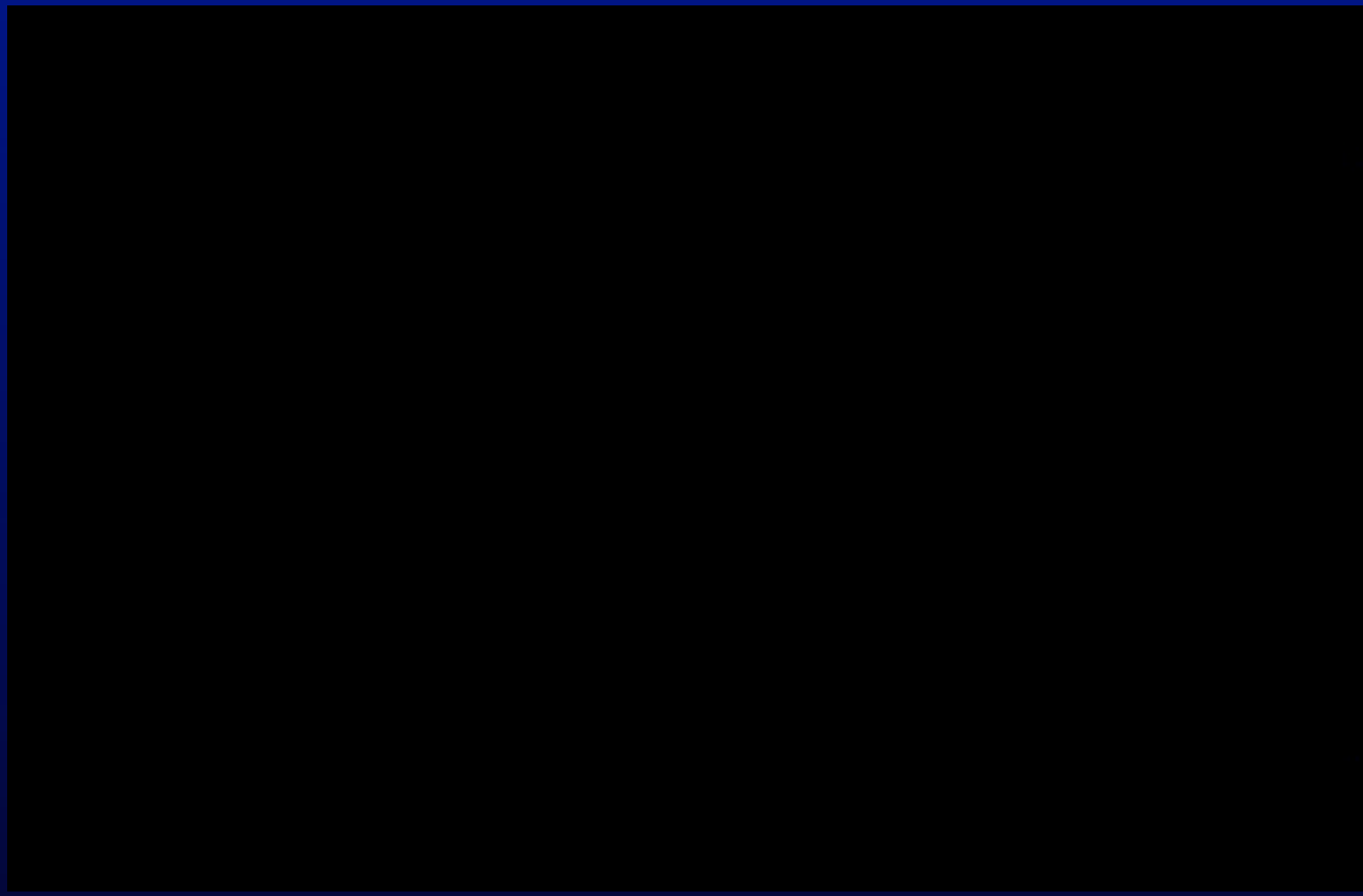
5 Key EMS Articles for 2012

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



5 Key Topics

- Cardiac Arrest
- Trauma Arrests
- IO Placement
- Tourniquets
- Seizure Management

Atropine Sulfate for Patients With Out-of-Hospital Cardiac Arrest due to Asystole and Pulseless Electrical Activity

The Survey of Survivors After Out-of-hospital Cardiac Arrest in KANTO Area, Japan (SOS-KANTO) Study Group

Background: The 2005 guidelines for cardiopulmonary resuscitation (CPR) have recommended that administration of atropine can be considered for non-shockable rhythm, but there are insufficient data in humans.

Circ J 2011;75:580-588

- 7,448 AS and PEA arrest pts
- Epi + Atropine vs. Epi alone Q 3 min
- Atropine use increased ROC in AS
- **Atropine of no long term benefit in AS**
- **Atropine decreased long term PEA survival 3.2% vs. 7.1% (1.02% vs 0.59%)**

Clinical paper

Effect of adrenaline on survival in out-of-hospital cardiac arrest: A randomised double-blind placebo-controlled trial☆

Ian G. Jacobs[a,c,*], Judith C. Finn[a,c], George A. Jelinek[b], Harry F. Oxer[c], Peter L. Thompson[d,e]

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Resuscitation 2011;82:1138-1143

- Does epinephrine improve survival
- Double blind placebo controlled
- 534 patients
- Western Australia
- Evaluated ROSC and Discharge

Clinical paper

Effect of adrenaline on survival in out-of-hospital cardiac arrest: A randomised double-blind placebo-controlled trial☆

Ian G. Jacobs[a,c,*], Judith C. Finn[a,c], George A. Jelinek[b], Harry F. Oxer[c], Peter L. Thompson[d,e]

