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HEALTH SCIENCES PROGRAMS

# A Breathless Example of Evidence Based Learning

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Director, Emergency Health Services Program

**November 13, 2010**

**Virginia EMS Symposium**

# Objectives

Explain what **Evidence Based Medicine** means to out-of-hospital providers.

Be aware of six references you can use when developing an **Evidence Based Medicine** project.

Recite four recommended practices when guiding the students through a project.

# Background

Four session course teaching Evidence Based Medicine as part of a semester-long undergraduate ***EMS Systems*** course

Developed as the culminating activity for a graduate ***Master Teacher Program in Medical Education***

What was learned after five deliveries to 73 students, Fall 2007 to Spring 2010

# Creating an Evidence-Based Medicine Case Study

Michael J. Ward, Department of Emergency Medicine



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## Introduction:

This presentation describes an evidence-based medicine case study that was added to an undergraduate "EMS Systems Design" course that is part of the EMS Management component of the Bachelor of Science in Health Science program.

## EMS Systems Design

Students taking the semester-long on-line EHS 170 course are early to mid-career emergency service professionals completing their undergraduate degree. Averaging five years of field experience, this component introduces them to the concept of evidence-based medicine as well as the research resources available at the university.

The application assignment requires them to consider the evidence and apply it to a realistic situation by creating a policy document for the operating medical director.

### EBM Application Assignment: Out Of Hospital Intubations

- 1) Should NO paramedic be allowed to intubate out of hospital?
- 2) If SOME paramedics will be allowed to intubate, how many LIVE intubations/year would be considered a minimum level of activity?
- 3) If some paramedics will be allowed to intubate, how many attempts should be allowed out-of-hospital before going to the combitube?
- 4) If you use an average of one intubation a month, how will you track or identify the ET-approved field paramedics?

Whatever measurements or thresholds must be referenced to a research document.

GRADUATE SCHOOL OF EDUCATION  
AND HUMAN DEVELOPMENT  
— Leading Innovation through Learning

## EVIDENCE BASED MEDICINE SEGMENT of EHS 170 EMS Systems Design

### Week 5: Introduction to EMS Research

Sayre, White, and Brown (2002) The National Research Agenda Executive Summary. *Ann Emerg Med*. 40:636-643  
Institute of Medicine (June 14, 2006) *Emergency Medical Services At the Crossroads*. Chapter 7: Optimizing Prehospital Care through Research 161-178  
Maio, RF (2004) Overview of Prehospital EMS Research (31 PowerPoint slides)

Visit the following websites: NAEMSP National EMS Research Agenda, Society for Academic Emergency Medicine and National EMS for Children Data Analysis Center

#### Week 5 Discussion questions:

The 2006 Institute of Medicine research recommendations are different than the 2002 National Research Agenda. Does that mean that the National Research Agenda is no longer applicable?

Demonstrate accessing Himmelfarb by locating an article describing research performed by an EMS agency. Describe what they did and either upload the article or provide a link.

### Week 6: Introduction to Evidence-Based Medicine

Take Duke University Medical Center Library (4th edition 2004) online tutorial "Introduction to Evidence-Based Medicine"  
Elizabeth Criss (2000) *EMS Research: Obstacles of the Past, Opportunities in the Present, Models for the Future*  
Bryan Bledsoe (2004) *An Introduction to EMS Research* (90 Powerpoint slides)

Visit the following websites: UCLA Prehospital Care Research Forum, Evidence-Based Medicine Education Center of Excellence and The Centre for Health Evidence

#### Week 6 Discussion questions:

Assume that "evidence-based medicine" is just the scientific application applied to medical research. How does the scientific method differ from personal experiences?

Assume you are looking at two different treatments of cardiac arrest patients. Treatment A delivers 45% of cardiac arrest patients to the emergency department with restoration of spontaneous circulation (ROSC). Treatment B delivers 30% of cardiac arrest patients to the ED with ROSC. Of those patients delivered to the ED with ROSC, 70% of Treatment A patients die within 72 hours and 40% of Treatment B patients die within 72 hours. Assuming that you have a choice, which treatment would you select for your impending cardiac arrest?

