# 3rd Annual EMS Medical Directors' Conference

Indiana State Department of Health

@INDTrauma #EMSMDConf2016

# Thank you supporters!

GOLD LEVEL SUPPORTER

Community Health Network

OTHER SUPPORTERS

LifeLine

ESKENAZI HEALTH

Indiana University Health
Methodist Trauma Center

Indiana State Department of Health
Trauma and Injury Prevention

# EMS Topics

## *Dr. Gerardo Gomez*

## *Dr. Dan O'Donnell*



@INDTrauma #EMSMDConf2016 #Gomez #ODonnell

# 3 EMS TRENDS EVERY EMS DOC SHOULD KNOW…AND SOME STRANGE

Dan O'Donnell
Director IUSOM Division of Out of Hospital Care
Medical Director IEMS/IFD

# Obligatory Disclosure Slide

- None

# EMS AND EM TRUTHS

- 100% of you will interact with EMS throughout your careers
  - On shift → Medical director
- Strong need to be aware of major issues affecting your prehospital providers
- EMS is an evolving science
- It is on you to ensure you are aware of MAJOR themes in prehospital care

# WE MAY NOT ALWAYS RECOGNIZE THE IMPACT

- AHA/ILCOR guidelines (2015)
- EMS usually the first to pick these up
- Current emphasis
  - Compression depth (2-2.5inch)
  - Rate 100
- Transportation destination
  - Cardiac arrest centers

# Question 1?

- What is the best way for EMS providers to deal with the dangerous patient?

# VIOLENCE AGAINST EMS PROVIDERS

# EMS IS DANGEROUS BUSINESS

- 75% report being physically assaulted in their career
- 40% report dealing with a violent patient in the last year
- 90% report verbal threats against them and/or their families by patients
- 70% feel that this violence is being fueled by the increasing use of intoxicants

*** Control et al.**

# WHAT ABOUT PHYSICAL RESTRAINTS

- 70% report the regular use of physical restraints for violent patients
- 37% often use law enforcement placed restraints
- 55% problems with “typical” physical restraints
  - 80% can’t place these on a violent patient by themselves
  - 17% have had patients escape from restraints

# SO WHAT CAN THEY DO ABOUT IT?

- Awareness
- Defensive tactics
- Carry weapons
- Chemical sedation
  - We all know and love versed
- Any alternatives?

# PREHOSPITAL KETAMINE

- Increased use in the ED over the past few years
- Scheppke et al. 2014
  - 52 patients receiving 4mg/kg of IM ketamine
  - ½ received additional doses of versed
  - 50 rapidly sedated
  - 3 with "negative side effects"
    - 1 BVM, 2 ETT


*Scheppke, K. A., et al. (2014). "Prehospital use of i.m. ketamine for sedation of violent and agitated patients." West J Emerg Med **15**(7): 736-741.*

# MORE INFO NEEDED

- Keseg and collegues looked at Ketamine use in 36 patients
  - Looked at IV (2mg/kg) and IM (4mg/kg) dosing
  - 32 patients demonstrated “improvement” in condition
  - 22% patients subsequently intubated
  - *Keseg, D., et al. (2015). "The Use of Prehospital Ketamine for Control of Agitation in a Metropolitan Firefighter-based EMS System." Prehosp Emerg Care **19**(1): 110-115.*

