

EAGLES 2023

5 Most Important Articles

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Nashville, TN

One and Done Epinephrine
Double Sequential Defibrillation (DSD)
Optimal TQ Pacer Pad Location
Nitroglycerin in Inferior and RV AMIs
Optimal Systolic Blood Pressure in TBI

PARKING
HOSPITAL S



Epinephrine in Cardiac Arrest

One and Done Epinephrine in Out-of-Hospital Cardiac Arrest? Outcomes in a Multiagency United States Study

Nicklaus P. Ashburn [✉](#), MD, Bryan P. Beaver, MD, Anna C. Snaveley, PhD, Niaman Nazir, MD, MPH, James T. Winslow, MD, MPH,
R. Darrell Nelson, MD, Simon A. Mahler, MD, MS & Jason P. Stopyra, MD, MS [...show less](#)

Prehosp Emerg Care 2022;26:1-7

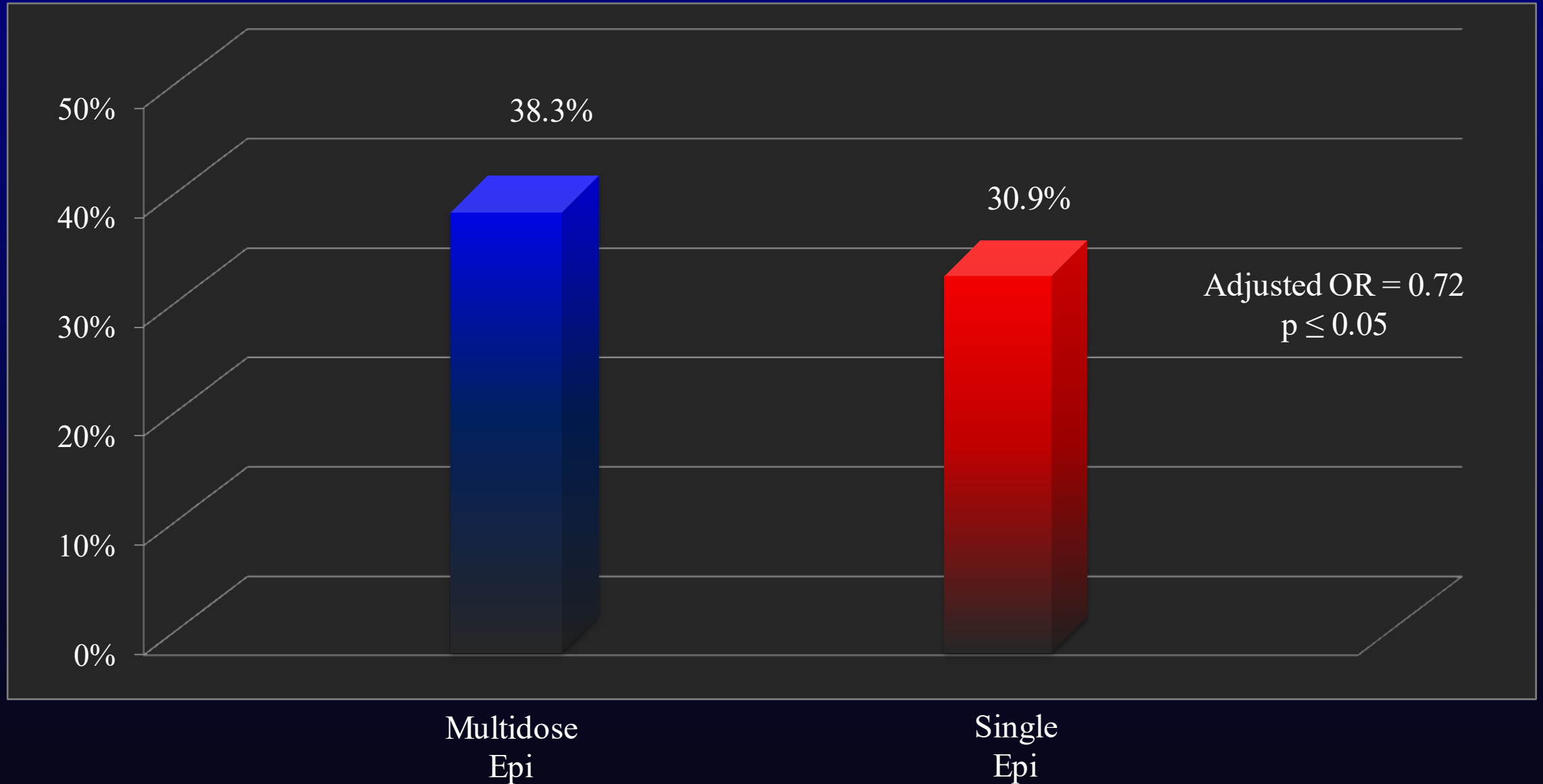
How Does a Single Dose of Epinephrine Compare to Q 3-5 min Dosing in Adult Cardiac Arrest?

- 1690 cardiac arrest patients 18 or older
- CARES Registry, 5 EMS County Systems in North Carolina
- 899 Multidose Epi pts vs 799 with only a Single Epi dose
- Age, sex, shockable vs non-shockable, witnessed, AED use
- EMS response times and Bystander vs None also analyzed