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Resuscitation 2011;82:1138-1143

- Good Neuro Outcomes in 14/16 Discharged
- Epi ↑ ROSC 2x for non shockable rhythm
- Epi more than doubled survival to discharge
- Not a large definitive study
- Atropine out, Epi Stays

The Consequences of Noncompliance With Guidelines for Withholding or Terminating Resuscitation in Traumatic Cardiac Arrest Patients

Nathan M. Mollberg, DO, Stephen R. Wise, MD, Kevin Berman, MD, Saeed Chowdhry, MD, Michelle Holevar, MD, Ryan Sullivan, MD, and Amir Vafa, MD

J Trauma 2011;71:1997-1002

- 294 Trauma Arrests over 8 years
- Mount Sinai, Chicago
- Evaluated Survival
- Evaluated Costs
- Should we adhere to TOR protocols?

Traumatic Cardiac Arrests NAEMSP/ACS-COT Guidelines

- Withhold in Blunt Trauma if:
  - Apneic, Pulseless, Asystolic or PEA
- Withhold care in Penetrating if apneic, pulseless, asystolic, and no signs of life
- Do not transport if > 15 min of unsuccessful CPR
- Transport penetrating trauma if organized ECG activity (PEA > 40) +/or signs of life, including pupils

The Consequences of Noncompliance With Guidelines for Withholding or Terminating Resuscitation in Traumatic Cardiac Arrest Patients

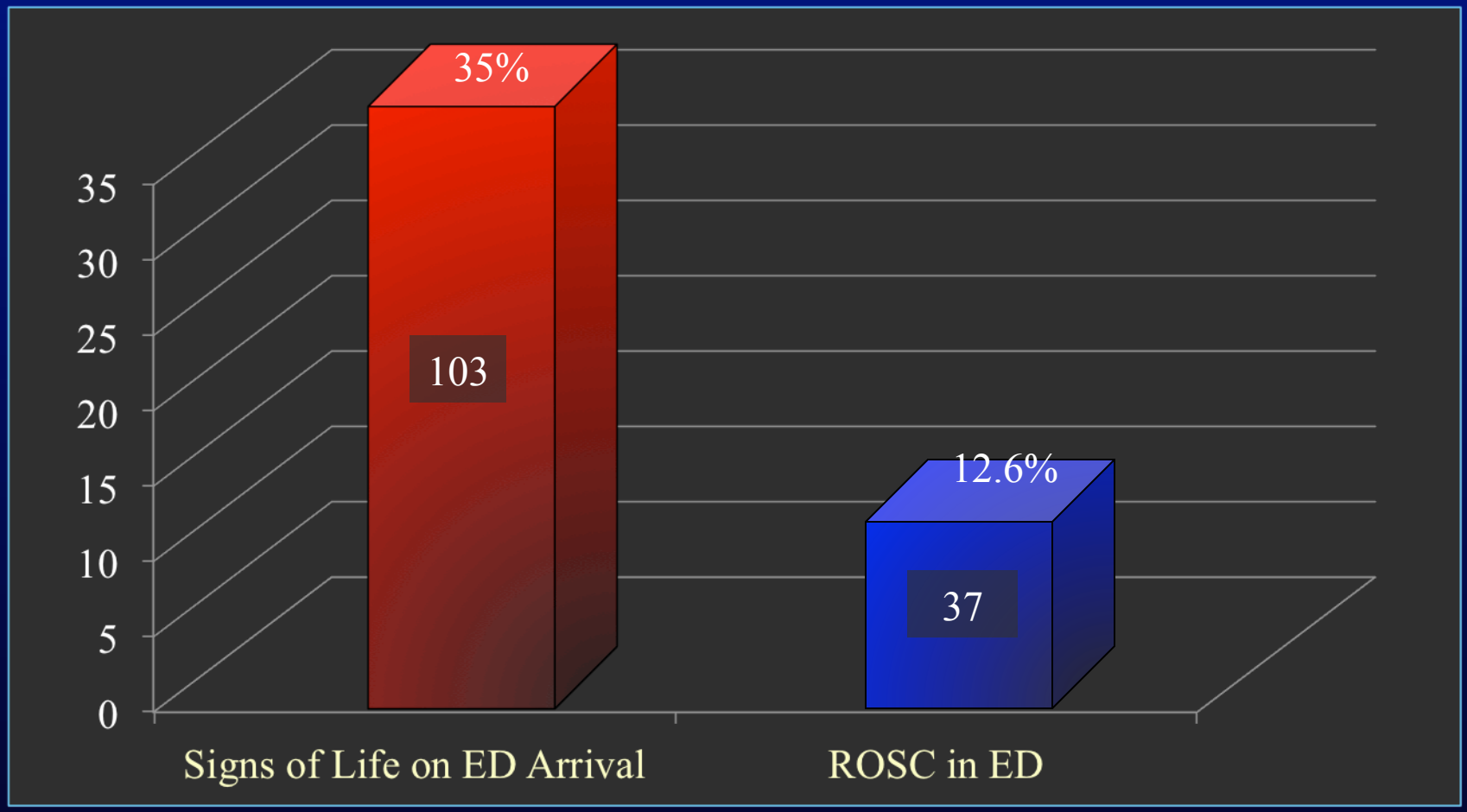
J Trauma 2011;71:1997-1002

Results

294 patients met TOR criteria, but were transported.