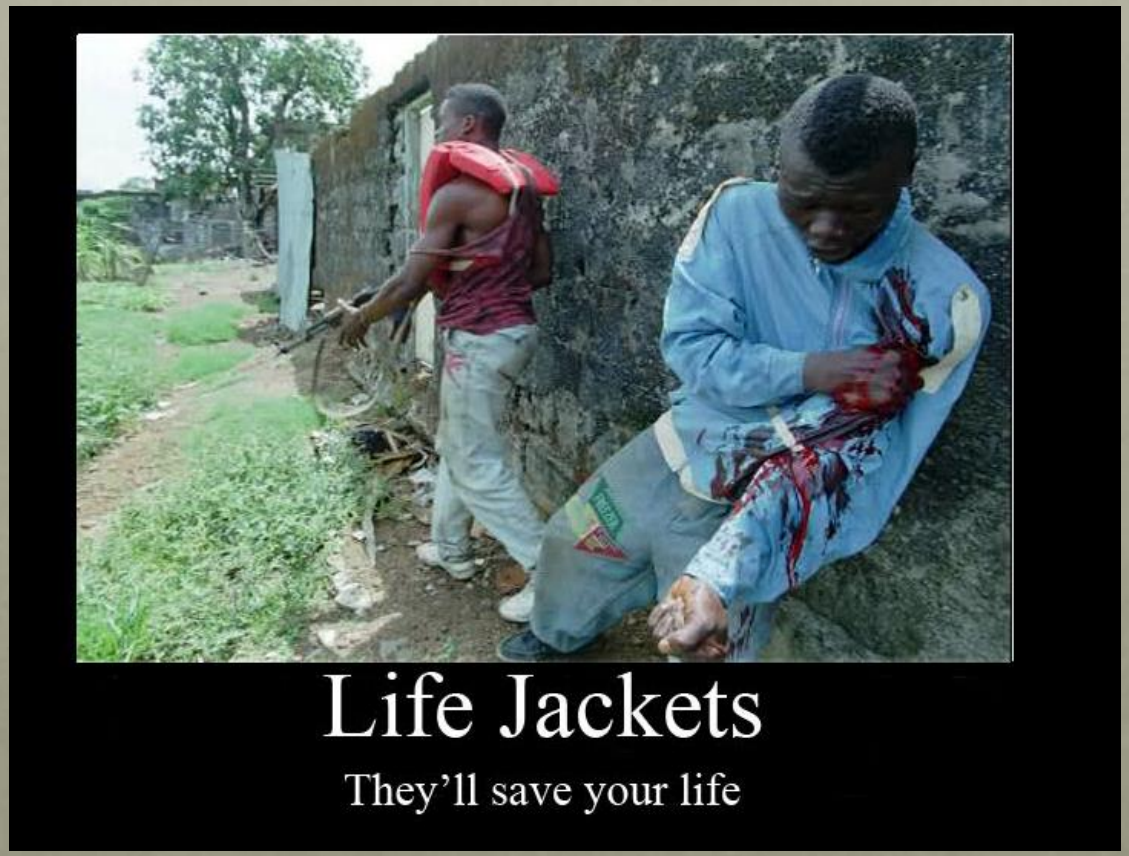
- Burnett
  - Examined IM doses and intubation rates
    - 29% patients intubated
      - Noted with higher doses 5-7 mg/kg
      - No intubation with doses closer to 4mg/kg
    - *Burnett, A. M., et al. (2015). "The association between ketamine given for prehospital chemical restraint with intubation and hospital admission." Am J Emerg Med **33**(1): 76-79.*

# SO NOW WHAT

- Violence against prehospital providers is on the rise
- More and more agencies are turning to alternative agents for sedation
  - Recent poll of nations med directors → **70% using Ketamine**
- Need better studies to figure out safety
  - Intubation rates > 20%
  - Our versed intubation rates are around 5%
- But it's coming!

# Question 2?

- What is the most effective way to stop a major arterial bleed in an extremity?



# ITS CRAZY OUT THERE

# Special Contribution

## An Evidence-based Prehospital Guideline for External Hemorrhage Control: American College of Surgeons Committee on Trauma

- ACS and NAEMSP recognizing the changing world of civilian hemorrhage control
- **Committee " Recommends the use of tourniquets in the prehospital setting for the control of isolated extremity hemorrhage if direct pressure is ineffective"**
- Weak evidence but support use of hemostatic agents
  - Quick Clot, HemCon, Combat Guaze etc…

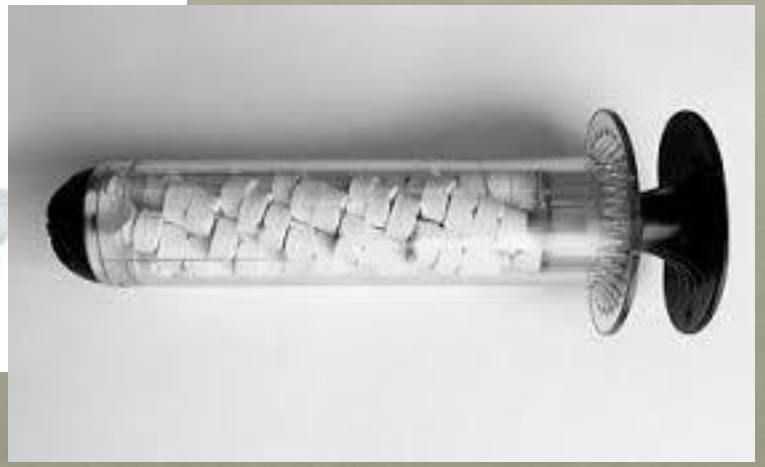
# LESSONS FROM BOSTON

- Total of 152 patients
  - 66 (43%) had at least one severe extremity injury
    - 29 had recognized extremity exsanguination recognized at the scene
      - **27 tourniquets applied (majority improvised)**
- Conclusion: Prehospital extremity hemorrhage control should mirror that of the military care