### Week 7: Applying Research to EMS Results

Rea, Eisenberg, Becker, et al: Emergency Medical Services and Mortality from Heart Disease: A Community Study. *Ann Emerg Med* April 2003;41:494-499.  
Mickey Eisenberg The C. J. Shanaberger Lecture: The Evolution of Prehospital Cardiac Care: 1966–2006 and Beyond Prehospital Emergency Care October-December 2006 10(4) 411-417

#### Week 7 Discussion questions:

The American Heart Association changes the CPR and Advanced Life Support Protocols every five years. Based on the information provided by Dr. Eisenberg, are the latest changes an example of evidence-based medicine?

### Week 8: No more paramedic intubations!

Burton JH Out of Hospital Endotracheal Intubation: Half Empty or Half Full? (Editorial) 27 February 2006 *Ann Emerg Med* June 2006 (Vol. 47, Issue 6, Pages 542-544)  
Wang HE, Yerly DM Out-of-Hospital Endotracheal Intubation: Where Are We?, 27 February 2006 *Ann Emerg Med* June 2006 (Vol. 47, Issue 6, Pages 532-541)  
Zink BJ, Maio RF Out-of-hospital endotracheal intubation in traumatic brain injury: Outcomes research provides us with an unexpected outcome, 19 August 2004 *Ann Emerg Med* November 2004 (Vol. 44, Issue 5, Pages 451-453)  
OPTIONAL ONLINE REFERENCES  
Smith E, et al. The Cochrane Library as a Resource for Evidence on Out-of-Hospital Health Care Interventions *Ann Emerg Med* March 2007 (Vol. 49, Issue 3, Pages 344-350)  
Four page 165 KB Adobe Acrobat document  
Rowe BH, Brown MB. A Primer on the Cochrane Collaboration, Its New Priorities in Out-of-Hospital and Emergency Health, and the Role of Annals of Emergency Medicine. *Ann Emerg Med* March 2007 (Vol. 49, Issue 3, Pages 351-354)

### EBM Application Assignment: Breathless in Furrow County

**Breathless in Furrow County.** You are asked by the EMS operating medical director to provide a researched protocol on paramedic out-of-hospital intubation.

**Paramedic ET performance.** Excel spreadsheet of 59 Furrow County paramedic intubation performance

**Out of Hospital Intubation: Where are We?** January 2007 presentation by Dr. Wang at the National Association of EMS Physicians meeting. Based on his meta-survey.

# Who are the students?

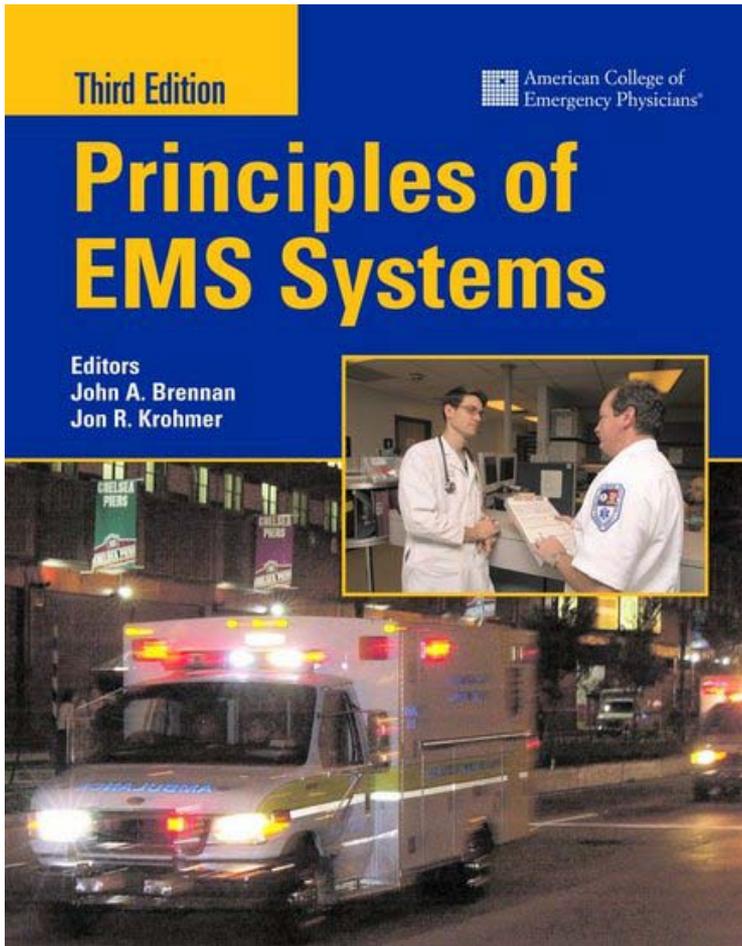
Admitted to the **Bachelor of Science in Health Science *EMS Management*** degree program

