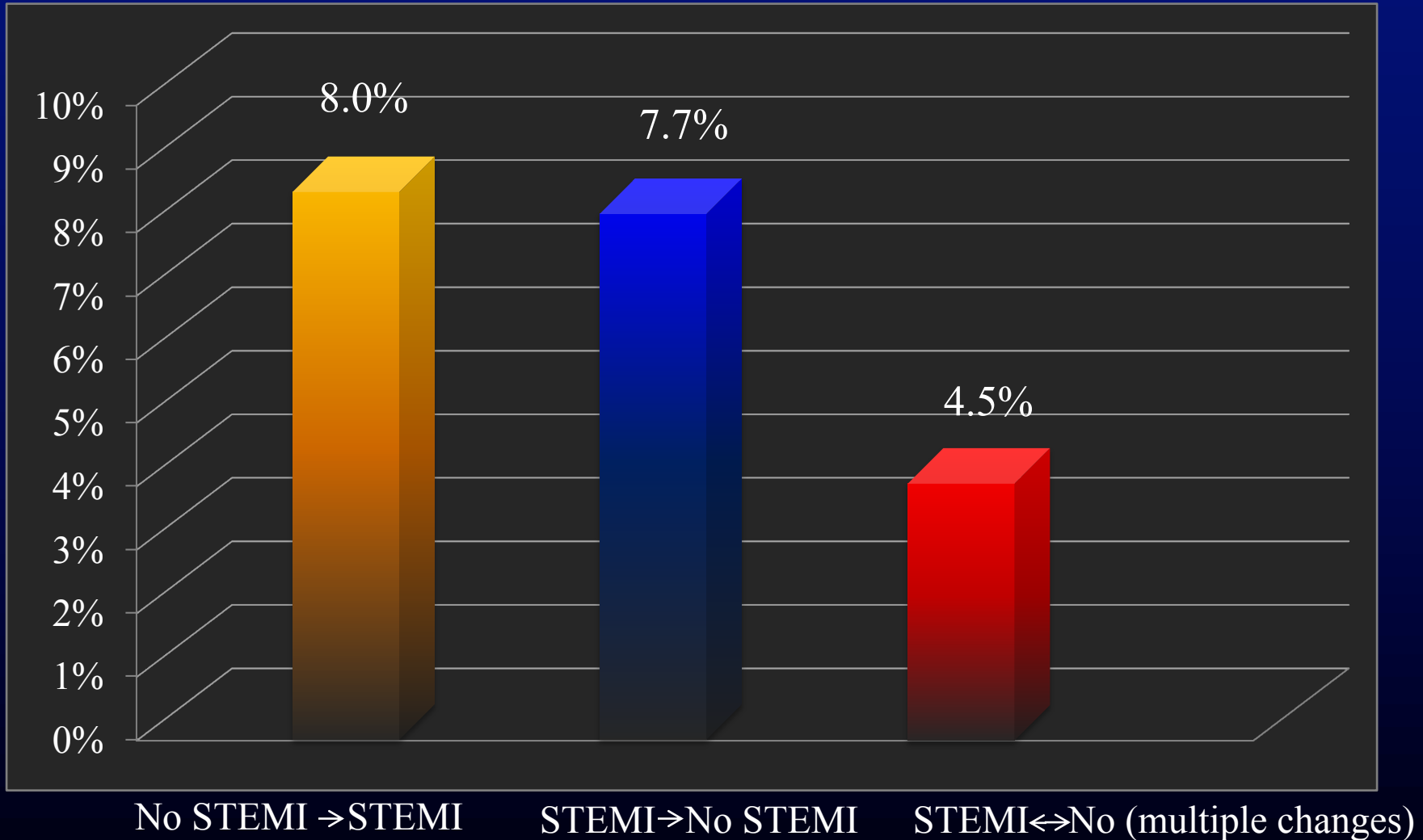
Do serial 12 leads during EMS transport add any useful information in diagnosing a STEMI?