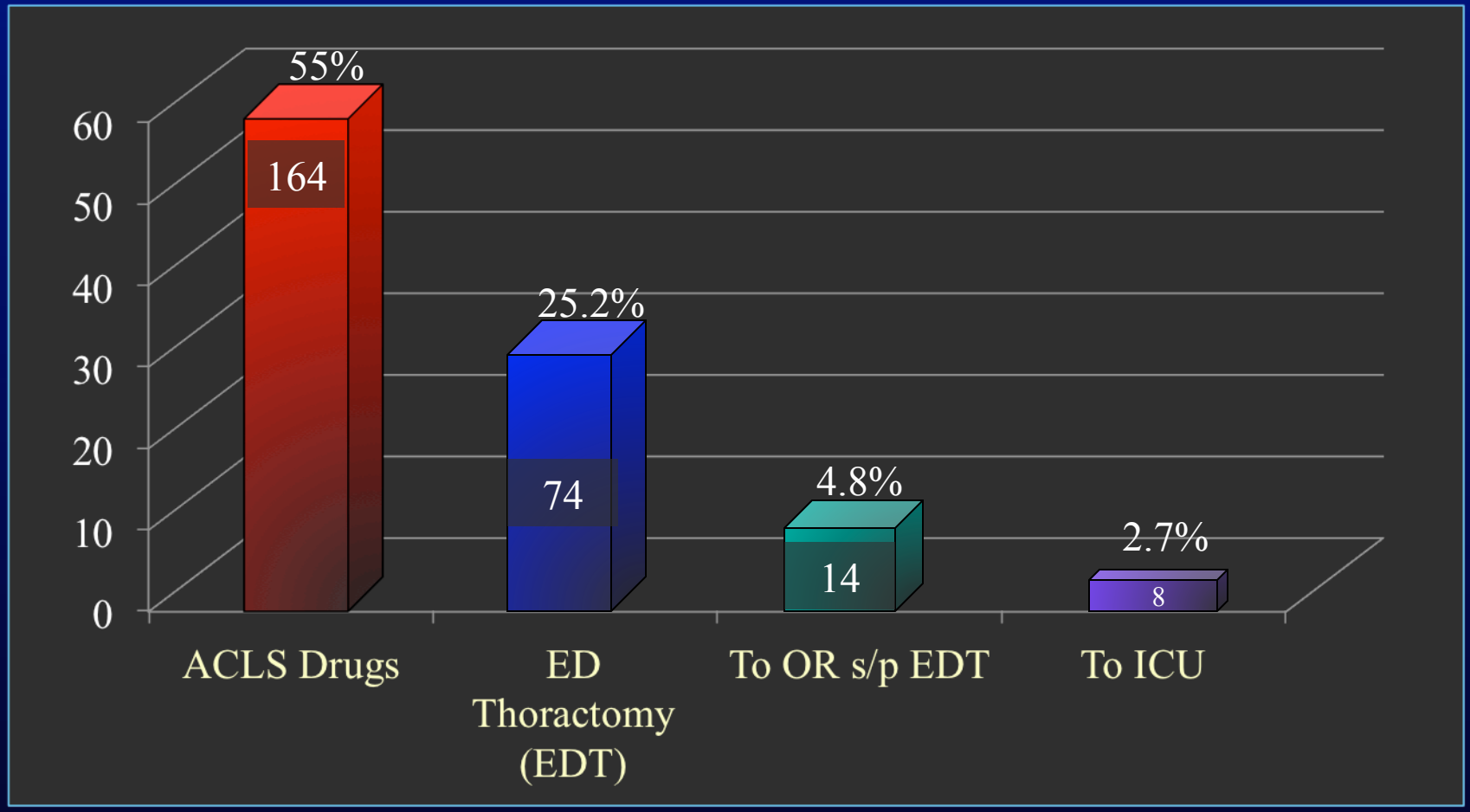
ED and ROSC

J Trauma 2011;71:1997-1002



Short Term Survival

J Trauma 2011;71:1997-1002



Overall Survival of 294 Patients

- 8 patients to ICU s/p OR
- 4 declared brain dead
- 2 died within 24 hrs
- 1 had care withdrawn
- No organ donors

1/294 Survival (0.3%)
GCS of 6 to long-term care

Charges for Trying to Save Victims Who Qualify for TOR

- $8,424 – pronounced in ED
- $43,080 - if admitted to OR or ICU

Terminate Trauma Arrests unless VF or Penetrating PEA with pulse > 40 and/or ROSC.

CARDIOLOGY/ORIGINAL RESEARCH

Intraosseous Versus Intravenous Vascular Access During Out-of-Hospital Cardiac Arrest: A Randomized Controlled Trial

Rosalyn Reades, MD, Jonathan R. Studnek, PhD, NREMT-P, Steven Vandeventer, EMT-P, John Garrett, MD