60+ semester hours of completed work

Early to mid career emergency service providers

Two-thirds are/were paramedics, all are EMT-Basics (or equivalent)

# EHS 170: EMS Systems Design



*(4 credit hours)*

Analysis of the components and characteristics of emergency medical services systems at the local, regional, state, and national levels; various systems configurations; strategies for evaluating system effectiveness and efficiency.

# Each week in DE EHS course

Readings from textbook + supplemental items posted in Blackboard.

Student posts response to 3 to 6 open-ended discussion questions.

Student responds to one colleague's post

Professor summarizes responses and provides a wrap-up.

**30 – 45% of grade**

# DE EHS project/role play

Fall 2007 replaced EHS 170 project with Evidence-Based Medicine segment **25% of grade**

Provide recommendation to “Furrow County”  
Operational Medical Director

- 1) Should NO paramedic be allowed to intubate out of hospital?*
- 2) If SOME paramedics will be allowed to intubate, how many LIVE intubations/year would be considered a minimum level of activity?*
- 3) If some paramedics will be allowed to intubate, how many attempts should be allowed out-of-hospital before going to the combitube?*
- 4) If you use an average of one intubation a month, how will you track or identify the ET-approved field paramedics?*



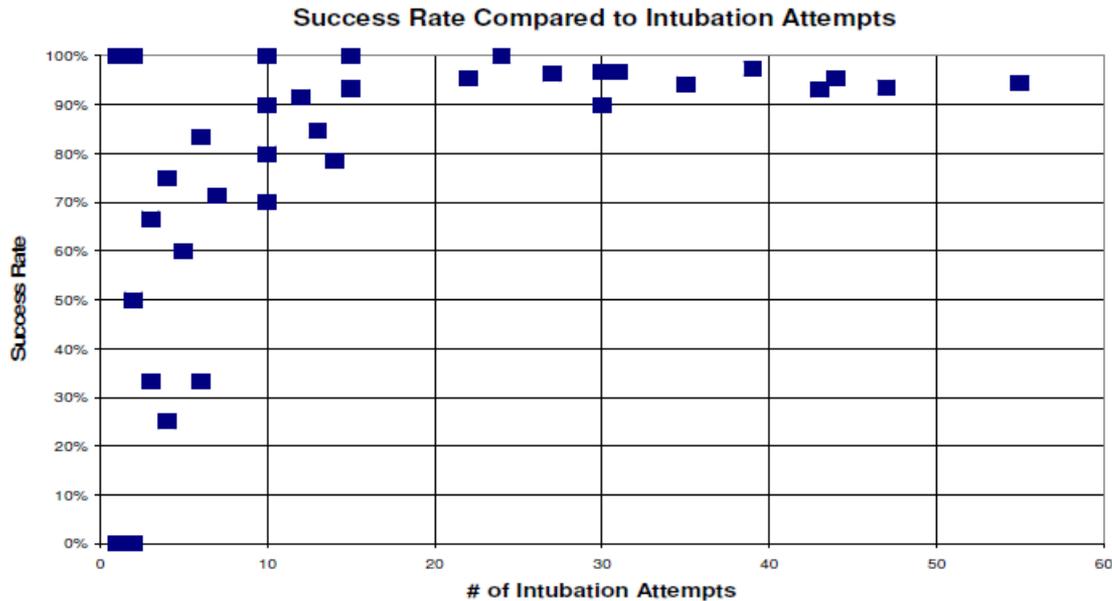
# 1<sup>st</sup> take-home: Realistic Project

After second semester, broke down providers by their role.