- 728 STEMI transports, Quebec EMS
- Used BLS-EMTs transmitting Q 2 minutes
- 24 minute average transport time (15-38)
- “Persistent” STEMI vs “Evolution” vs “Loss”

Dynamic STEMI ECGs

15.7% (114 / 728)

Prehosp Emerg Care 2018; ePub Jan



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Results

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- 84.3% of STEMIs were persistent
- 15.7% of STEMIs were dynamic
- 8% of STEMIs not evident on first ECG

Some STEMIs stay persistent

Some STEMIs “come and/or go”

Prehosp Emerg Care 2018; ePub Jan

Lower Dose
Epinephrine in
Cardiac Arrest



ELSEVIER

Contents lists available at ScienceDirect

Resuscitation

journal homepage: www.elsevier.com/locate/resuscitation



Clinical paper

Lower-dose epinephrine administration and out-of-hospital cardiac arrest outcomes[☆]



Cameron A. Fisk^a, Michele Olsufka^b, Lihua Yin^c, Andrew M. McCoy^c, Andrew J. Latimer^c, Charles Maynard^d, Graham Nichol^e, Jonathan Larsen^f, Leonard A. Cobb^b, Michael R. Sayre^{c,f,*}

Resuscitation 2018;124:43-48

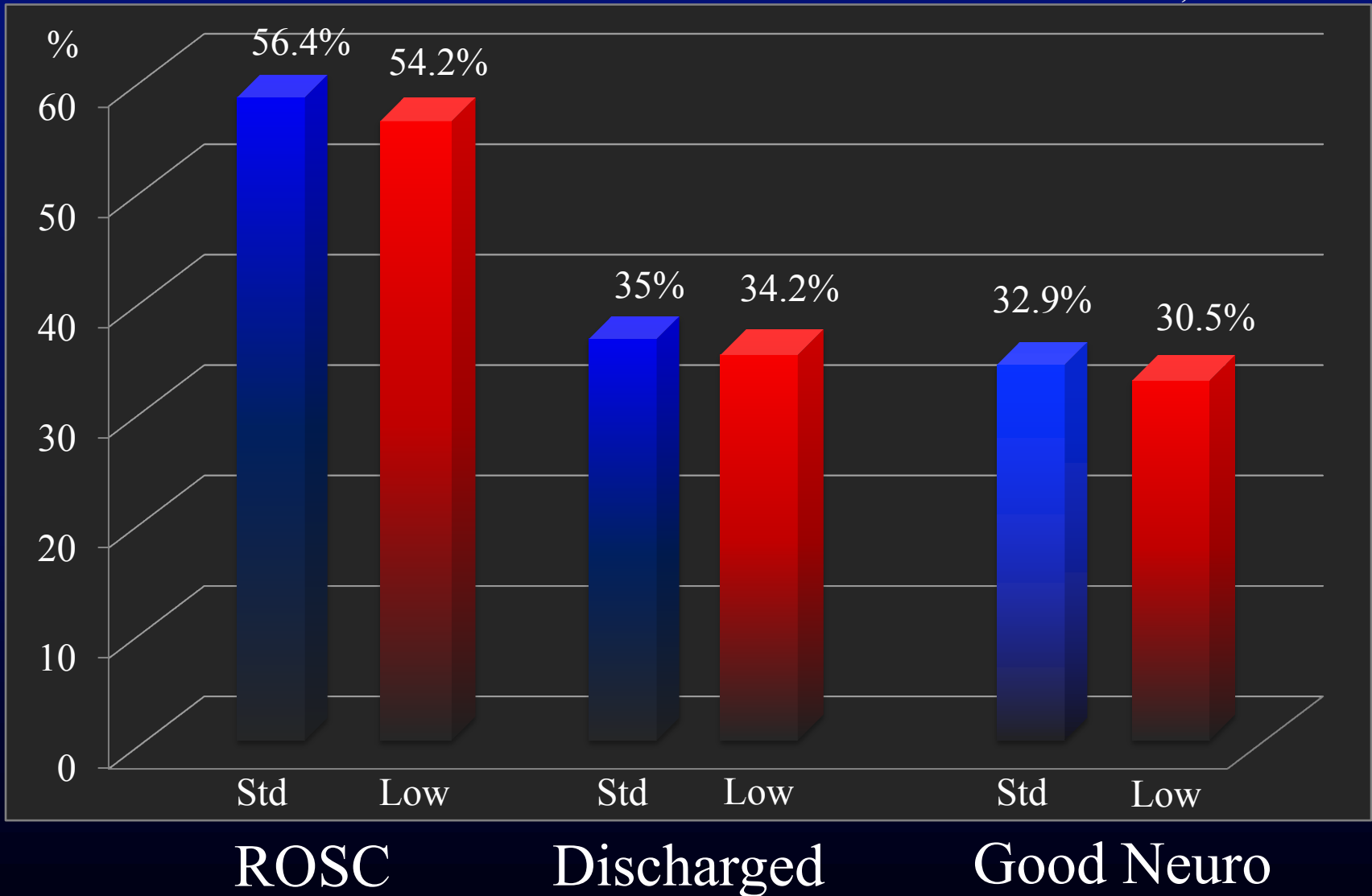
Could less than 1.0 mg be better dose of epinephrine?

