The Top Ten Issues in EMS 2007

A Glance in All Directions
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Associate Professor of Emergency Medicine, Surgery, and Allied Health
and
Co-Chair of the Section on EMS, Disaster Medicine, and Homeland Security
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Chief of Operations
The Dallas Metropolitan BioTel System
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Medical Director of Mid Georgia Ambulance Service and Douglas County Fire Department
**WORLD**

Bomb found on French rail line

Wednesday, March 24, 2004

**WORLD**

Basra bombs kill at least 68 Iraqis

18 schoolchildren among the dead, police say

Wednesday, April 21, 2004

**WORLD**

Report: 18,000 al Qaeda fighters

LONDON, England (AP) -- Despite losses around the world, al Qaeda has more than 18,000 potential terrorists, and its ranks are growing because of the conflict in Iraq, a leading think tank warned Tuesday.

Tuesday, May 25, 2004
Destroyed railway carriages sit in the Atocha railway station in Madrid, after 10 terrorist bombs ripped through commuter trains, killing more than 190 people and injuring 1,200 others. (Voice of Chris Wright, AP-Madrid correspondent)
Madrid in chaos and terror
Where DO we go from here?
The advance of technology is guiding our care as never before.
Saving lives (and treating patients) is getting more complicated every day
What are the EMS Issues

“Who really are we?”
We are no less than the keepers of the keys to excellence.
So, what’s up RIGHT NOW?
The Now Issues

**Clinical**

- Patient Assessment
- Airway
- ET Intubation
- The "Smart Bag"
- The "rescue airway"
- Capnography
- Avoiding overventilation
- CPAP
- ResQ Pod
- Intraosseous
- 12 Lead ECG
- ECG Transmission?
- Hypertonic Saline

**Administrative**

- Finding Staff
- NEMSIS
- Credentialing Online
- ePCR
- Non-transport
- Statewide Protocol Set
- Standard Treatment List
- Holding the wall
- Diversion
- House call?
- Research
- Distributive learning
- Preparedness
And NOW...

the TOP TEN

EMS Issues!
#10. Patient Assessment
The Primary Survey

Scene Survey/Mechanism/# pts.

LOC/Airway/Cspine

Respiratory Rate and Labor

Pulses R & Q, N & W
Skin CMT/CRT/External Bleeding

Neck appearance, JVD, Trachea

Chest appearance, BS, HT

Quick survey of abdomen, pelvis, extremities, and back

Abbreviations:

R & Q – Rate and Quality
N & W – Neck and Wrist
CMT – Color, Moisture, Temperature
CRT – Capillary Refill Time
JVD – Jugular Venous Distension
BS – Breath Sounds
HT – Heart Tones
Scene Survey/Mechanism/# pts.
LOC/Airway/C-spine
Respiratory Rate and Labor
Pulses R & Q, N & W
Skin CMT/CRT/External Bleeding
Neck appearance, JVD, Trachea
Chest appearance, BS, HT
Quick survey of abdomen, pelvis, and extremities

Reveals threats to Basic Physiology

...the vital elements of the Primary Survey
The Order of the Survey

...flows in an orderly way from head to toe
The Secondary Survey

Head

Neck

Upper Extremities

Chest

Abdomen

Pelvis

Lower Extremities
The Third Survey

LOC

Airway

Breathing

Circulation

Any other pertinent positive or negative found in the primary or secondary surveys

For example, if wheezing was found and treated in the primary survey, is the wheezing still there?

If external bleeding was found and a dressing put on it, is the bleeding still stopped?
We showed as far back as 1987 that patient assessment skills are quickly lost if not practiced.

Presentation to the International Emergency Medicine Conference
London, England
September, 1987
We MUST maintain our Assessment Skills
#9. Airway Management
Airway

What we’ve done in the past does not appear to be good enough now.
Manipulating the airway recklessly indeed appears to have negative physiological consequences.