Study included patients from **Urban**,
Suburban and **Rural** EMS Systems

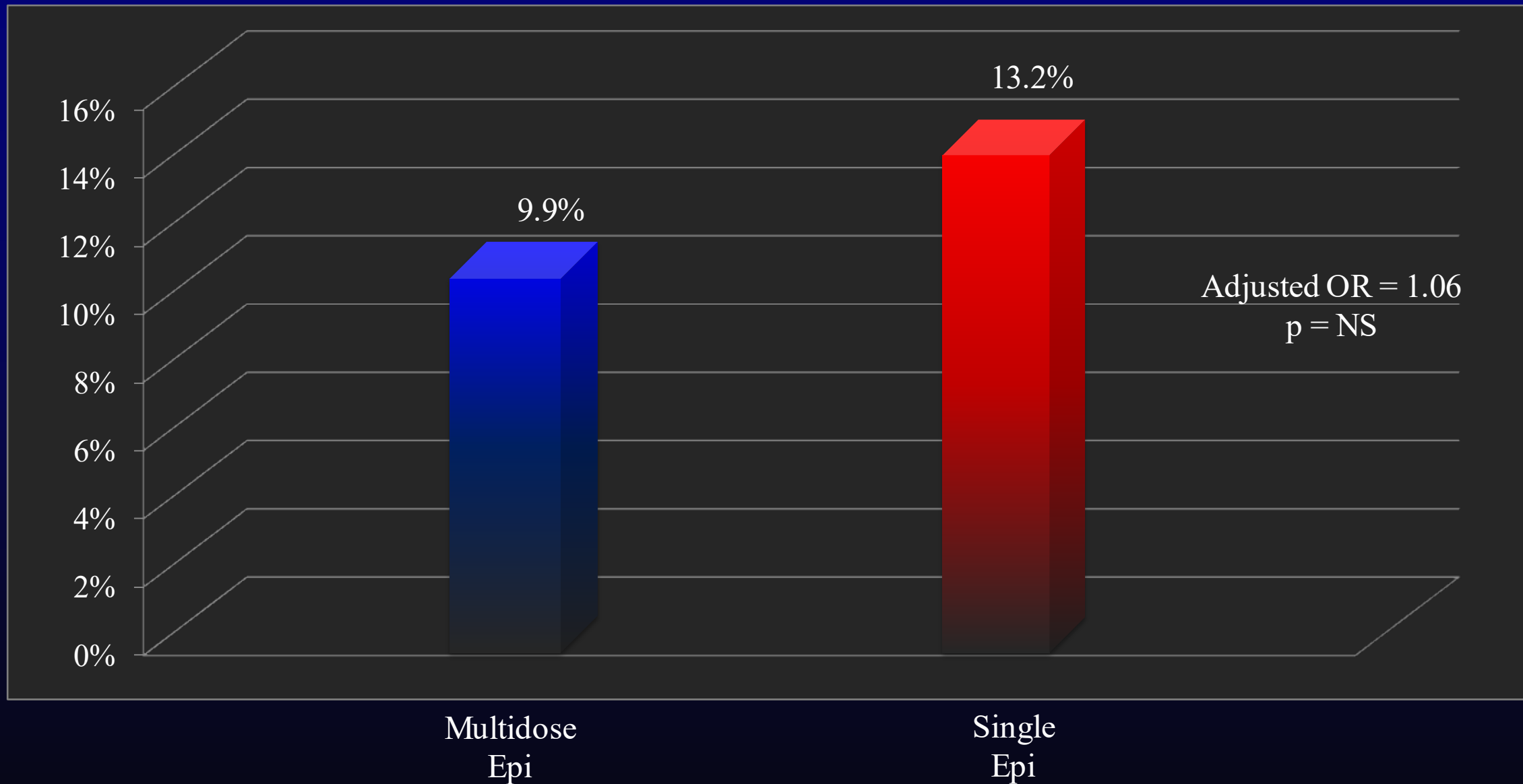
ROSC

Prehosp Emerg Care 2022; online Sept 30



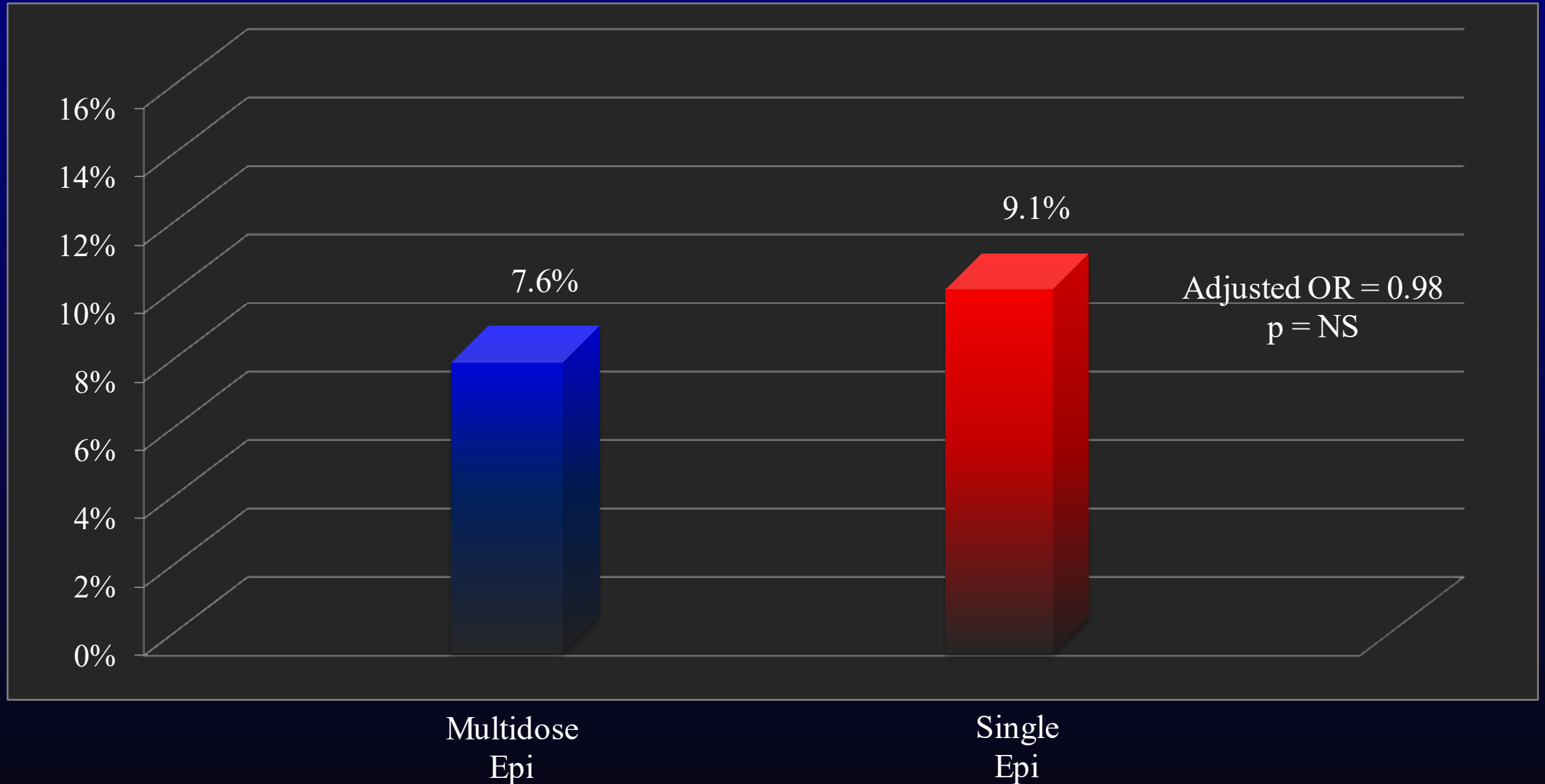
Survival to Hospital Discharge

Prehosp Emerg Care 2022; online Sept 30



Favorable Neurologic Outcome

Prehosp Emerg Care 2022; online Sept 30



Single Dose Epinephrine in CPR

Take Homes

- More Epi during CPR equals More ROSC
- **But No Improvement in Neurologic Outcomes**
- We need to rethink Epinephrine Use and Dosing
- *Large Multicenter US Trial Urgently Needed*
- *No Epi vs a Single Epi dose vs Epi Q3-5 minutes*