- 2,255 pts from Seattle, 2008-2016
- 554 (24.6%) VF/VT; 1,701 (75.4%) AS/PEA
- Before and after type study
- VF/VT: 0.5 mg min 4, 8; AS/PEA: 0.5 mg Q 2 min
- Evaluated ROSC, Discharge, CPC 1-2

VF/VT Outcomes

0.5 mg vs 1.0 mg Epinephrine

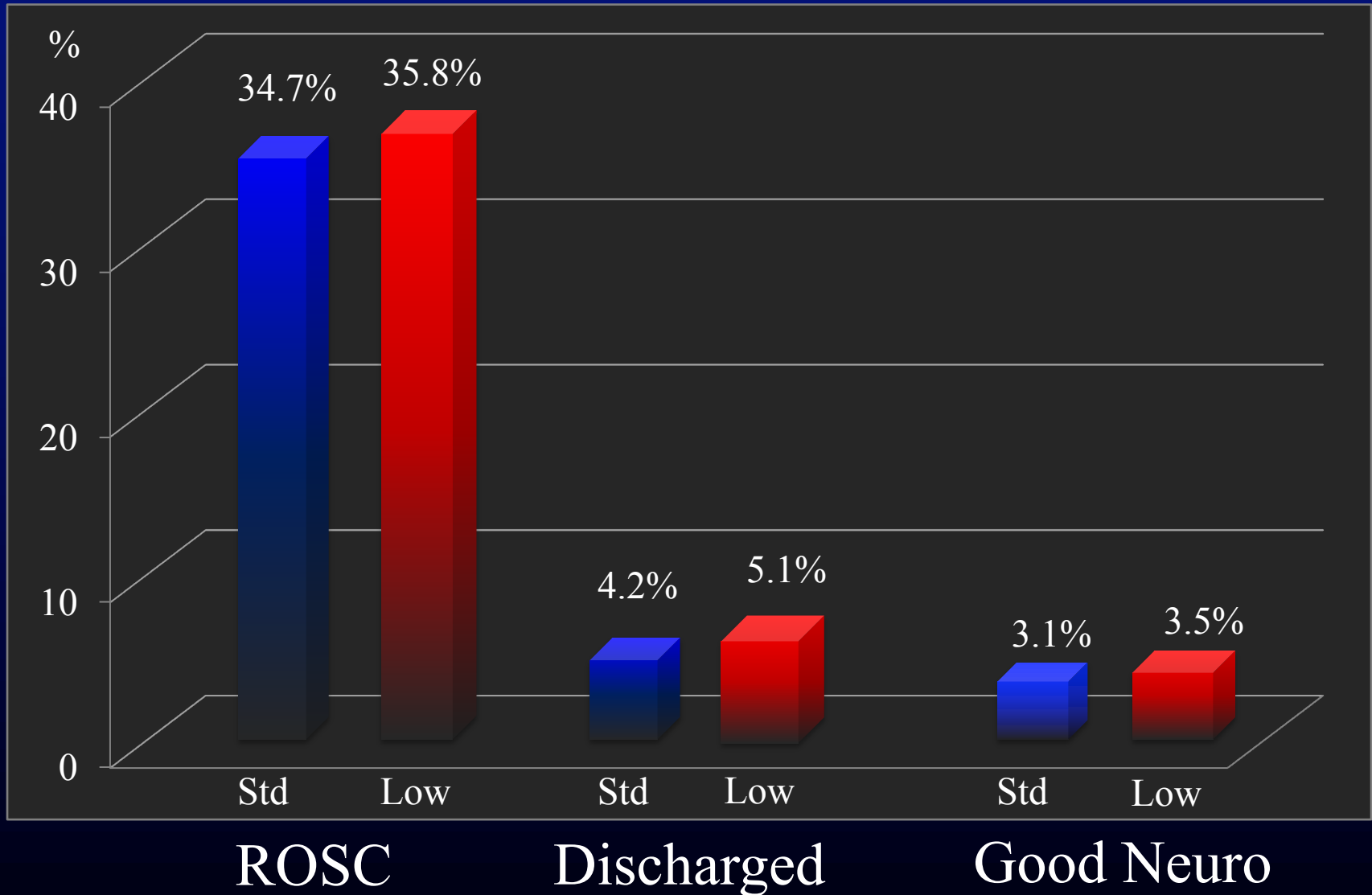
Resuscitation 2018;124:43-48



AS / PEA Outcomes

0.5 mg vs 1.0 mg Epinephrine

Resuscitation 2018;124:43-48



Low Dose Epinephrine Take Homes

- Not a randomized trial
- Cross overs from either group
- 3.4 mg vs 2.6 mg in VF/VT;
3.5 mg vs 2.8 mg in AS/PEA