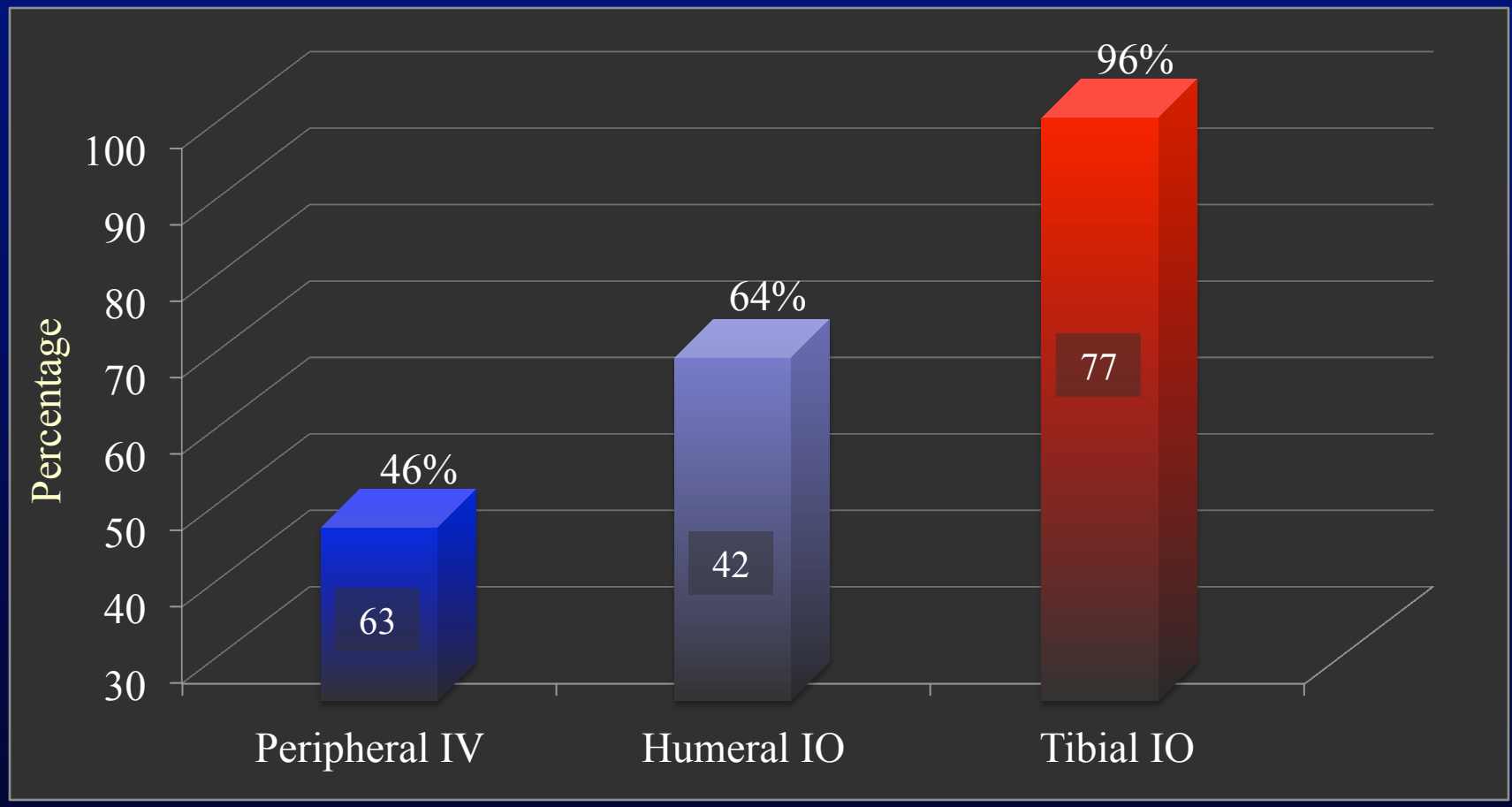
From the Methodist Hospital System, Dallas, TX (Reades); Carolinas Medical Center and the Center for Prehospital Medicine, Charlotte, NC (Studnek); Mecklenburg EMS Agency, Charlotte, NC (Studnek, Vandeventer); and the Baylor Healthcare Systems, Department of Emergency Medicine, Baylor University Medical Center, Dallas, TX (Garrett).

Ann Emerg Med 2011;58:509-516

- Is IV or IO faster in arrest
- Randomized trial, 182 pts, 113 paramedics
- IV vs. Tibial IO vs. Humeral
- Mecklenburg EMS, Carolinas Hospital