Double Sequential Defibrillation (DSD)

Defibrillation Strategies for Refractory Ventricular Fibrillation

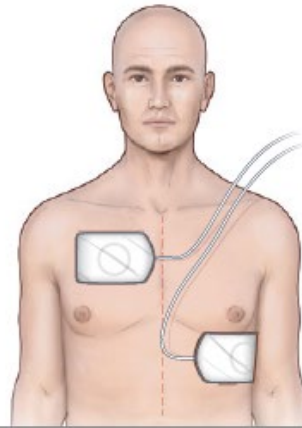
Sheldon Cheskes ¹, P Richard Verbeek ¹, Ian R Drennan ¹, Shelley L McLeod ¹, Linda Turner ¹, Ruxandra Pinto ¹, Michael Feldman ¹, Matthew Davis ¹, Christian Vaillancourt ¹, Laurie J Morrison ¹, Paul Dorian ¹, Damon C Scales ¹

New Engl J Med 2022; 387:1947-1956

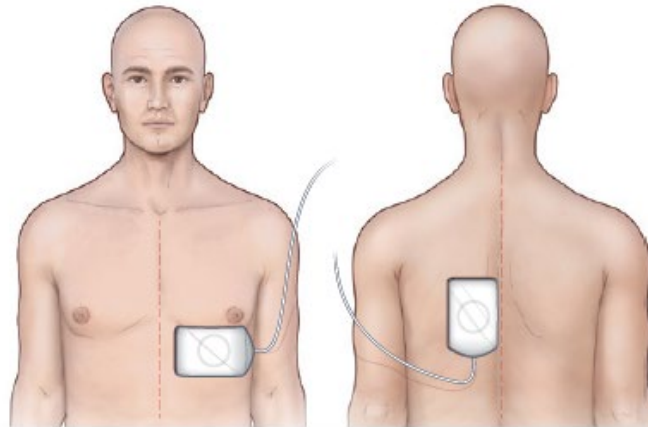
Does Double Sequential Defibrillation (DSD) improve VF termination compared to standard defibrillation?

- Compares DSD vs AL vs Switch to AP
- DSD and AP done s/p 3 unsuccessful AL shocks
- 405 patients from 6 Ontario Canada EMS Services
- Crossover design; services switched Q 6 months
- Evaluated VF termination, ROSC, Good Neuro at D/C