Reducing the dose of epinephrine in OOH cardiac arrests does not affect ROSC, hospital discharge frequency or neurologic outcomes in either shockable or non-shockable rhythms

VFib

Refractory VFib

- Move pads Ant-Lat \leftrightarrow Ant-Post
- Consider Beta Blockade
- Consider Double Sequential Defibrillation (DSD)
- PCI
- ECMO



Clinical paper

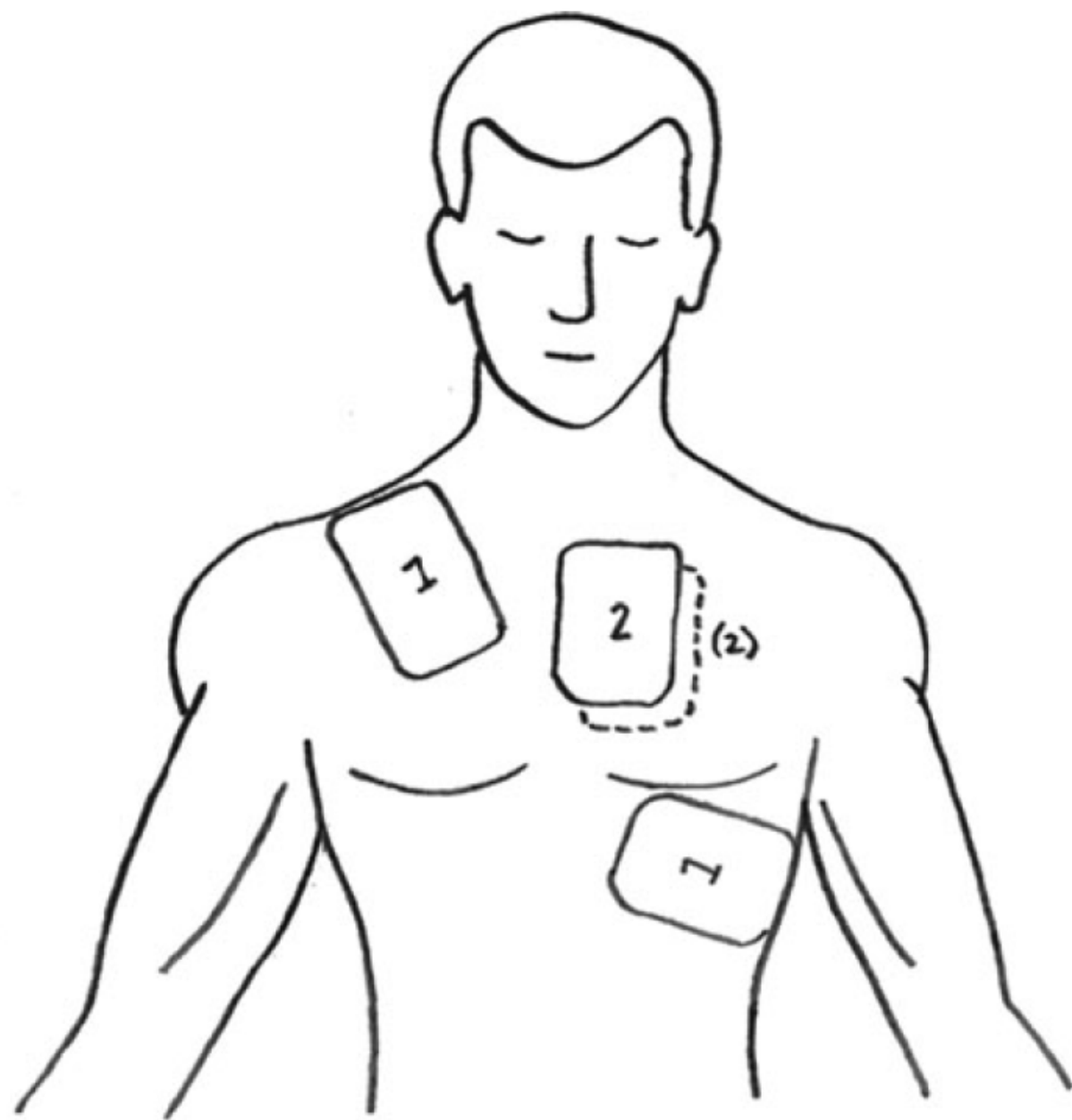
Double sequential defibrillation therapy for out-of-hospital cardiac arrests: the London experience [☆]

Amber C. Emmerson^a, Mark Whitbread^b, Rachael T. Fothergill^a 

Resuscitation 2017;117:97-101

Is double sequential defibrillation (DSD) beneficial in refractory VF/pVT?