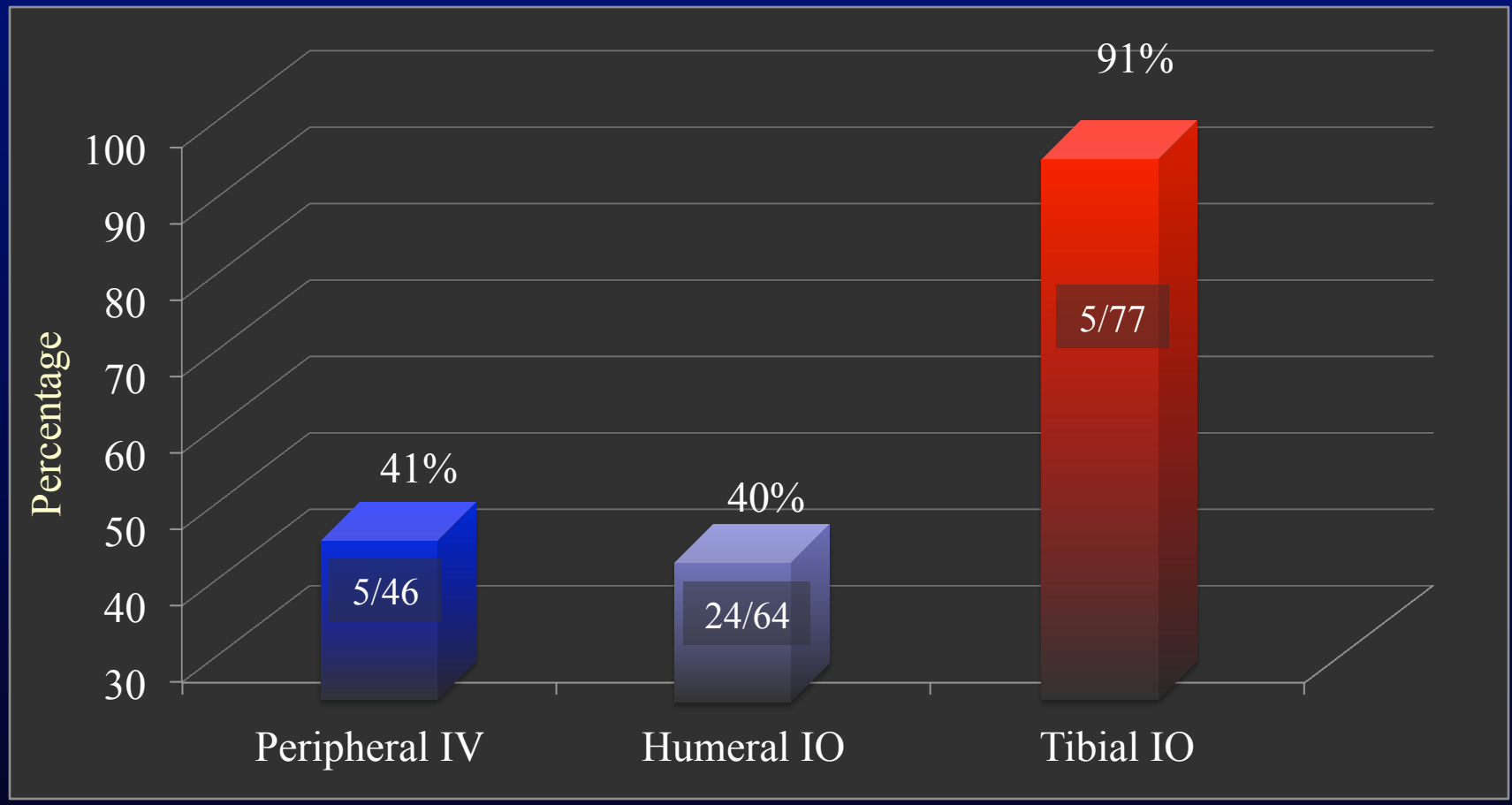
First Attempt Success Rates

Ann Emerg Med 2011;58:509-516



Overall Success Rate After Displacements

Ann Emerg Med 2011;58:509-516



IO vs. IV in CPR
Take Homes

- Tibial IOs seem best for rapid access
- Humeral IOs often displaced
- Paramedics more comfortable doing Tibial IO
- 2x volume via IV vs. IO
- No survival analysis performed

IOs should also be used in-hospital
if IV not easy or quick.

BATTLE CASUALTY SURVIVAL WITH EMERGENCY TOURNIQUET USE TO STOP LIMB BLEEDING

John F. Kragh, Jr, COL, MC, USA,* Michelle L. Littrel, CPT, AN, USA,† John A. Jones,* Thomas J. Walters, PHD,* David G. Baer, PHD,* Charles E. Wade, PHD,* and John B. Holcomb, MD*†

*US Army Institute of Surgical Research (USAISR), Fort Sam Houston, Texas and †Department of Nursing, Brooke Army Medical Center, Fort Sam Houston, Texas

Reprint Address: John F. Kragh, Jr, COL, MC, USA, Bone and Soft Tissue Trauma Research Program, US Army Institute of Surgical Research, 3400 Rawley E. Chambers Ave., Bldg. 3611, Room L82-16, Fort Sam Houston, TX 78234-6315

J Emerg Med 2011;41:590-597

- 499 patients
- 862 tourniquets on 651 limbs
- 635/651 appropriately applied or used
- Evaluated survival benefits

BATTLE CASUALTY SURVIVAL WITH EMERGENCY TOURNIQUET USE TO STOP LIMB BLEEDING

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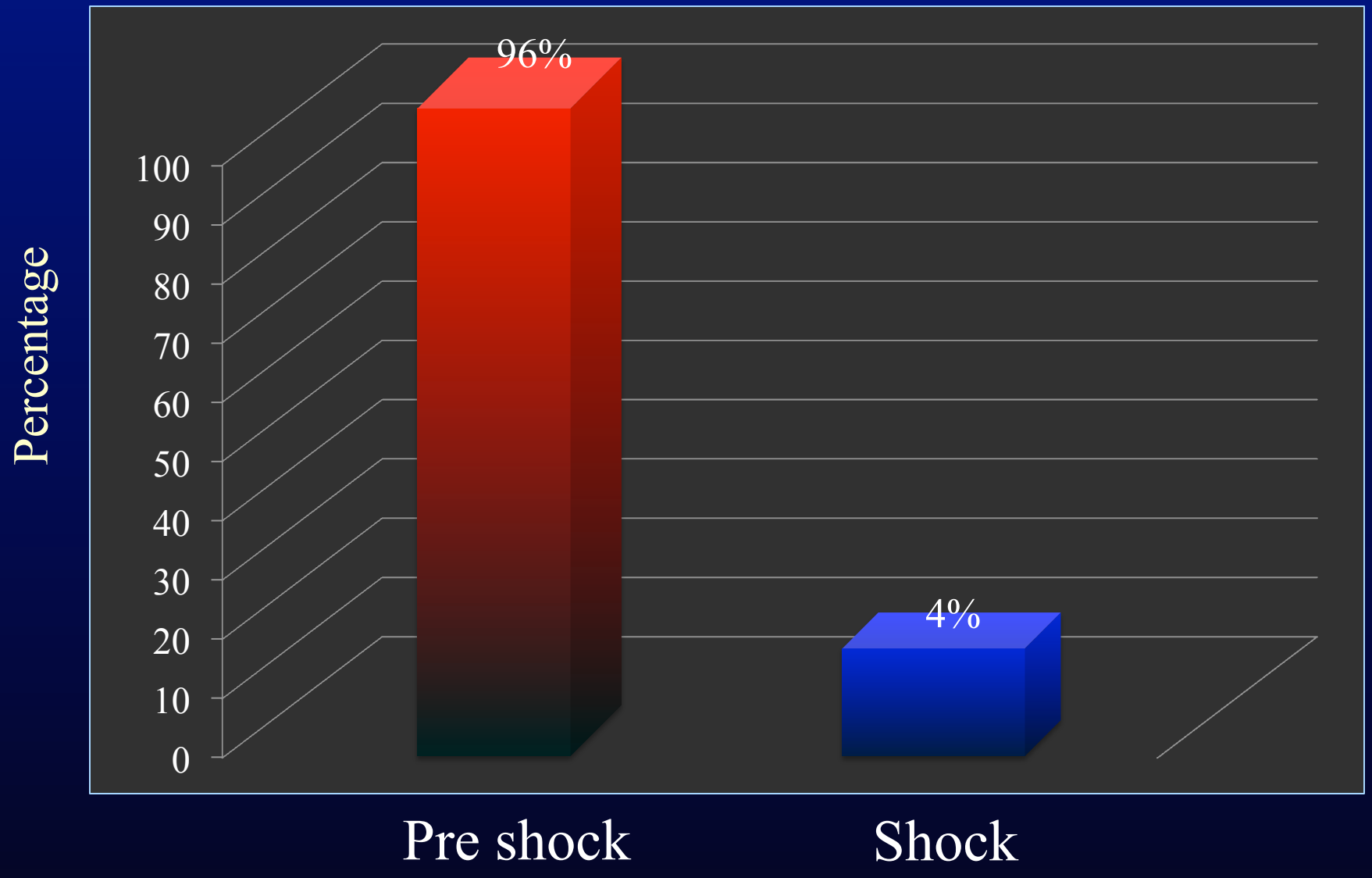
J Emerg Med 2011;41:590-597