# TOURNIQUETS


# HEMOSTATIC AGENTS





# CONCLUSION

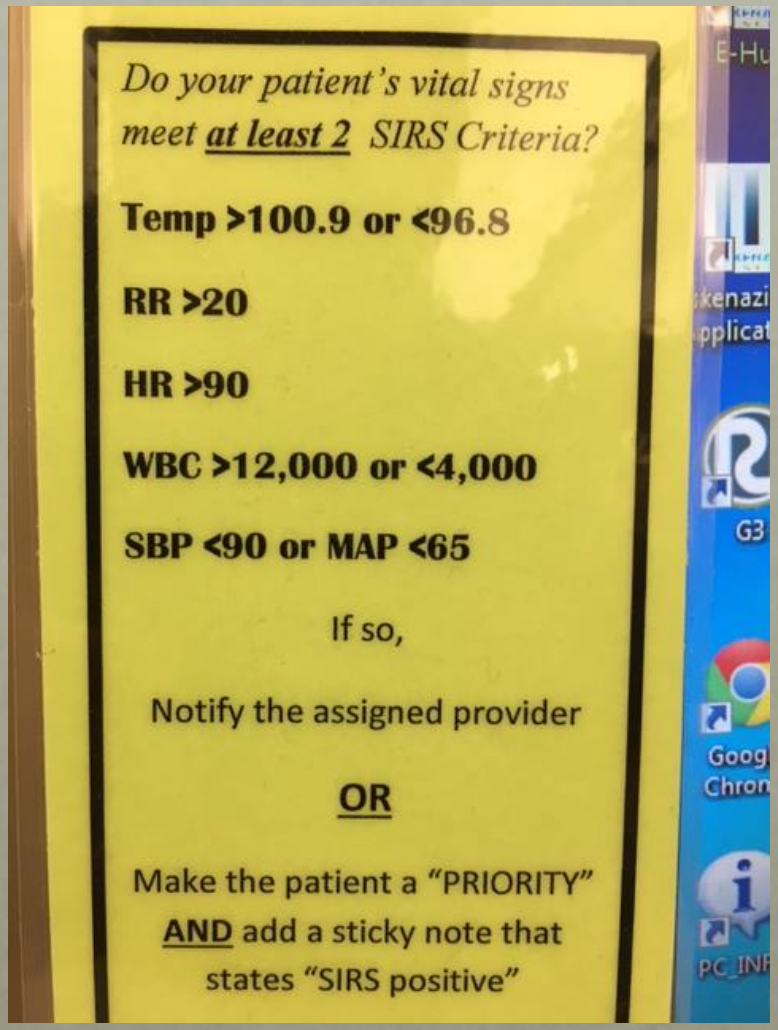
- More of a focus of early hemorrhage control in prehospital trauma management
  - CBA > ABC
- Military medicine encroaching on the civilian setting
- Be comfortable receiving patients with these devices
- Advocate for your EMS agencies

# Question 3?

- How many of you think your EMS system can help you with hospital metrics?

# IT'S A CHECK BOX WORLD

- Sepsis measures
- Door to balloon times
- Trauma consults
- 3-FAST
- 3- CATH
- Trauma 1
- Code 77



# WE HAVE SEEN THIS WORK WITH 12 LEADS

- 2005 (Brainard): Prehospital 12 lead/STEMI alert decreased Door to Balloon by 25 minutes
- 2013 (Cone): EMS STEMI activation improved compliance with the 90 benchmark to 100%
  - Compared to 72% in controls
- ? Impact on mortality
- Now recommended in 2015 AHA/ILCOR guidelines

# PREHOSPITAL STROKE NOTIFICATION

- Does prehospital notification make a difference?
- Does it change my practice?
- Should we roll out mobile stroke units?