- 45 patients treated with DSD
- Retrospective observational study
- London Ambulance Service
- Compared to 175 who got standard defibrillation
- Only patients with ≥ 6 shocks compared



Clinical paper

Double sequential defibrillation therapy for out-of-hospital cardiac arrests: the London experience [☆]

Amber C. Emmerson², Mark Whitbread², Rachael T. Fothergill² 

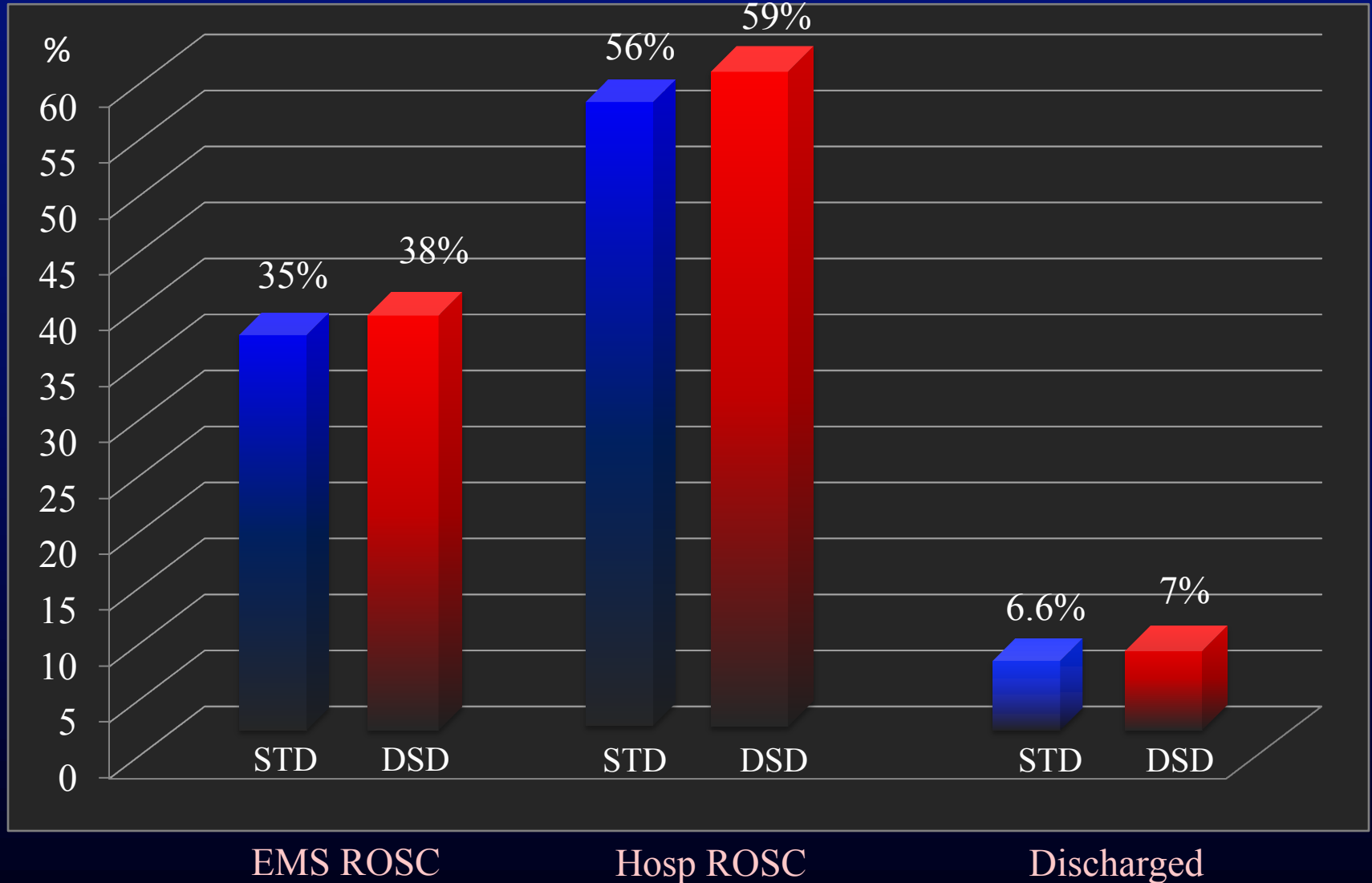
Resuscitation 2017;117:97-101

Double Sequential Protocol

- 3 standard Ant-Lat defibrillations
- Anti-arrhythmic administration
- 3 standard Ant-Post defibrillations
- Double sequential defibrillation
- Done 3 – 4 seconds apart

Standard vs DSD in VF/pVT

Resuscitation 2017;117:97-101



Double Sequential Defibrillation Take Homes

- Not a randomized trial
- Many pts got up to 10 shocks pre DSD
- The role of Double Sequential Defibrillation is not yet clarified and needs a randomized larger trial

External Defibrillator Damage Associated With Attempted Synchronized Dual-Dose Cardioversion



Neal S. Gerstein, MD, FASE*; A. Robb McLean, MD, MHCM; Eric C. Stecker, MD, MPH; Peter M. Schulman, MD

*Corresponding Author. E-mail: ngerstein@gmail.com.