*Increased incidence of death with traumatic brain injury when endotracheal intubation is attempted by medics.*
Out-of-hospital endotracheal intubation and outcome after traumatic brain injury

Henry E. Wang MD, MPH, , Andrew B. Peitzman MD, Laura D. Cassidy PhD, P. David Adelson MD and Donald M. Yealy MD

From the Department of Emergency Medicine (Wang, Yealy), Department of Surgery (Peitzman), and Department of Neurosurgery (Adelson), University of Pittsburgh School of Medicine; and the Department of Biostatistics, University of Pittsburgh (Cassidy), Pittsburgh, PA.

Out-of-hospital (vs emergency department) ET intubation was associated with increased adjusted odds of:

**Death**

(3.99; 95% CI 3.21 to 4.93)

**Poor neurologic outcome**

(1.61; 95% CI 1.15 to 2.26)

**Moderate or severe functional impairment**

(FIS 6 to 15; OR 1.92; 95% CI 1.40 to 2.64)

**Severe functional impairment**

(FIS 11 to 15; OR 1.80; 95% CI 1.29 to 2.52)
Airway

The Endotracheal Tube may well largely go the way of the PASG/MAST in some instances

Though some patients will still require intubation
Airway

It may be appropriate that ET Intubation be de-emphasized in favor of a device that will provide ventilation following ease of insertion.

It is rather that “the appropriate airway management should be selected.”
15. **IF ETT Intubation is unsuccessful after ONE attempt, insert a Combitube.**

**ORAL ENDOTRACHEAL INTUBATION**

**Indications:**
1. Respiratory or cardiac arrest
2. Unconsciousness without a gag reflex
3. Decreased minute volume, due to decreased respiratory rate or volume
4. Possible airway obstruction
5. GCS ≤ 8

**Contraindications:**
1. None in the presence of hypoxia, unresponsive to ventilation, need for advanced airway or cardiopulmonary arrest

**Procedure:**
1. Preoxygenate the patient, if possible
2. Assemble and check equipment

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>The tip of curved blades should be placed in the vallecula while the tip of straight blades should be extended beyond the epiglottis.</td>
</tr>
<tr>
<td>7</td>
<td>Lift the epiglottis either directly or indirectly, visualizing the vocal cords.</td>
</tr>
<tr>
<td>8</td>
<td>Slip the endotracheal tube and stylet past the vocal cords about ½ to 1 inch. Gentle, downward pressure on the cricoid cartilage (Sellick’s maneuver) may assist.</td>
</tr>
<tr>
<td>9</td>
<td>While holding onto the tube, attempt and assess ventilations</td>
</tr>
<tr>
<td>10</td>
<td>If the chest rises and breath sounds are present, inflate the distal cuff with 5 to 10 ml of air</td>
</tr>
<tr>
<td>11</td>
<td>Confirm proper airway placement and assesses the quality of ventilations</td>
</tr>
<tr>
<td>12</td>
<td>Record capnographic change, breath sound locations and chest rise and fall</td>
</tr>
<tr>
<td>13</td>
<td>Secure tube with an endolock device</td>
</tr>
<tr>
<td>14</td>
<td>Continuously reassess breath sounds</td>
</tr>
<tr>
<td>15</td>
<td><strong>If ETT intubation is unsuccessful after <strong>one</strong> attempt, insert a Combitube.</strong></td>
</tr>
</tbody>
</table>
MedStar
ET Intubation Success Rates
2004 - 2006

Intubation Success Rate

% of Patients Successfully Inbutated  2 per. Mov. Avg. (% of Patients Successfully Inbutated)
**Advanced Airway Attempts**
**July 2005 – December 2006**

- Total Calls With Advanced Airway Attempted: 550 (7/05-3/06), 493 (4/06-12/06)
- Total ETT Attempts: 531 (7/05-3/06), 451 (4/06-12/06)
- Patients With Combitubes Attempted: 72 (7/05-3/06), 138 (4/06-12/06)
- Combitube Attempted First: 19 (7/05-3/06), 42 (4/06-12/06)
- Total Number of Patients w/o Definite Airway: 39 (7/05-3/06), 27 (4/06-12/06)
Of 61 factors potentially related to ETI failure, multivariate logistic regression revealed the following significant covariates associated with ETI failure (odds ratio; 95% confidence interval; likelihood ratio p-value):