Added information on how to write a policy recommendation that appropriately referenced peer-reviewed research

*(Respond to the four questions)*

Added a week to allow students to work on policy document



**Student provided Furrow County data analysis**

Spring 2008

Tom Fogarty

Now 3<sup>rd</sup> year medical student

|                | Memorial Medevac Services | Furrow Fire Dept. | Furrow County EMS | Total        |
|----------------|---------------------------|-------------------|-------------------|--------------|
| Admin          | 76% (17)                  | n/a               | 63% (8)           | 72%          |
| Medic          | 95% (304)                 | 57% (23)          | 70% (123)         | 86%          |
| Per-Diem       | 94% (35)                  | n/a               |                   | 94%          |
| EMS Supervisor | n/a                       | n/a               | 97% (103)         | 97%          |
| <b>Total</b>   | <b>93.8%</b>              | <b>56.5%</b>      | <b>81.6%</b>      | <b>87.7%</b> |

# 1: Intro to EMS Research

Sayre, White, and Brown (2002) The National Research Agenda Executive Summary. *Ann Emerg Med.* 40:636-643

Institute of Medicine (June 14, 2006) **Emergency Medical Services At the Crossroads.** Chapter 7: Optimizing Prehospital Care through Research 161-178.

Maio, RF (2004) **Overview of Prehospital EMS Research** (31 PowerPoint slides)

Websites:

- Society for Academic Emergency Medicine
- National EMS for Children Data Analysis Center

# 1: Intro to EMS Research

Discussion Question:

The 2006 Institute of Medicine research recommendations are different than the 2002 National Research Agenda.

**Does that mean that the National Research Agenda is no longer applicable?**

# 1: Intro to EMS Research

Using the professional journal search database at the Himmelfarb Health Sciences library, find an article describing research on prehospital (out-of-hospital) emergency medicine.

- **Briefly describe what they did and either upload the article or provide a link.**

***(Opportunity to explain what qualifies as peer-reviewed research)***

# 2<sup>nd</sup> take-home: PDF everything

Original concept was that students would access all of the peer-reviewed articles through Himmelfarb.

Problem for rural, military and international students (bandwidth, quality of connection)

Made Adobe Acrobat .pdf files of all articles, PowerPoint presentations and some web pages.

## 2: Evidence Based Medicine

Elizabeth Criss (2000) **EMS Research: Obstacles of the Past, Opportunities in the Present, Models for the Future**

– from UCLA prehospital care research forum

Bryan Bledsoe (2007) **The Good, The Bad, and the Ugly of EMS Research**

– 108 slide PowerPoint presentation

## 2: Evidence Based Medicine

Complete Duke University Medical Center Library (4<sup>th</sup> edition 2004) online tutorial  
***“Introduction to Evidence-Based Medicine”***

Visit these websites

- UCLA Prehospital Care Research Forum
- Evidence-Based Medicine Education Center of Excellence
- The Centre for Health Evidence

# Introduction to Evidence-Based Medicine



**Click to start**

# 3<sup>rd</sup> take-home: variable compliance

[Welcome](#)

[What is EBM?](#)

[Clinical Question](#)

[Literature Search](#)

[Evaluating Evidence](#)

[Test Your Knowledge](#)

[References / Glossary](#)

[Feedback](#)

## Objectives

Welcome. This tutorial is intended for any health care practitioner or student who needs a basic introduction to the principles of Evidence-Based Medicine.