The simultaneous use of 2 external defibrillators to administer either dual or sequential cardioversion or defibrillation for refractory cardiac arrhythmias is increasing in both the out-of-hospital and in-hospital settings. Using 2 defibrillators to

Annals Emergency Medicine 2018;71:109-12

Is Dual Sequential Defibrillation (DSD) dangerous to the defibrillators?

- Zoll M and/or Physio-Control LP 15s
- Two DSDs: 1 Zoll & 1 LP @ 560 J synched
- Two DSDs with 2 LPs at combined 720 J
- All 4 DSDs done A-P
- One LP found to become nonfunctional

External Defibrillator Damage Associated With
Attempted Synchronized Dual-Dose Cardioversion



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“LIFEPAK defibrillators comply with standards which require defibrillators to withstand defibrillation shocks from a second defibrillator connected to a patient. This testing does not include delivering simultaneous/sequential or overlapping 360 J defibrillation shocks from two LIFEPAK defibrillators. There are no design and/or safety standards for use of external defibrillators to perform double sequential defibrillation. We cannot guarantee the reliability of functionality of devices subject to this off-label use. **Product warranty cannot legally cover damage to LIFEPAK defibrillators which occurs as a result of performing an off-label use”**

Dual Sequential Defibrillation

Take Homes

- May not be more effective
- May damage defibrillator
- Is a crowd pleaser

Association of Out-of-Hospital Hypotension Depth and Duration With Traumatic Brain Injury Mortality



Daniel W. Spaite, MD*; Chengcheng Hu, PhD; Bentley J. Bobrow, MD; Vatsal Chikani, MPH; Bruce Barnhart, RN, CEP; Joshua B. Gaither, MD; Kurt R. Denninghoff, MD; P. David Adelson, MD; Samuel M. Keim, MD, MS; Chad Viscusi, MD; Terry Mullins, MBA; Amber D. Rice, MD, MS; Duane Sherrill, PhD

*Corresponding Author. E-mail: dan@aemrc.arizona.edu.

Study objective: Out-of-hospital hypotension has been associated with increased mortality in traumatic brain injury. The

Ann Emerg Med 2017;70:522-30

How deleterious is hypotension in patients with traumatic brain injury (TBI)?

- 7,251 TBI pts ages 10 and older
- Statewide EMS database for Arizona
- Median age 40 yo; IQR 24-58 yo
- 7.2% (539) of patients had BP < 90 mm Hg
- Evaluated time and depth spent hypotensive

“Dose of Hypotension”

$90 - \text{SBP} = \text{Depth of Hypotension} \times \text{Minutes}$

Hypotension “Dose”