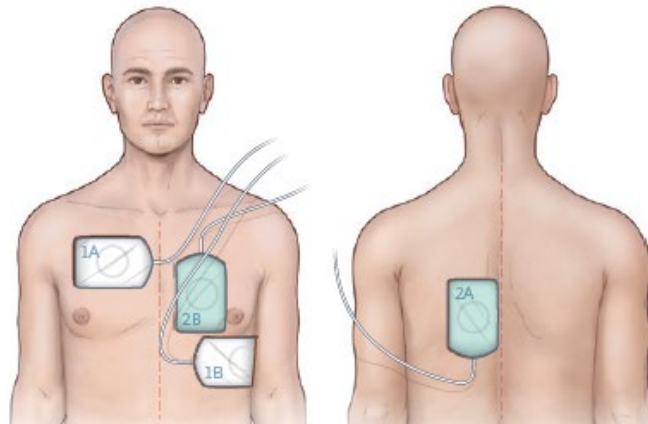
Standard Defibrillation



VC Defibrillation



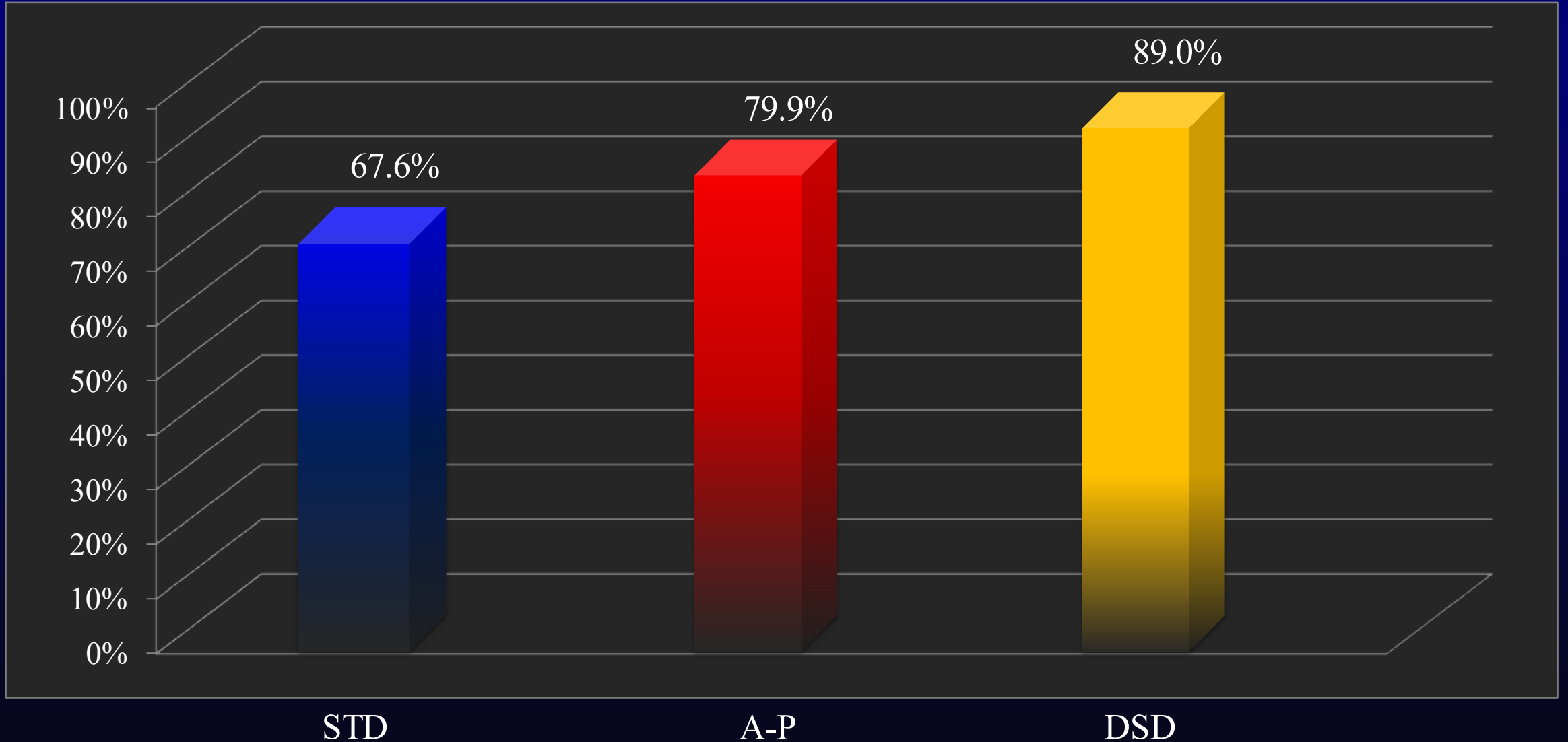
DSED



To avoid simultaneous firing of both defibrillators, a single paramedic discharged each defibrillator sequentially, with an approximate separation time of less than a second between the two shocks

