5 Key EMS Articles for 2012

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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 is insufﬁcient data in humans.

- 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%)

*Circ J 2011;75:580-588*
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, Judith C. Finn, George A. Jelinek, Harry F. Oxer, Peter L. Thompson

1 Discipline of Emergency Medicine (M516), University of Western Australia, 35 Stirling Highway, Crawley, 6009 Western Australia, Australia

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

• 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

Results

294 patients met TOR criteria, but were transported.
ED and ROSC

J Trauma 2011;71:1997-1002

35%

103

12.6%

37

Signs of Life on ED Arrival

ROSC in ED
Short Term Survival

J Trauma 2011;71:1997-1002

- ACLS Drugs: 55% (164)
- ED Thoracotomy (EDT): 25.2% (74)
- To OR s/p EDT: 4.8% (14)
- To ICU: 2.7% (8)
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.
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

Percentage

Peripheral IV 63 46%
Humeral IO 42 64%
Tibial IO 77 96%
Overall Success Rate After Displacements

Ann Emerg Med 2011;58:509-516

- Peripheral IV: 41% (5/46)
- Humeral IO: 40% (24/64)
- Tibial IO: 91% (5/77)

Percentage
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.
• 499 patients

• 862 tourniquets on 651 limbs

• 635/651 appropriately applied or used

• Evaluated survival benefits
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

Percentage

Pre shock  Shock

96%  4%
### Take Homes

#### Tourniquet vs. No Tourniquet

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<tr>
<th><strong>9% death rate seen in Vietnam in patients with isolated limb exsanguination</strong></th>
<th><strong>2% in patients if tourniquets used during Iraq</strong></th>
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- 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

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

NEJM 2012;366:591-600
Seizures Stopped by ED Arrival

p < 0.001 for non inferiority

IV Ativan: 63.4% (282/485)
IM Versed: 73.4% (329/448)

NEJM 2012;366:591-600
Time to Treat and Stop Seizure

**NEJM 2012;366:591-600**

- **Time to Treat**
  - AT: 4.8 minutes
  - Ver: 1.2 minutes

- **Time to Stop**
  - AT: 1.2 minutes (6.0 minutes)
  - Ver: 3.3 minutes (4.5 minutes)
Intramuscular versus Intravenous Therapy for Prehospital Status Epilepticus

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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

• 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

![Graph showing survival benefits of immediate PCI post arrest compared to no PCI. The graph indicates a statistically significant difference (p < 0.01) in survival rates between the two groups.](image-url)
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