Upon completion of this self-paced tutorial, you will be able to:

- define Evidence-Based Medicine (EBM)
- identify the parts of a well-built clinical question
- identify EBM searching strategies that could improve MEDLINE retrieval
- identify key issues that help determine the validity of the results of a study

This tutorial is not designed to teach you how to search the literature.

***Not all of the students will complete the tutorial***

## 2: EBM discussion question

Treatment A delivers 45% of cardiac arrest patients to the emergency department with restoration of spontaneous circulation (ROSC).

Treatment B delivers 30% of cardiac arrest patients to the ED with ROSC.

Of those patients delivered to the ED with ROSC:

70% of Treatment A patients die within 72 hours

40% of Treatment B patients die within 72 hours.

**Assuming that you have a choice, which treatment would you select for your cardiac arrest?**

## 2: EBM discussion question

Assume that “evidence-based medicine” is just the scientific method applied to medical research.

**How does the scientific method differ from personal experiences?**

*(EHS 170 also covers information on EMS databases and data analysis at this session)*

## 4<sup>th</sup> take-home point

More generous and expansive response to situational questions than conceptual.

Avoid questions that can be completely answered by first poster.

***“Using an organization familiar to you, describe how XYZ would impact them.”***

# 3: Applying Research to EMS

Mickey Eisenberg *The C. J. Shanaberger Lecture:  
The Evolution of Prehospital Cardiac Care:  
1966–2006 and Beyond* **Prehospital  
Emergency Care** October-December 2006  
10(4) 411-417

Rea, Eisenberg, Becker, et al: *Emergency Medical  
Services and Mortality from Heart Disease: A  
Community Study.* **Ann Emerg Med** April  
2003;41:494-499.

# 3: Mini lecture

## *Peer Reviewed research and the creation of knowledge*

- Difference between role of community/ technical college and university
  - How peer-reviewed research gets into textbooks
- Review of what was covered in past two sessions
  - Bledsoe debunking EMS myths
  - Devil is in the details of each peer-reviewed article

# 3: EBM impact

Ward, Michael (2010) *Evidence Based Impact on Out-of-Hospital Care* presented January 27th at GWU Paramedic Refresher. (20 slides)

- *Resuscitation Outcomes Consortium (ROC)*
- *Eagles Position Paper on Urban Care*
- *Intubation Research*
- *Wake Advanced Practice Paramedics*
- *2011 AHA Standards*
- *Paramedic Scope of Practice*

# 3: Applying Research to EMS

Highlight observation from Dr. Eisenberg:

Few communities report long-term temporal data, but those that do show no improvement in survival. ***A study from King County, Washington, demonstrated no improvement in survival rate over 25 years.***

It is clear that over this time there were factors that increased survival, such as more defibrillation by emergency medical technicians and more bystander CPR, but there were concurrent factors that decreased survival. The average age of patients increased and response times increased.

# 4: No more paramedic intubations!

Burton JH Out of Hospital Endotracheal Intubation: Half Empty or Half Full? (Editorial) 27 February 2006 ***Annals of Emergency Medicine*** June 2006 (Vol. 47, Issue 6, Pages 542-544)

Wang HE, Yerly DM Out-of-Hospital Endotracheal Intubation: Where Are We?, 27 February 2006 ***Annals of Emergency Medicine*** June 2006 (Vol. 47, Issue 6, Pages 532-541)

## 4: No more paramedic intubations!

Zink BJ, Maio RF Out-of-hospital endotracheal intubation in traumatic brain injury: Outcomes research provides us with an unexpected outcome, 19 August 2004 ***Annals of Emergency Medicine*** November 2004 (Vol. 44, Issue 5, Pages 451-453)

***These three articles are the foundation for the Furrow County intubation policy***

# EBM policy document

Provide recommendation to “Furrow County”  
Operational Medical Director

- 1) *Should NO paramedic be allowed to intubate out of hospital?*
- 2) *If SOME paramedics will be allowed to intubate, how many LIVE intubations/year would be considered a minimum level of activity?*
- 3) *If some paramedics will be allowed to intubate, how many attempts should be allowed out-of-hospital before going to the combitube?*
- 4) *If you use an average of one intubation a month, how will you track or identify the ET-approved field paramedics?*