Annal Emerg Med 2017;70:522-30

Each 2 fold increase in hypotension dose,
increased mortality by 20%

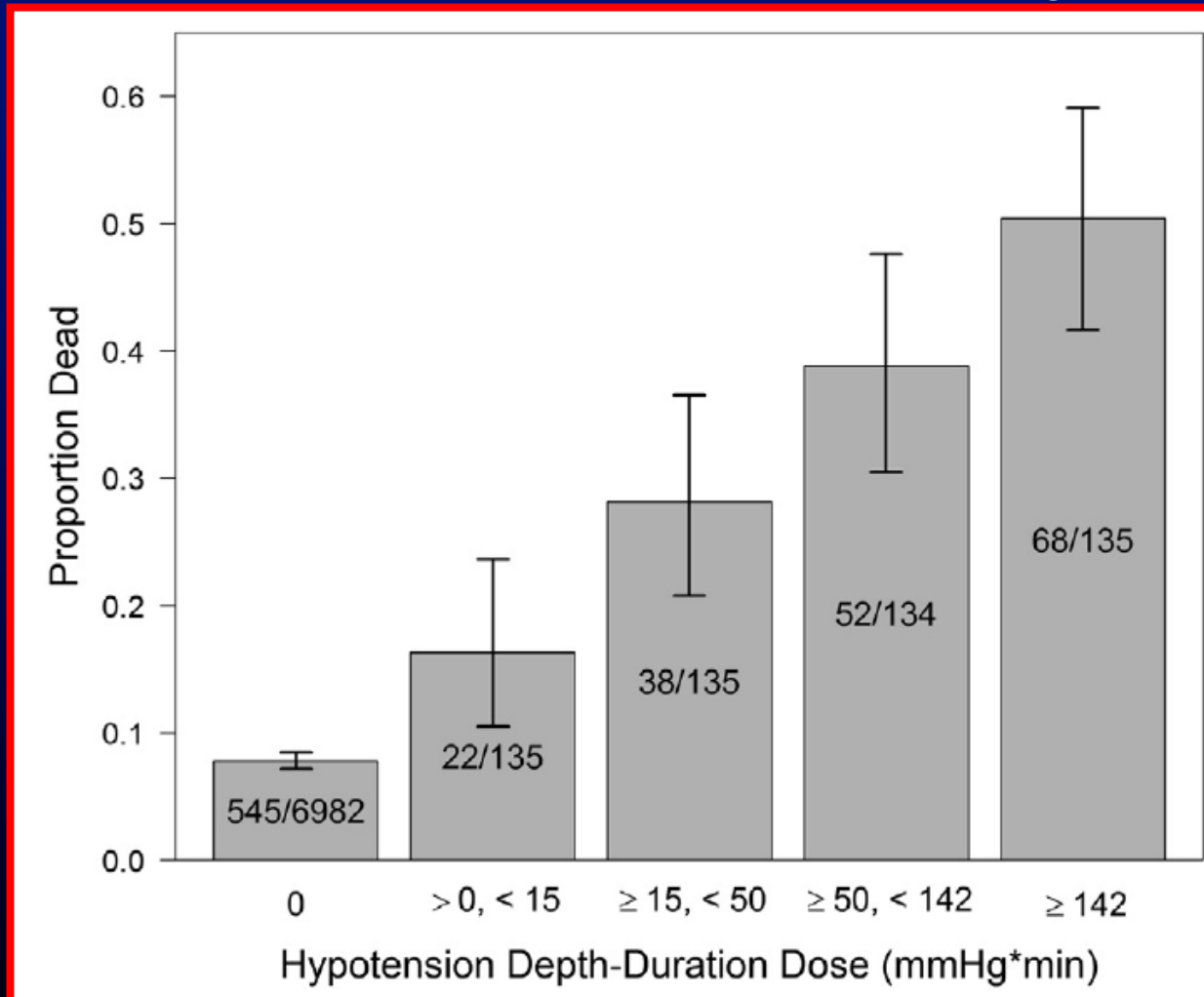
10 minutes at 80 SBP = dose of $10 \times 10 = 100$

10 minutes at 70 SBP = dose of $10 \times 20 = 200$

Thus 10 minutes at 70 mm Hg increases
mortality 20% over 10 minutes at 80 mm Hg

Depth and Duration of Hypotension vs Mortality

Ann Emerg Med 2017;70:522-30



Hypotension in TBI

Take Homes

- Dramatically increases mortality
 - $\uparrow 20\%$ for each doubling of dose (time x 90-SBP)
 - Is Sys BP 90, 100, or 120 SBP optimal s/p TBI?
- Avoid hypotension, treat hypotension

Depth and Length of Hypotension
in TBI are both critical!

IMPLEMENTATION OF A PREHOSPITAL PROTOCOL CHANGE FOR ASTHMATIC CHILDREN

Anriada Nassif, MD, Daniel G. Ostermayer, MD, Kim B. Hoang, MD, Mary K. Claiborne, MD, Elizabeth A. Camp, PhD, Manish I. Shah, MD MS

ABSTRACT

Background: Respiratory distress due to asthma is a common reason for pediatric emergency medical services

asthma exacerbation transported by an urban EMS system to 10 emergency departments over 2 years. The investigators implemented an EMS protocol update one year into



Prehosp Emerg Care 2018; ePub Jan

Do prehospital steroids affect children's ED course and does switching to oral steroids increase EMS administration

- 482 patients, retrospective matched study
- Houston Fire EMS, Baylor & UT Houston Hospitals
- Evaluated LOS, hospitalization, invasive airways

This is a before and after study adding oral dexamethasone to protocol for all asthmatics rather than just IV steroids for moderate and severe asthma (226 pre vs 256 post)

