

Squad Review

MCEMS

Fall/Winter 2012

Oxygenation and Airway Update

Bobby Dery MD

Colorado West Emergency Physicians,
St. Mary's Hospital and Medical Center,
Grand Junction, Colorado.

Medical Director, Mesa County EMS.
ems.mesacounty.us

Goals:

- 1) Brief review of State trauma destination guidelines, and how they relate to scene time and Trauma Alerts in MCEMS.
- 2) Review recent EMS literature about oxygen therapy in patients with possible COPD exacerbations.
- 3) Review recent EMS literature regarding intubation in patients with cardiac arrest.
- 4) Avoid putting you to sleep.

State Destination Guidelines:

- Guidelines have been nationally validated which identify high-risk EMS trauma patients with a likelihood for “badness”.
- The State of Colorado has adopted a version of these guidelines for all EMS systems in our State.
- See: www.cdphe.state.us/em/SEMTAC .
- The point: if an EMS patient meets any of these criteria, they should be taken to the appropriate level trauma center- bypassing lower-level Trauma Centers if necessary.
- MCEMS: Most patients who meet one of these criteria must be taken to the Level II Center (SMH); with a small proportion being allowed to go to the Level IV Center (CH).

MCEMS STATEMENT ON TRAUMA CARE/SCENE TIMES

See Trauma 5- "Adult Trauma Destination Guidelines" as warranted.

See Trauma 8- "Pediatric Trauma Destination Guidelines" as warranted.

See Trauma 13- "Hypovolemic Shock" as warranted.

See Trauma 16- "Spinal Immobilization Protocol" as warranted.

See Trauma 17- "Spinal Trauma" as warranted.

1. Trauma is a surgical disease.
2. Trauma patients need to be delivered to the ED as quickly and safely as possible.
3. Even with stable vital signs, patients with significant injuries do not receive "stabilization" in the field.
4. With major injuries or unstable VS, the very most you can do is buy minutes or seconds via aggressive ABCDE management **while enroute**.
5. **Scene time should be less than 10 minutes in any patient who meets any of the Adult or Pediatric Trauma Destination Guidelines criteria.**
6. The "**Stat Trauma**" Provider Impression (PI) must be one of your PI's for all trauma patients who meet any of the Adult or Pediatric Trauma Destination Guidelines criteria.
7. The four themes which MUST guide all trauma care are:
 - a. As brief a scene time as is safely possible- our standard is <10 minutes for all trauma patients.
 - b. Safe, rapid transport to an appropriate facility.
 - c. As much assessment, physical exam, bleeding control, vascular access, etc. as possible done ENROUTE.
 - d. Early notification to the ED of the impending arrival of any critical/unstable trauma patient.
8. There is medical literature which suggests that starting a pre-hospital IV on-scene in the severely injured trauma patient may actually increase their mortality- it uses up valuable seconds and minutes. Again- do everything enroute when possible.
9. YOU DO NOT HAVE TO NORMALIZE SBP TO 120mmHg. Use hemorrhage control and fluid boluses for a target SBP of **90mmHg** in adults, or age specific SBP in pediatrics.
 - a. In general a mentating patient with good radial pulses has an adequate SBP.
10. Be very aware of fluids and do not over resuscitate the stable patient.
11. Assessment and stabilization of the possible cervical spine fracture is of paramount importance in trauma patients → when in doubt, immobilize.

Benchmark Box:

Please see Trauma 1 for EMS System "best practice" benchmarks for Trauma Scene Times, Stat Trauma PI.

See Trauma 5- "Adult Trauma Destination Guidelines" as warranted.

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Destination Guidelines criteria.

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Trauma Alerts

MCEMS Trauma Alerts:

- I believe, and the current literature supports, that short EMS times in Trauma likely saves lives.
- EMS Scene Time of less than 10 minutes in ANY patient who meets any of the Adult or Pediatric Destination Guidelines is one of our system CQI/QA Benchmarks.
- I believe this is a logical CQI/QA measure of Quality:
 1. These State Guidelines identify high-risk patients;
 2. Any high-risk patient may be an “Unexpected Death”;
 3. ALL of these patients should have brief scene times.
- Now that our HP update is completed, I am going to begin to follow this 10 minute Benchmark closely.

Trauma Alert tab in High Plain's:

- This is one of 3 Alerts you can check on the Alerts Tab.
- It is to be checked for ANY patient who meets ANY of the State Trauma Destination Guidelines- whether that patient is "sick" or "not sick" while in your care.
- All of these patients should have a scene time of less than 10 minutes; or charting as to why this was not feasible.
- Our EMS "Trauma Alert" is VERY different than the hospitals Level I Trauma activation- totally different fish.
- *Not your job to call a Level I-* just give us a good report (VS, injuries, MOI) and we will take care of that.
- All Level I's are unstable. Most EMS Trauma Alerts will not be unstable.