# Optional resources

Smith E, et al. The **Cochrane Library** as a Resource for Evidence on Out-of-Hospital Health Care Interventions *Annals of Emergency Medicine* March 2007 (Vol. 49, Issue 3, Pages 344-350)

Rowe BH, Brown MB. A Primer on the Cochrane Collaboration, Its New Priorities in Out-of-Hospital and Emergency Health, and the Role of *Annals of Emergency Medicine*. *Annals of Emergency Medicine* March 2007 (Vol. 49, Issue 3, Pages 351-354)



# The Cochrane Collaboration

Working together to provide the best evidence for health care

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- [Top 50 Reviews](#)
- [Review structure](#)
- [Sample Review](#)
- [Evidence Aid Project](#)
- [Registering Titles](#)

## Navigation aids

## Cochrane Reviews

### What are Cochrane Reviews?

Cochrane Reviews are systematic reviews of primary research in human health care and health policy. They investigate the effects of interventions for prevention, [treatment](#) and rehabilitation. They also assess the accuracy of a diagnostic test for a given condition in a specific patient group and setting.

Each systematic review addresses a clearly formulated question; for example: *Can antibiotics help in alleviating the symptoms of a sore throat?* All the existing primary research on a topic that meets certain criteria is searched for and collated, and then assessed using stringent guidelines, to establish whether or not there is conclusive evidence about a specific treatment. The reviews are updated regularly, ensuring that treatment decisions can be based on the most up-to-date and reliable evidence.

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- [Practitioners, providers & policymakers](#)
- [Patients](#)
- [Authors & researchers](#)
- [Journalists & bloggers](#)

## Special Collections from The Cochrane Library

- [Neurological cancers](#)

## 4: Discussion Question

Wang HE, Yerly DM “Out-of-Hospital Endotracheal Intubation: Where Are We?” is a meta-study that paints a bleak picture for the continuation of out-of-hospital intubation.

***For THIS week, either (a) compare Dr. Wang's finding with YOUR ems agency or (b) tell me two pieces of information you will need to write a decision document supporting or opposing a policy that prohibits out-of-hospital intubation.***

# Session 5 question

## EMS Skill: flesh, plastic or digital?

**What is the most EFFECTIVE way to maintain high proficiency with infrequently used complex ems skills?**

- Is it supervised practice on live patients in a hospital or clinic setting.
- Is it using "Fred the Head" or other plastic substitutes?
- Is it participating in resuscitation practice on a \$20,000 patient simulator?
- Is it using computer virtual reality to manipulate pixels that imitate the real thing?

# Session 6: Submit response

## Provide recommendations to “Furrow County” Operating Medical Director

- 1) Should NO paramedic be allowed to intubate out of hospital?*
- 2) If SOME paramedics will be allowed to intubate, how many LIVE intubations/year would be considered a minimum level of activity?*
- 3) If some paramedics will be allowed to intubate, how many attempts should be allowed out-of-hospital before going to the combitube?*
- 4) If you use an average of one intubation a month, how will you track or identify the ET-approved field paramedics?*

**Recommendations must be supported by  
peer-reviewed research**

# 5<sup>th</sup> take-home: many “correct” papers

The ability to answer the four policy-related questions is related to experience.

Senior medics in leadership positions will respond to the four questions but struggle with the peer-reviewed attribution.

Teenaged undergraduates have no idea how to formulate a policy, but can integrate the peer-reviewed research into a “big-picture” response.

# Grading criteria

- Were all four questions answered?
- Were the recommendations linked to peer-reviewed literature?
- If I was the operational medical director, was the document understandable?
- Did the student use additional peer-reviewed research?
- Was an actionable plan proposed?