Effectiveness of Tourniquets

- Survival was 87%
- 1.6% rate for nerve palsies
- 1.7% first 6 months, 1.5% next 6 months
- 0.4% major limb shortening

Survival Before vs. After Shock



Take Homes
Tourniquet vs. No Tourniquet

- 9% death rate seen in Vietnam in patients with isolated limb exsanguination

vs

- 2% in patients if tourniquets used during Iraq

- Need to know how to apply and monitor
- Cheap and effective if used appropriately

Intramuscular versus Intravenous Therapy for Prehospital Status Epilepticus

Robert Silbergleit, M.D., Valerie Durkalski, Ph.D., Daniel Lowenstein, M.D., Robin Conwit, M.D., Arthur Pancioli, M.D., Yuko Palesch, Ph.D., and William Barsan, M.D., for the NETT Investigators*

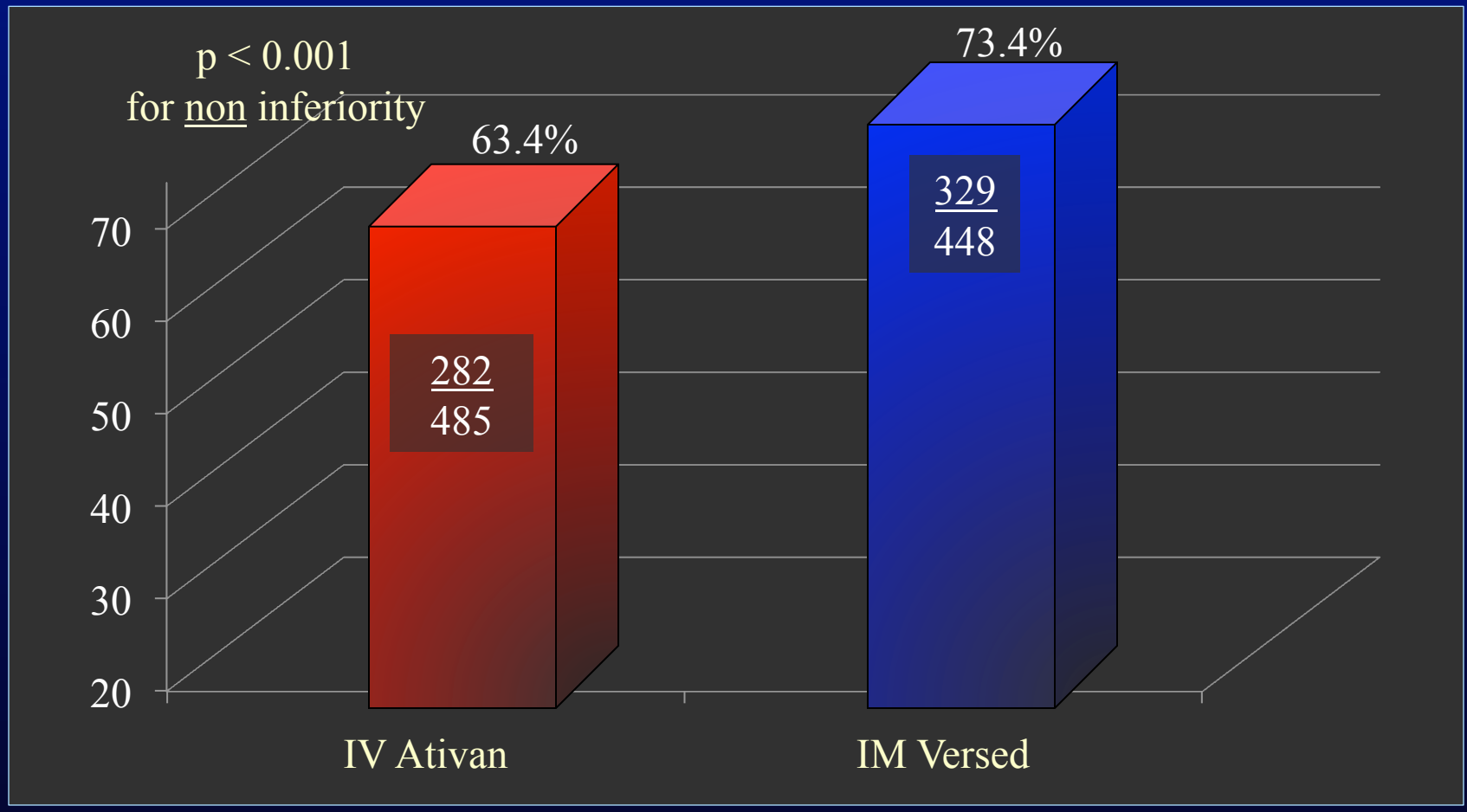
ABSTRACT

NEJM 2012;366:591-600