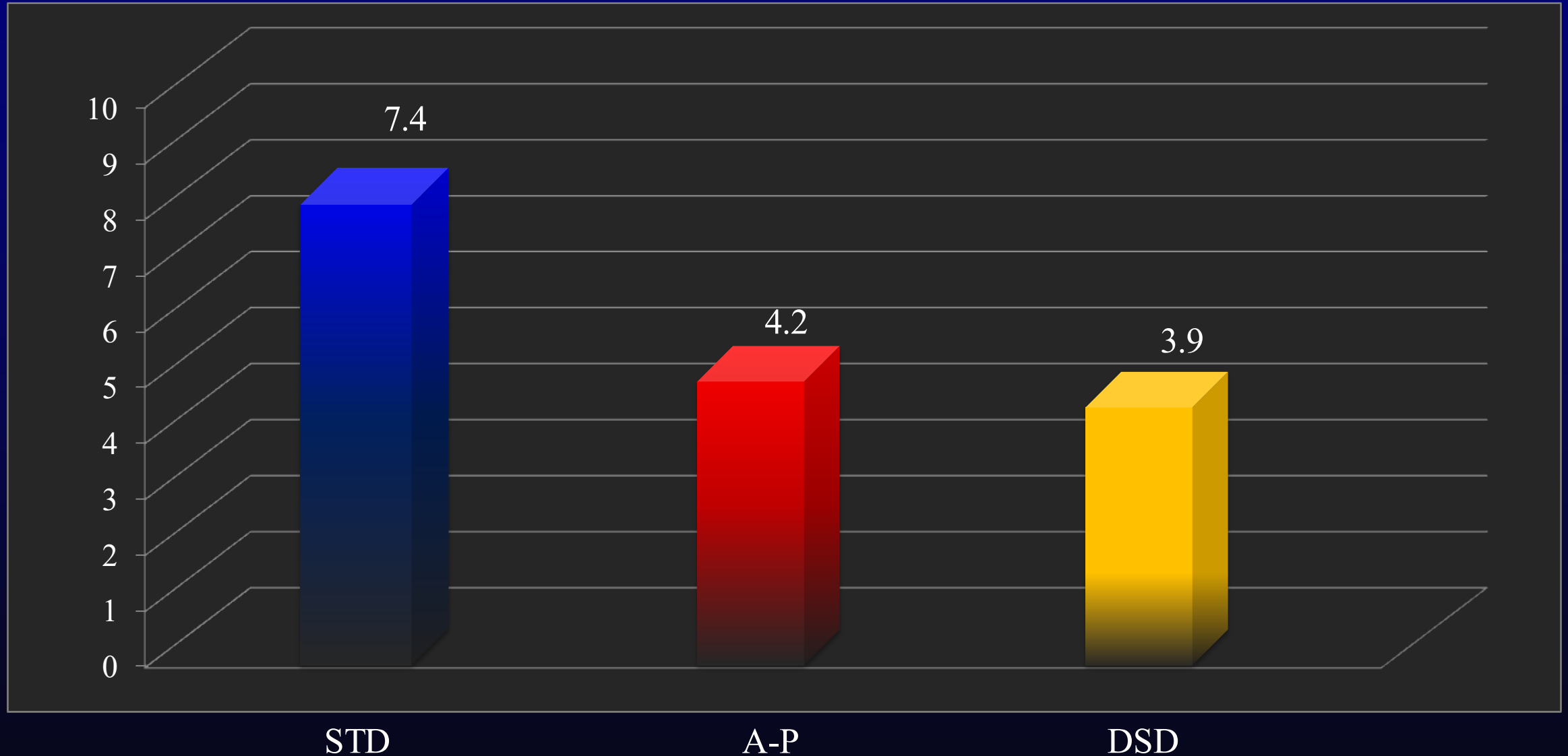
VF Termination

New Engl J Med 2022;387:1947-1956



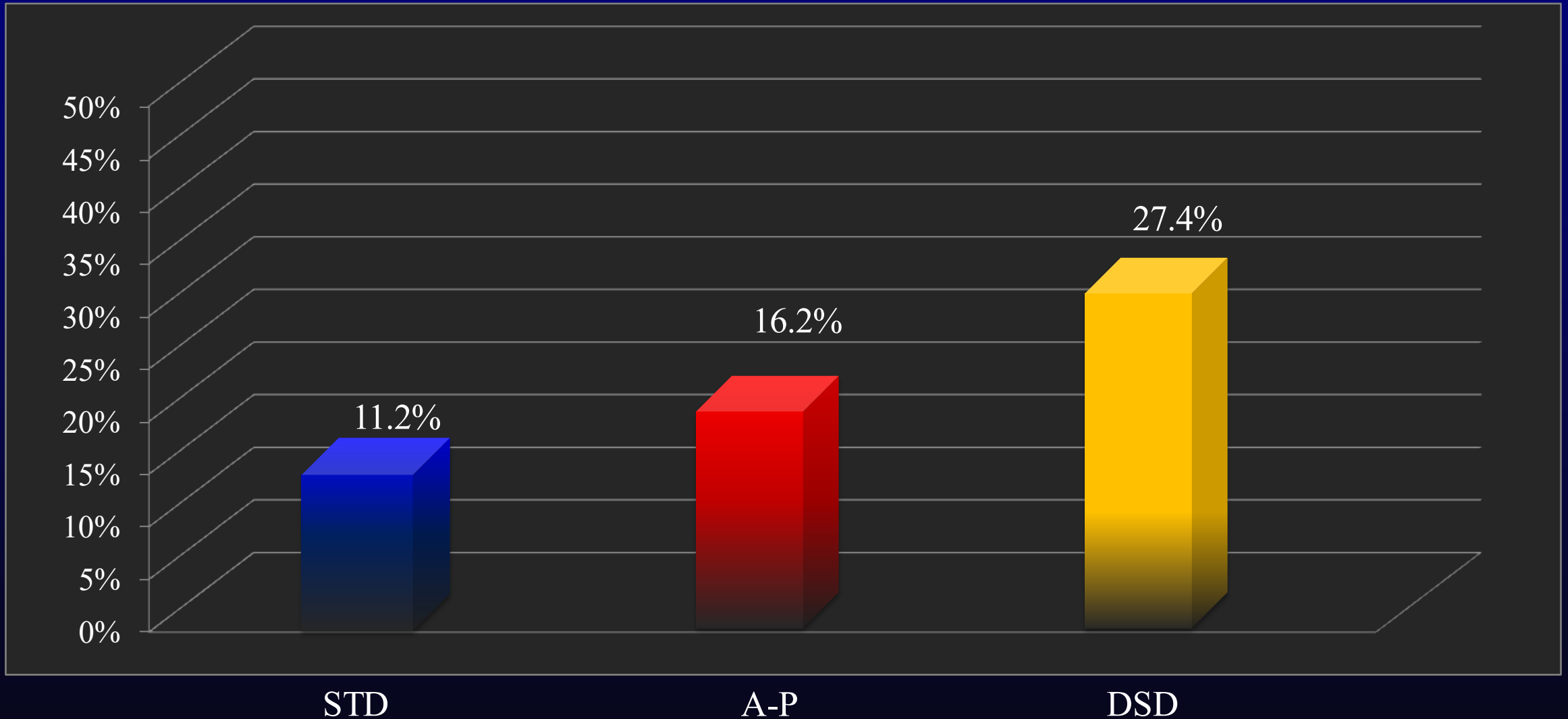
Median Number of Shocks for VF Termination

New Engl J Med 2022;387:1947-1956



MRs ≤ 2 at Discharge

New Engl J Med 2022;387:1947-1956



Survival to Hospital Discharge was more frequent with
DSD or to AP Vector Change
than standard repetitive Anterior Lateral Defibrillations

Survival to Hospital Discharge with Good Neurological Outcome was more frequent with DSD as compared to Vector Change to AP or standard repetitive Anterior Lateral Defibrillations

Always Switch from AL **to AP or to DSD**
after 2-3 unsuccessful Defibrillations

If You Want to Improve Survival In VF/pVT

- Early Shock
- Early Antiarrhythmics: Lidocaine *or* Amiodarone
- No repeat (or any) Epinephrine
- **Switch AL to AP or DSD after 2-3 shocks**
- Consider Beta Blockers

Transcutaneous Pacing

Anteroposterior pacer pad position is better than anterolateral for transcutaneous cardiac pacing

Siamak Moayedi ¹, Priya Patel ², Nicholas Brady ², Michael Witting ³, Timm-Michael L Dickfeld ⁴

Resuscitation 2022; 181:140-146

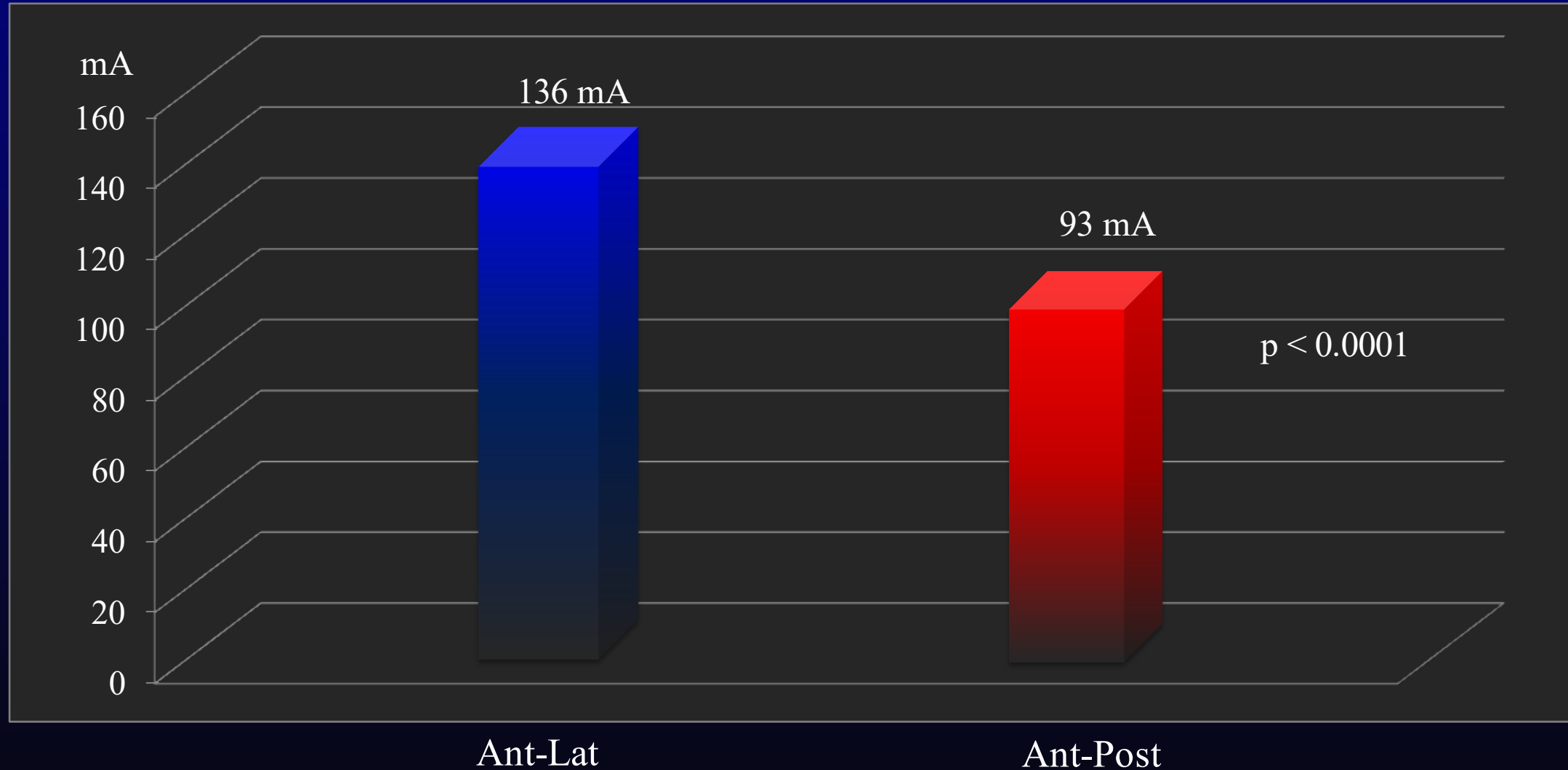
Is Anterior-Lateral or Anterior Posterior Pad Position Better for Transcutaneous Pacing