# Grading results (n = 73)

All four questions answered? (33 45% )

Recommendations linked to peer-reviewed literature? (67 92% )

Was document understandable to OMD?  
(57 78% )

Additional peer-reviewed sources? (49 67%)

Actionable plan proposed? (09 12% )

Returned for rewrite (03 04% )

# 7: Follow-up question, part A

The Medic Supervisors are doing 22-30 intubations a year with a success rate of 97%

As a group, the full-time medics are averaging 70% with 30 paramedics averaging 4.1 intubations a year.

A subset of the field paramedics [SKM, GMM, LTF, ATE, HJU and RTW] are doing 10-15 intubations a year with a 85% success rate. These paramedics either work on Medic 2 or fill-in as a medic supervisor.

***By the way, if I remove these six from the report, the EMS agency paramedics success rate plummets to 47%. 24 paramedics are averaging two intubations a year.***

## 7: Follow-up question, part B

***Should you restrict out-of-hospital intubations to a particular unit (EMS supervisor and Medic 2) or just to those individuals who achieve 10 or more live intubations a year?***

What about FHF (Fire) and LAW (EMS Admin)? As part-time medics on the helicopter they get a lot of live intubations, but few in their full-time job. Do you count ALL of their Furrow County intubations? What if a paramedic is moonlighting in a different jurisdiction?

# 13: Evidence Based EMS Policy and Practices

## Mammogram policy:

- Williams, Mary Elizabeth (18 Nov 2009) ***Hold off on that mammogram? New guidelines for breast cancer screenings say you can wait - but should you? Broadsheet @ Salon.com***
- (20 Nov 2009) ***Opening the Screen Door: Slate writers and editors discuss whether new cancer-screening guidelines should be considered a harbinger of health care rationing.***

# 13: Mammogram policy

Steven Pearlson (Washington Post - 20 Nov 2009) says:

*"Health and Human Services Secretary Kathleen Sebelius did a marvelous job this week of undermining the move toward evidence-based medicine with her hasty and cowardly disavowal of a recommendation from her department's own task force that women under 50 are probably better off not getting routine annual mammograms."*

**Do you agree or disagree? How would you handle a significant change in ems practices due to evidence-based research?**

# 13: Evidence Based EMS Policy and Practices

## Return of Spontaneous Circulation:

- Ward, Michael (09 Nov 22) ***The Neon Red Elephant of EMS*** (FD takeover of Kansas City MAST) Accessed from **Firegeezzer.com** on 11/30/2009
- Ward, Michael (08 June 03) ***The Seattle Secret*** (ROC study and continuous closed chest compressions) Accessed from **Firegeezzer.com** on 11/30/2009

# 13: ROSC and CCCC

In the May 2010 fire department takeover of the Kansas City legacy MAST ambulance service, Fire Chief Dyer says that they will not need to maintain a high performance EMS system goal of getting an ALS ambulance to the scene within 8:59 minutes 90% of the time.

Dyer points out that they have almost doubled their "return of spontaneous circulation" with the response of fire companies performing **continuous closed chest compression (CCCC)** and AEDs.

This runs counter to 30 years of effort in establishing high performance EMS (ambulance) systems.

**As a GWU educated EMS expert, what do you think this means for the future of EMS system design?**

# 13: Evidence Based EMS Policy and Practices

- **ALS response times:**
  - Best Practices summary and **Evidence Based Performance Measures in *Prehospital Emergency Care*** April/June 2008

# SPECIAL CONTRIBUTIONS

## **EVIDENCE-BASED PERFORMANCE MEASURES FOR EMERGENCY MEDICAL SERVICES SYSTEMS: A MODEL FOR EXPANDED EMS BENCHMARKING**

**A STATEMENT DEVELOPED BY THE 2007 CONSORTIUM U.S. METROPOLITAN MUNICIPALITIES' EMS MEDICAL DIRECTORS (APPENDIX)**

J. Brent Myers, MD, MPH, Corey M. Slovis, MD, Marc Eckstein, MD, MPH,  
Jeffrey M. Goodloe, MD, S. Marshal Isaacs, MD, James R. Loflin, MD,  
C. Crawford Mechem, MD, Neal J. Richmond, MD, Paul E. Pepe, MD, MPH

## US Metropolitan Municipalities' EMS Medical Directors 2007 Consortium Position Paper

Proposed a new model for EMS benchmarking that includes implementation and documentation of specific interventions.