- 893 prehospital seizing children and adults
- IM Midazolam vs. IV Lorazepam
- Is either more effective?
- Also evaluated complications
- Double Blind, Randomized, Non-inferiority

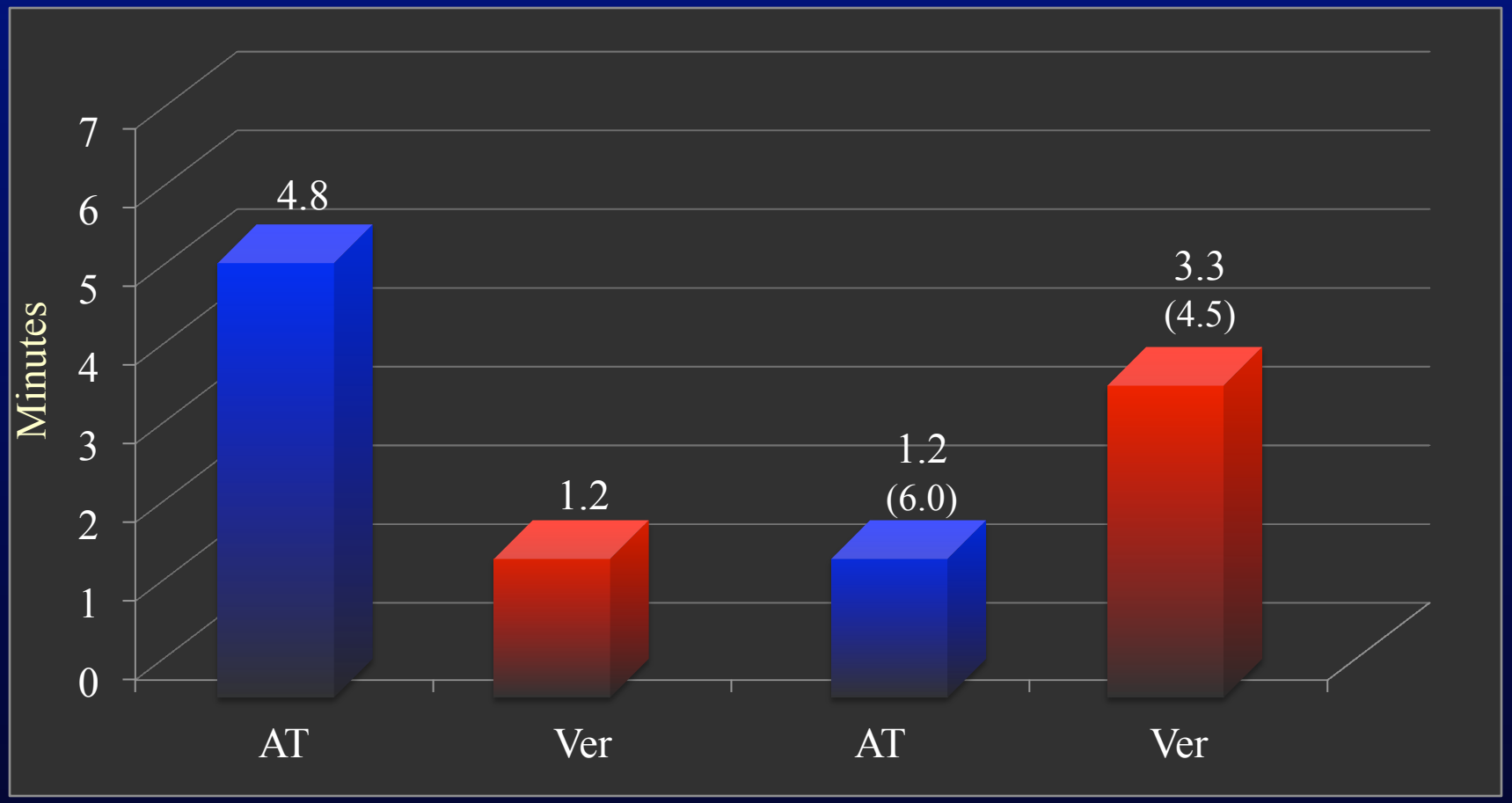
Seizures Stopped by ED Arrival

NEJM 2012;366:591-600



Time to Treat and Stop Seizure

NEJM 2012;366:591-600



Time to Treat

Time to Stop

Intramuscular versus Intravenous Therapy for Prehospital Status Epilepticus

Robert Silbergleit, M.D., Valerie Durkalski, Ph.D., Daniel Lowenstein, M.D., Robin Conwit, M.D.,

NEJM 2012;366:591-600

Results

- Similar times to stop seizures
  (Ativan: 6 min vs. Versed: 5 min; p = NS)
- Need for intubation the same
- Recurrent seizures the same
- Less hospital admissions with IM Versed
  (57.6% vs. 65.6%; p = 0.01)