- 20 patients in a crossover trial; 13 completed the trial
- 4 did not capture in either AL or AP positions
- 3 patients could not complete study due to sedation issues
- 13 patients had AL vs AP pad positioning compared

This study compares the energy required to transcutaneous pace patients who had been recently electively cardioverted for Atrial Fibrillation with Ant-Lat pad position vs Ant-Post pad position

Mean Required Energy for Successful Pacing (in milliamps)

Resuscitation 2022;181: 141-146



The study also compared the severity of chest wall contractions.

Mean Contraction Severity was statistically less with AP vs AL
(3 vs 4: $p < 0.005$)

Use Anterior Posterior Pacer Pads... *they are superior to Anterior Lateral Placement and hurt less*

Nitroglycerin in AMI

Pain = Ischemia

Nitrates

- Decreases Preload
- Decreases Afterload
- Decreases O₂ Consumption
- Saves Myocardium
- *“May Decrease Mortality”* (not)

Acute Hypotension with NTG

5 Causes

- **Right Ventricular and Inferior AMIs**
- Relative or Absolute Volume Depletion
- Viagra, Levitra, Cialis
- Bezold-Jarisch Reflex
- Drug Sensitivity (valvular dx, idiopathic)

Adverse events from nitrate administration during right ventricular myocardial infarction: a systematic review and meta-analysis

Matt Wilkinson-Stokes ¹ ², Jason Betson ², Simon Sawyer ³

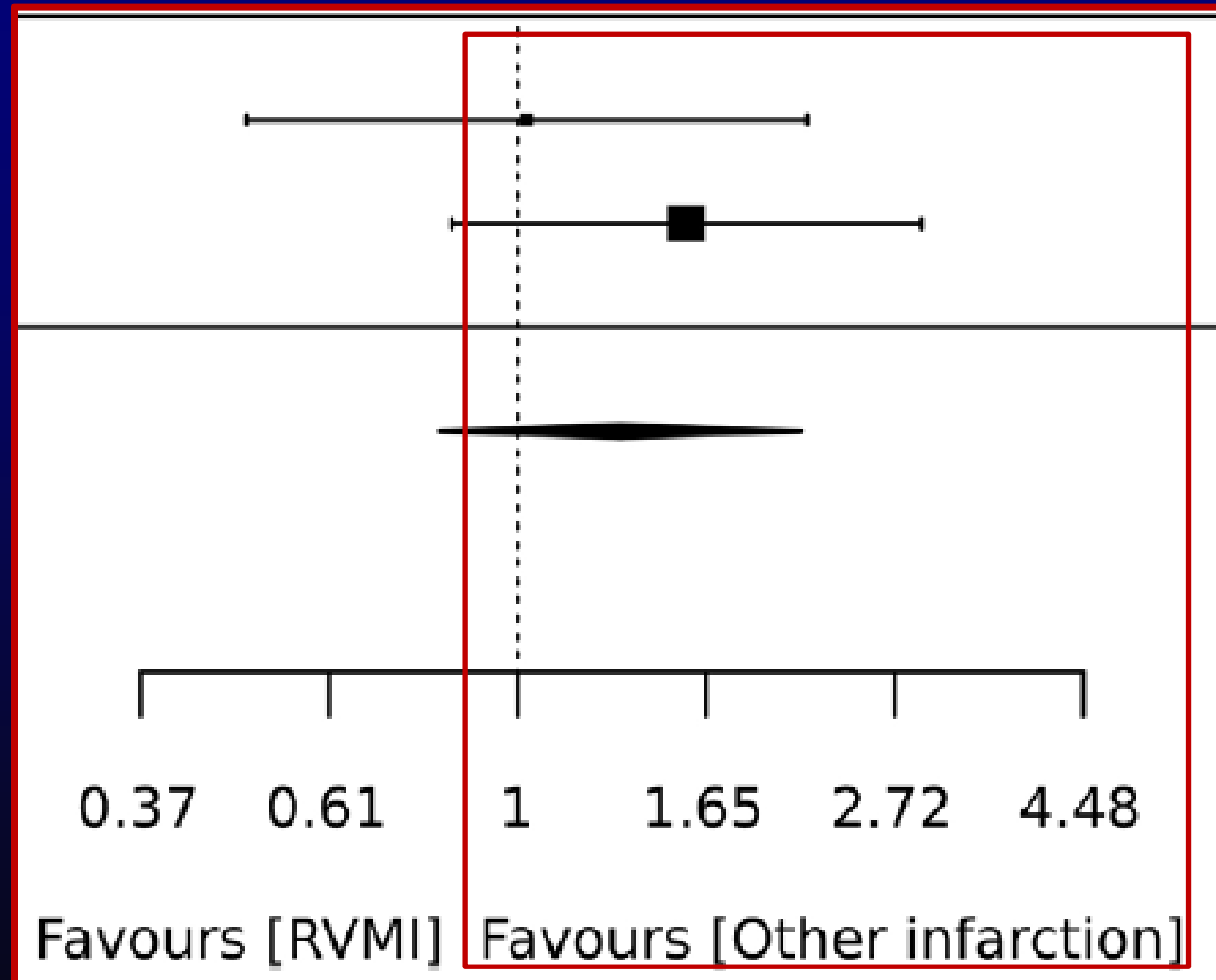
Emerg Med J 2023;40:108-113

Can SL Nitroglycerin be Safely Administered to Right Ventricular Myocardial Infarctions?