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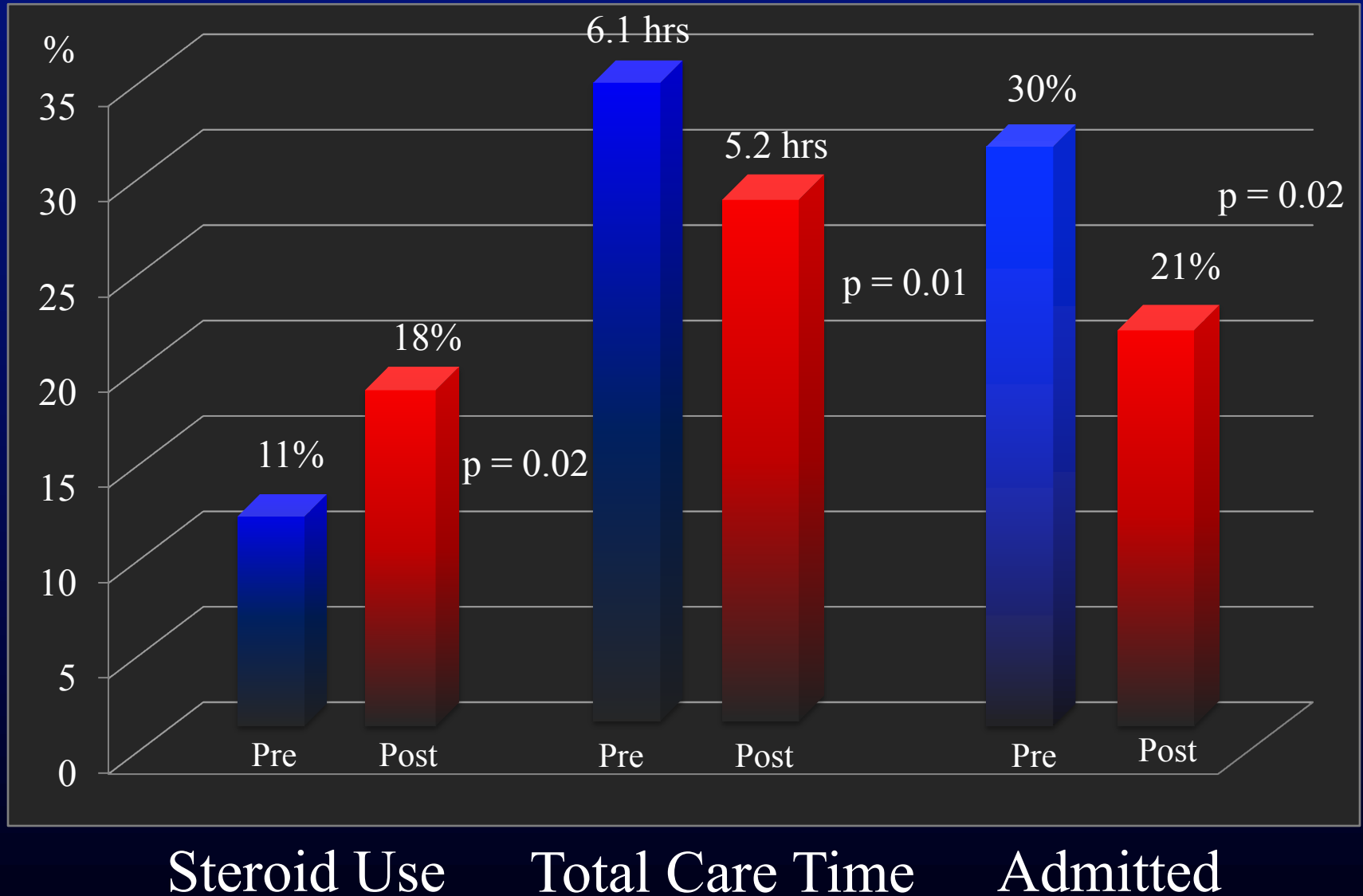
asthma exacerbation transported by an urban EMS system to 10 emergency departments over 2 years. The investigators implemented an EMS protocol update one year into the study period.

Prehosp Emerg Care 2018; ePub Jan

Compares use of 2 mg/kg of IV/IM methylprednisolone (max 125 mg) for moderate-severe asthma to: Dexamethasone 0.6 mg/kg (max 10 mg) PO tolerated for any asthmatic including mild asthma – allows IV if PO not tolerated

Affects of Steroid Use

Prehosp Emerg Care 2018; ePub Jan



Prehospital Steroid Use In Children Take Homes

- First EMS steroid study in children
- PO steroids easy to dose
- No IV required
- Cut ICU admits in $\frac{1}{2}$ (82% vs 44%)
- Looks protocol changing

Summary

Repeat 12 leads often

Epi half dose not helpful

Be careful with double sequential

Beware hypotension s/p TBI

EMS steroids...Giddy up



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