Take Home Points
IV vs. IM Seizure Therapy

- IM versed is superior to IV Ativan
- No increased complications
- Less hospital admissions
- Easier and no IV required

Immediate Percutaneous Coronary Intervention Is Associated With Better Survival After Out-of-Hospital Cardiac Arrest

Insights From the PROCAT (Parisian Region Out of Hospital Cardiac Arrest) Registry

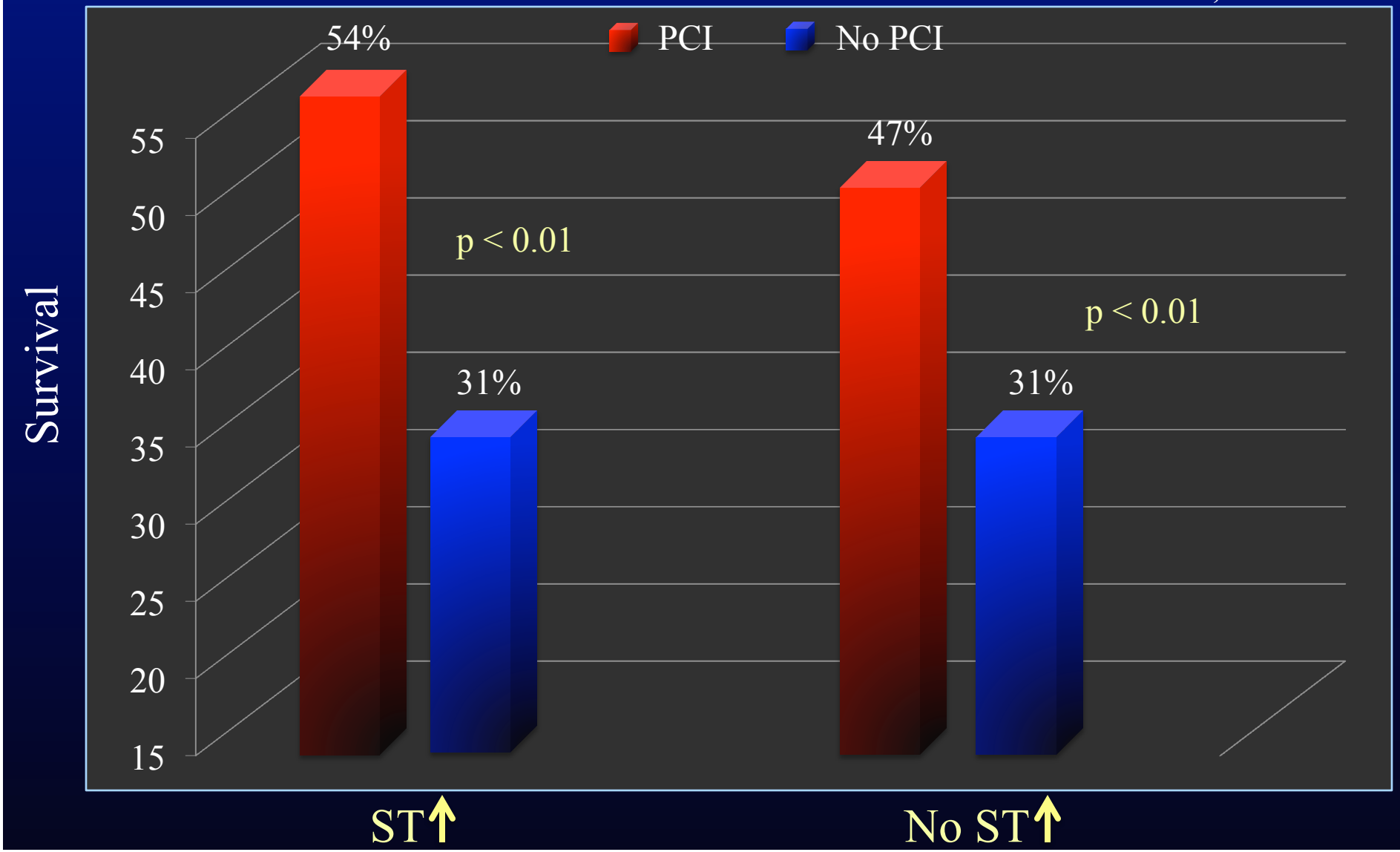
Florence Dumas, MD; Alain Cariou, MD; Stéphane Manzo-Silberman, MD; David Grimaldi, MD; Benoît Vivien, MD; Julien Rosencher, MD; Jean-Philippe Empana, MD; Pierre Carli, MD; Jean-Paul Mira, MD; Xavier Jouven, MD; Christian Spaulding, MD

Cardiovasc Interv 2010;3:200-207

- 714 cardiac arrest patients with ROSC
- 435 underwent immediate PCI
- 96% with ST↑ had acute coronary lesion
- 58% (176/301) with no ST↑ had acute lesion
- PCI s/p arrest ↑ survival (OR = 2.06)

Immediate PCI s/p Arrest – Survival Benefits

Cardiovasc Interv 2010;3:200-207



2011-2012 Management of VF/VT Survivors

S/P VF/VT awake → PCI

S/P VF/VT coma → PCI + TH

Conclusions

- No Atropine for AS or PEA
- Pronounce Trauma Arrests
- Use Tibial, not Humeral IOs
- Tourniquets Work
- IM Versed superior to IV Ativan (or IV Valium or IV Versed)

Conclusions

No Atropine for AS or PEA

Pronounce Trauma Arrests

Use Tibial, not Humeral IOs

Tourniquets Work

Say “Yes” to TH + PCI