- 5 studies with 1113 patients; 1050 received 0.4 mgs SL (400 ugm)
- Compared complications in RV AMI pts vs other AMIs
- All RV (145) infarct patients had Inferior AMI also

Complications After SL NTG

Emerg Med J 2023;40:108-113



Metanalysis of SL NTG Risk in AMI

Emerg Med J 2023;40:108-113

Anticipated absolute effects

Risk during other
infarctions

9 per 100

Risk difference during
RVMI

3 more per 100 (2 fewer to
10 more)

Sublingual NTG in Inferior and RV Infacts

Take Homes

- SL Nitroglycerin is safe in Inferior AMIs
- SL Nitroglycerin is safe even if concomitant RV AMI
- Older teachings on SL NTG in AMI *are not true*
- *Beware Borderline BPs in any AMI*
- Especially if *Tachycardiac*
- Follow BP and Pulse carefully when using NTG

Optimal Systolic BP
in TBI Patients

Optimal Out-of-Hospital Blood Pressure in Major Traumatic Brain Injury: A Challenge to the Current Understanding of Hypotension

Daniel W Spaite¹, Chengcheng Hu², Bentley J Bobrow³, Bruce Barnhart⁴, Vatsal Chikani⁵, Joshua B Gaither⁶, Kurt R Denninghoff⁶, Gail H Bradley⁷, Amber D Rice⁶, Jeffrey T Howard⁸, Samuel M Keim⁶

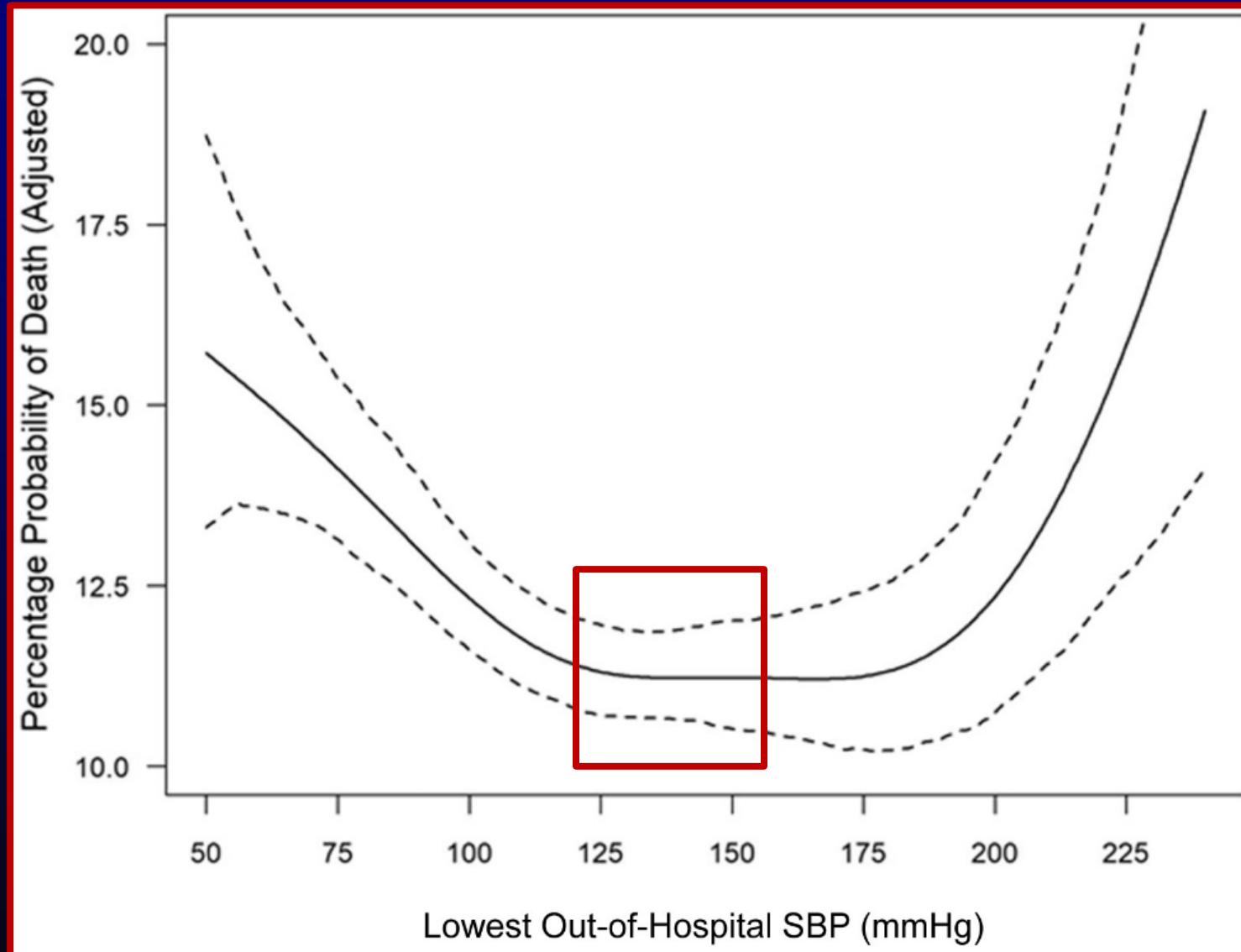
Ann Emerg Med 2022;80:46-54

What Systolic BP (SBP) is optimal for survival after Major Traumatic Brain Injury?