Each of the proposed interventions, alone or in conjunction with other recommended interventions, was determined to be effective in improving patient outcome, according to the group.

In addition, the group recommended a modification of the traditional response time measurement that recognizes the importance of CPR and AEDs in cardiac arrest response.

TABLE 1. Key Treatment Elements for Various Clinical Entities Encountered by EMS Systems

| Clinical Area                               | Elements in Model  |
|---|--|
| ST-Elevation Myocardial Infarction (STEMI). | Aspirin (ASA), if not allergic<br><br>12-Lead electrocardiograph (ECG) with prearrival activation of interventional cardiology team as indicated<br>Direct transport to percutaneous coronary intervention (PCI) capable facility for ECG to PCI time < 90 minutes |
| Pulmonary edema                             | Nitroglycerin (NTG) in absence of contraindications<br>Noninvasive Positive Pressure Ventilation (NIPPV) preferred as first-line therapy over endotracheal intubation  |
| Asthma<br>Seizure                           | Administration of beta-agonist<br>Blood glucose measurement<br>Benzodiazepine for status epilepticus   |
| Trauma                                      | Limit non-entrapment time to < 10 minutes<br>Direct transport to trauma center for those meeting criteria, particularly those over 65 (with time consistent caveats for air medical transport situations)  |
| Cardiac arrest                              | Response interval < 5 minutes for basic CPR and automated external defibrillators (AEDs)   |

# No ALS response interval

*In justifying its cardiac arrest recommendation, the group noted that much of the clinical research used to establish acceptable ALS response time intervals was conducted prior to the widespread dissemination of AEDs and at a time in which the compression component of CPR was not emphasized as it is now.*

*As a result, the consensus group proposed that EMS systems not focus response time measurement on ALS ambulances, but rather pay greater attention to **first response/BLS response time** to measure what it called the **“most important predictive elements for optimal outcome: time elapsed until initiation of basic chest compressions and time elapsed until defibrillation attempts.”***

# 13: ALS response times

You are consulting at a metro fire department that has 55 fire companies (engine, truck, heavy rescue and fireboat) staffed with at least one paramedic/firefighter.

Four platoon work system, the department needs 264 paramedics. Struggle to keep 175 paramedic/firefighters on the job. Gone to court to require firefighters to pass paramedic training and maintain their certification.

**How would you sell the idea that assuring all 55 units have a working AED is more important than keeping a paramedic on the rigs?**

# From intubation to system

Wake County EMS appears the one of the first to adopt a reporting system matched to the 2007 Eagles position paper on Evidence Based Performance



# STEMI

S-T segment elevation acute myocardial infarction (STEMI) treatment bundle – every 15 patients treated correctly according to this bundle results in the prevention of one stroke, acute MI, or death.

302 number treated

17 patients for whom stroke, MI, or death prevented.



# Pulmonary Edema

Every 6 patients treated results in the prevention of one endotracheal intubation (usually associated with admission to the hospital ICU rather than a non-critical care unit).

295 number treated

59 ICU admissions/ventilator placements avoided.



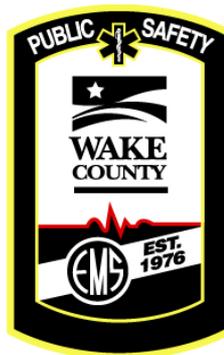
# Trauma

Every 11 patients appropriately transported to a Level I trauma center results in the prevention of one death.

496 number treated  
45 patients for whom death was avoided.

Every 3 patients over 65 appropriately transported to a Level I trauma center results in the prevention of one death

35 number treated  
12 patients for whom death was avoided



# Thanks for stopping by

Mike Ward

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