Oxygen and COPD

October 2010, British Medical Journal, Austin et al:

"Effect of high flow oxygen on mortality in chronic obstructive pulmonary disease patients in prehospital setting: randomised controlled trial."

This is a PRACTICE CHANGING STUDY. We should ALL change the way we practice medicine based on this research.

October 2010, British Medical Journal, Austin et al:

"Effect of high flow oxygen on mortality in chronic obstructive pulmonary disease patients in prehospital setting: randomised controlled trial."

Objective:

- To compare standard high flow oxygen treatment with titrated oxygen treatment for patients with an acute exacerbation of chronic obstructive pulmonary disease in the prehospital setting.

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Design:

- Randomized, prospective study design. Australia.
- 405 EMS patients with presumed COPD flare by EMT. 214 with confirmed COPD as final diagnosis.
- All treated by EMS, transported, and admitted to hospital.
- "High Flow O₂" vs. "Titrated O₂" to keep SaO₂ 88-92% in prehospital setting.

October 2010, British Medical Journal, Austin et al:

A few EMS details:

- Adults 35 years and older, enrolled by EMS if:
 1. Chief complaint of “breathlessness”, AND
 2. History of COPD or emphysema; OR
 3. “Risk” of COPD-
 1. Appropriate acute symptoms; or
 2. Greater than 10 pack year history of smoking.

October 2010, British Medical Journal, Austin et al:

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Main Outcome Measure:

- Prehospital or in-hospital mortality.
- So, does titrating O₂ to a sat of no more than 92% change the rate of death in EMS patients thought to be having an acute COPD flare by EMS personnel?

October 2010, British Medical Journal, Austin et al:

Overall Mortality:

- 405 total EMS patients.
 - 226 → “high flow oxygen”
 - 179 → “titrated oxygen”
- “high flow oxygen” group: 9% mortality (21/226)
- “titrated oxygen” group: 4% mortality (7/179)

So, risk of death was more than doubled for those in the high-flow/NRB mask group for all comers.

October 2010, British Medical Journal, Austin et al:

COPD-only Mortality:

- 214/405 total EMS patients with confirmed COPD.
 - 117 → “high flow oxygen”
 - 97 → “titrated oxygen”
- “high flow oxygen” group: 9% mortality (11/117)
- “titrated oxygen” group: 2% mortality (2/97)

So, risk of death was more than quadrupled for those in the high-flow/NRB mask group in patients with a confirmed history of COPD.

The take-home points:

- Like most medications, oxygen has a dose; at least in presumed prehospital COPD exacerbations.
- “Too much” oxygen is worse than “just right”; at least in presumed prehospital COPD exacerbations.
- In EMS, we have an excellent end-point to help us get the dose “just right” - O2 sat of 88-92%.
- If you think your patients SOB is due to COPD (not asthma, CHF, pneumonia, etc.) **target O2 sat should be 88-92%**. Only use as much O2 as needed to get them there- no more!
- Change your practice TODAY! Stop slapping a NRB at 10L on every SOB patient.

Questions?

EMS Intubation and Survival in Cardiac Arrest

September 2010, Academic Emergency Medicine, Studnek et al:

"The Association between Prehospital Endotracheal Attempts and Survival to Hospital Discharge Among Out-of-hospital Cardiac Arrest Patients."

Objective:

- To determine if prehospital intubation attempts were associated return of spontaneous circulation (ROSC) and survival to discharge among individuals experiencing out of hospital cardiac arrest (OOHCA).

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"The Association between Prehospital Endotracheal Attempts and Survival to Hospital Discharge Among Out-of-hospital Cardiac Arrest Patients."

Design:

- Retrospective study. North Carolina.
- 1142 EMS patients with cardiac arrest.
- No ETI attempts vs. one attempt vs. more than one attempt.
- Also looked at initial rhythm; witnessed arrest?; shocked?; received CPR? (but not for how long CPR was performed- 3 minutes or 33 minutes!).

September 2010, Academic Emergency Medicine, Studnek et al:

"The Association between Prehospital Endotracheal Attempts and Survival to Hospital Discharge Among Out-of-hospital Cardiac Arrest Patients."

Main Outcome Measures:

- Did the patient have a "Sustained ROSC"?
- Did the patient "Survive to Hospital Discharge"?
- So, does attempting ETI in the arrested prehospital patient affect likelihood of ROSC or likelihood of survival?