# THE EVIDENCE

- 2008 (Abdullah):
  - Door to CT decreased (40 min vs. 47)
  - **tPA TWICE as likely (41% vs. 21%)**
- 2012 (Lin)
  - EMS stroke alerts significantly improved door to CT and door to treatment times (26 min vs. 31)
  - Door to needle times improved
  - **Again, tPA administration was higher**
- 2013 (Prabhakaran)
  - Door to tx 145 → 175
  - **#tPA increased by almost 3X**

# WHAT DOES THAT MEAN

- Prehospital stroke notification does save time to diagnosis
- Recognize an increase likelihood that patients will receive thrombolytics
  - Clear selection bias
- Be sure to incorporate EMS into your stroke care

# EMS SEPSIS ALERTS??

- Hunter and colleagues
  - Looking at EtCO2 combined with SIRS criteria to predict sepsis
  - Sepsis alert protocol
    - ≥ 2 SIRS Criteria **AND** EtCO2 ≤ 25
    - Notify hospital
  - Results
    - 78% who met criteria and followed protocol dx with sepsis
    - Sensitivity 90%
    - Specificity 58%

*Hunter, C. L., et al. (2016). "A prehospital screening tool utilizing end-tidal carbon dioxide predicts sepsis and severe sepsis." Am J Emerg Med.*

# SEPSIS ALERTS

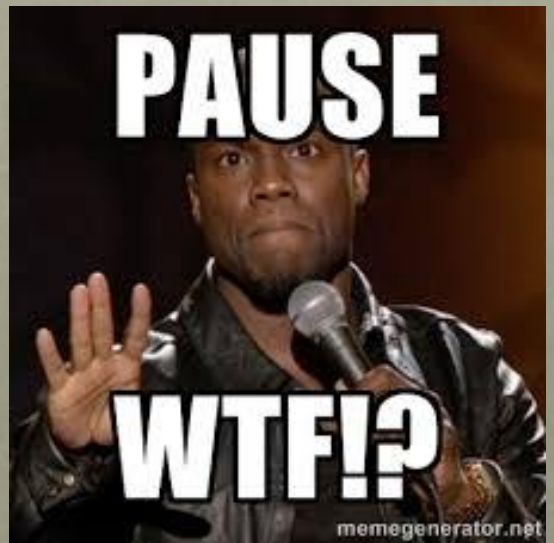
- Starting to look at improvement processes for sepsis
- Can prehospital SEPSIS alerts improve compliance with benchmarks?
  - Is there harm

# CONCLUSIONS

- Be open to new innovations in EMS
- Look to how they can assist you with your practice
- The day of 911 just take me to the hospital is changing

# WHAT ABOUT SOME CRAZY STUFF

- Lets have an ambulance that does CTs and push tPA on our stroke patients
- Refractory vfib patients should be taken right to the cath lab.
- Maybe everyone who calls 911 doesn't have to go to a hospital



# STROKE AMBULANCE

- Not so rare anymore
- Seeing pop up around the US
  - Houston
  - Cleveland
  - Denver
  - Toledo
  - Indy????
- Does it help?
- Does it help in an urban environment

# DON'T MESS WITH TEXAS!

- Currently doing the best "randomized" study
- MSU On vs. MSU off weeks
- Dispatch for all code strokes
- Neurologist on board and independent neurologist on board deciding on tPA
  - After CT
- Looking at outcomes
- 24 received tPA to date
  - No hemorrhagic complications

# NEUROLOGIST ON AN AMBULANCE?????

# WHERE IS THIS GOING?

- Enrolling more sites
- Trying to look at comparison to "controls"
- Big question → What is the correct setting
  - Urban
    - How large of a city?
  - Rural
    - How rural
- Always looking to ask the question "Is earlier better?"

# WHAT IS THIS?

# EARLY STUFF OUT OF MINNESOTA

- Placing patients on the LUCAS Device
- Refractory V-fib goes bypasses the ED and goes right to the cath lab
- N = 4
  - 3 survived
- What???

# ALTERNATIVE DESTINATIONS

- Early experience of transporting low acuity folks to urgent care clinics
- Transportation of intoxicated patients to designated "sobering facilities"
- Transportation of psychiatric patients to mental health centers
- Look for this area to grow

# WHAT DOES IT MEAN

- EMS systems are different everywhere you go
- Science still in infancy stage
- There are some big trends out there that you have to be aware of
- Embrace the change
- Don’t push off the weird

# QUESTIONS?

# Questions?

Contact Us:

Email: indianatrauma@isdh.in.gov

Website: indianatrauma.org

Follow us on Twitter @INDTrauma

Indiana State Department of Health