- 12,169 Major Traumatic Brain Injury patients
- Mortality compared to lowest EMS SBP
- All patients 10 years old and greater
- Both Isolated TBI and Multisystem Trauma TBI pts
- Arizona State Trauma Registry

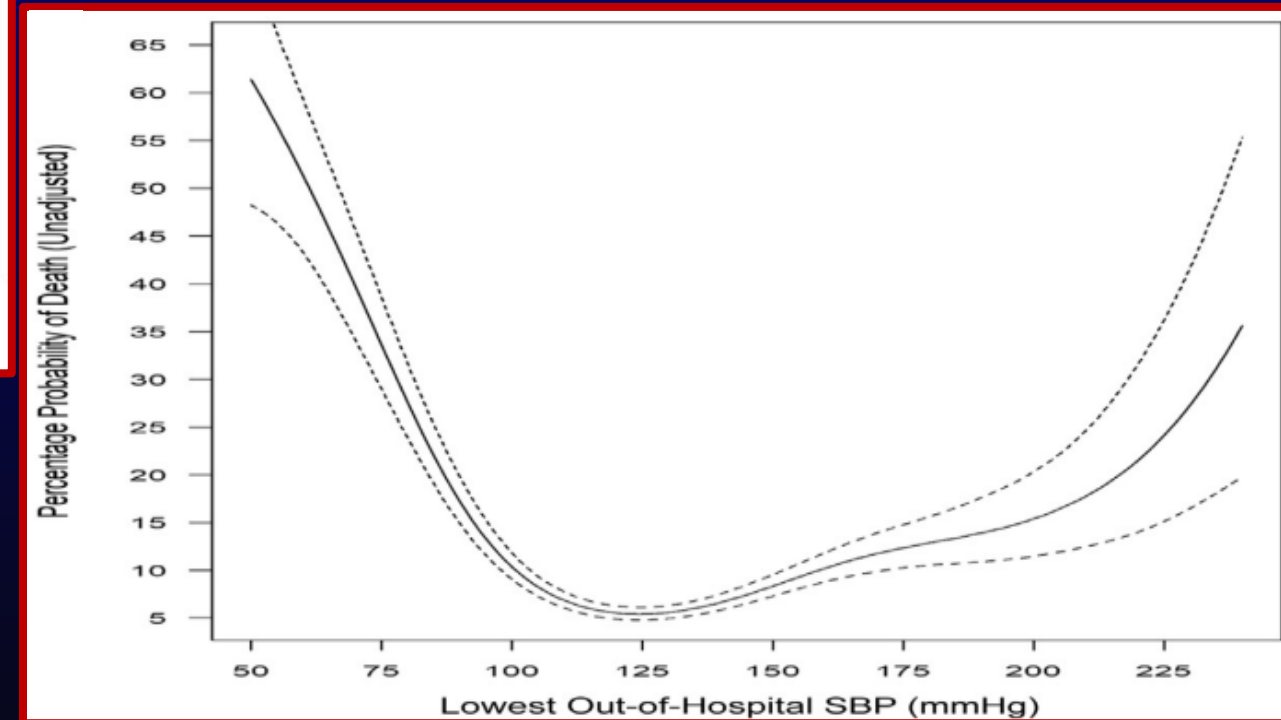
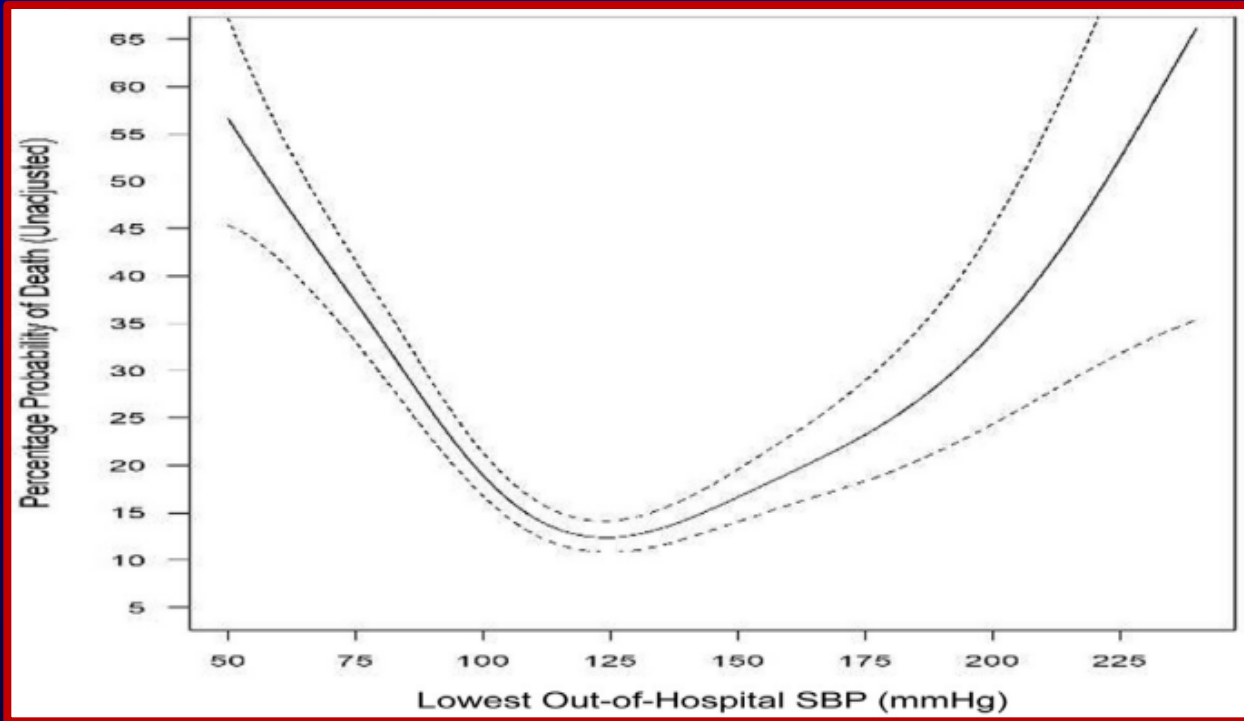
Probability of Death vs SBP

Adjusted Mortality



Probability of Death vs SBP

Multisystem vs Isolated TBI



Mortality increases by 19% for every 10 mm Hg decrease in SBP below 120 mm Hg

Mortality is minimized if SBP is between
130 mm Hg and 180 mm Hg

Systolic Blood Pressure in Major TBI

Take Home

Definition of Hypotension (<90 mm Hg) in TBI is outdated

SBP of at least 120-130 should be our new target in TBI

Summary and Conclusions

Summary

Only 1 Dose of Epi?

Final word on DSD vs AP is not yet in

Switch from AL pads after 2-3 shocks

NTG is safe in Inferior and RV AMIs

Higher Systolic BPs in TBI

SECURE THE ABC'S