September 2010, Academic Emergency Medicine, Studnek et al:

ROSC:

- 1142 total EMS cardiac arrest patients.
 - 299/1142 → had ROSC (26%)
 - 843 → no ROSC (74%)
- Those with no ETI attempt were 2.3x MORE likely to have a ROSC than those with 1 ETI attempt.
- For those with more than 1 ETI attempt the odds of ROSC were even less.

So, likelihood of ROSC was more than doubled for those with NO ETI attempts.

September 2010, Academic Emergency Medicine, Studnek et al:

Survival to Hospital Discharge:

- 299 total EMS cardiac arrest patients with ROSC.
 - 118/299 → survived to discharge(39.5%)
 - 181/299 → did not survive (60.5%)
- Those with **no** ETI attempt were 5.5x MORE likely to be discharged from the hospital alive than those with 1 ETI attempt.
- For those with more than 1 ETI attempt the odds of survival were even less.

The take-home points:

- This IS NOT a practice changing study. Why?- poor design (retrospective, so hard to control for the variables you care about- like duration of CPR!).

The take-home points:

- This IS NOT a practice changing study. Why?- poor design (retrospective, so hard to control for the variables you care about- like duration of CPR!).
- But, it certainly makes one think we need to know more about this topic; and we need to suspect that ETI attempts in arrested EMS patient may very well cause harm.
- Due to the multiple tasks that must be performed, the management of OOHCA remains one of the most complex scenes for an EMS professional.
- It has been well documented that ETI is a complex task and that providers have difficulty gaining and maintaining competency in this skill.

The take-home points:

- Prior research has indicated that prehospital ETI is a time-intensive task that may distract providers from performing important basic life support procedures during OOHCA.
- It has been recommended that advanced airway procedures be delayed, with emphasis placed on minimally interrupted chest compressions.
- This strategy has been associated with improved resuscitation outcomes.
- Research has also shown that hyperventilation can cause increased intrathoracic pressure, leading to decreased coronary and cerebral perfusion pressure among intubated OOHCA patients.

The take-home points:

- Orchestration and timing of procedures in OOHCA is typically the responsibility of the paramedic, who is also responsible for performing many critical and time sensitive actions.
- Each procedure or task takes time, and performing each nearly simultaneously is difficult.
- Providing airway management for an OOHCA patient by means other than ETI may decrease the number of distractions that occur.
- Having a basic life support responder provide airway management with a bagvalve mask or alternative airway device may free the paramedic to supervise the overall resuscitation.

Questions?

EMS Intubation and Survival in Cardiac Arrest... take two

January 2011, Prehospital Emergency Care, Egly et al:

"Assessing the Impact of Prehospital Intubation on Survival in Out-of Hospital Cardiac Arrest."

Objective:

- To compare the rates of survival to hospital admission and hospital discharge of non-traumatic OOHCA patients who received successful out-of hospital ETI and those who were not intubated.

January 2011, Prehospital Emergency Care, Egly et al:

"Assessing the Impact of Prehospital Intubation on Survival in Out-of Hospital Cardiac Arrest."

Design:

- Retrospective study...AGAIN!! Michigan.
- 1414 EMS patients with cardiac arrest.
- Only compared those successfully intubated vs. those with no attempts.
- This study has many of the limitations of the one we just reviewed...but it does make you think.

The take-home points:

- This study looked closely at VT/VF vs other rhythms:
 1. Double the survival rate if no ETI attempted for patients in a VF/VT rhythm.
- Why might no intubation attempts make such a difference in patients with VF/VT?

The take-home points:

- This study looked closely at VT/VF vs other rhythms:
 1. Double the survival rate if no ETI attempted for patients in a VF/VT rhythm.
- Why might no intubation attempts make such a difference in patients with VF/VT?
- This study looked closely at witnessed vs non-witnessed arrests:
 1. Almost triple the survival rate in a witnessed arrest if no ETI attempted.
- Why might no intubation attempts make such a difference in patients with a witnessed arrest?

Summary points:

- Again, due to a weak study design (retrospective) it is hard to consider either of these intubation papers practice changing.
- However, clearly there is data to suggest that:
 - in the case of every prehospital cardiac arrest,
 - especially if the patient is in a shockable rhythm,
 - or they have an EMS witnessed arrest...

Attention of BLS providers should be to the airway (OP, NP, BVM, meticulous technique, King tube), allowing ALS providers to focus on rhythm analysis, CPR supervision, IV, medications, scene management (i.e. start rolling).