- **Presence of clenched jaw/trismus**
  - (9.718; 95% CI = 4.594 to 20.558; p < 0.0001);

- **Inability to pass the endotracheal tube through the vocal cords**
  - (7.653; 95% CI = 3.561 to 16.447; p < 0.0001);

- **Inability to visualize the vocal cords**
  - (7.638; 95% CI = 3.966 to 14.707; p < 0.0001);

- **Intact gag reflex**
  - (7.060; 95% CI = 3.552 to 14.033; p < 0.0001);

- **Intravenous access established prior to ETI attempt**
  - (3.180; 95% CI = 1.640 to 6.164; p = 0.0005);

- **Increased weight (ordinal scale)**
  - (1.555; 95% CI = 1.242 to 1.947; p = 0.0001);

- **Electrocardiographic monitoring established prior to ETI attempt**
  - (0.199; 95% CI = 0.084 to 0.469; p = 0.0003).
Airway

The “Rescue Airway”??

Figure 1. Image of the Laryngeal Tube (VBM Medizintechnik GmbH, Sulz, Germany).

Figure 2. Placement of the Laryngeal Tube (VBM Medizintechnik GmbH, Sulz, Germany).
The airway of the future will be what the patient needs, not just some standard approach to all problems.
Airway

Let’s intubate the trachea only when we need to intubate the trachea
What I Believe…

Airway

The Primary Airway – BVM
The Secondary Airway – King, Combi, etc
The Tertiary Airway – ET Intubation
Intubation will still be needed for:

- Laryngeal issues
- Upper airway bleeding
- Vomiting prophylaxis (probably)
Complications associated with the Esophageal-Tracheal Combitube® in the pre-hospital setting

[Complications associées avec l'utilisation du Combitube dans la prise en charge des arrêts cardio-respiratoires en préhospitalier]

Marie-Claude Vézina MD, Claude A. Trépanier MD FRCPC, Pierre C. Nicole MD FRCPC, Martin R. Lessard MD FRCPC

Purpose: The Esophageal-Tracheal Combitube® (Combitube) is widely used for the management of the airway during cardiopulmonary resuscitation in the pre-hospital setting. Although serious complications have been reported with the Combitube, there is a paucity of data relative to the frequency and nature of such complications. The objective of this retrospective study was to determine the incidence and nature of complications associated with the Combitube in the pre-hospital setting.

Methods: Since 1993, in the Quebec City Health Region, the basic life support treatment algorithm for emergency medical technicians has included the use of a Combitube as the primary airway device for management of all patients presenting with cardiac or respiratory arrest. The database of the emergency coordination services was searched for the period between 1993 and 2003 (2,981 patients). Only those patients who survived at least 12 hr were included. Medical records of these patients were reviewed to identify complications related to the use of the Combitube.


Méthode : Depuis 1993, le protocole de prise en charge préhospitalière de l’Agence régionale de santé de Québec inclut l’insertion d’un Combitube par les techniciens ambulanciers pour le contrôle initial des voies aériennes des patients en arrêt cardiaque ou respiratoire. Une recherche dans le registre de la centrale de coordination des ressources a été faite et à terme d’identifier 2,981 patients pour...
### TABLE I  Emergency airway – related complications

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspiration pneumonia</td>
<td>31</td>
</tr>
<tr>
<td>Pulmonary aspiration</td>
<td>16</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>6</td>
</tr>
<tr>
<td>Upper airway bleeding</td>
<td>4</td>
</tr>
<tr>
<td>Esophageal laceration</td>
<td>3</td>
</tr>
<tr>
<td>Subcutaneous emphysema</td>
<td>2</td>
</tr>
<tr>
<td>Esophageal perforation and mediastinitis</td>
<td>2</td>
</tr>
<tr>
<td>Tongue edema</td>
<td>2</td>
</tr>
<tr>
<td>Vocal cord injury</td>
<td>1</td>
</tr>
<tr>
<td>Tracheal injury</td>
<td>1</td>
</tr>
<tr>
<td>Pneumomediastinum</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>69</strong></td>
</tr>
</tbody>
</table>

A total of 69 airway-related complications were observed in 58 of 282 patients whose airways were managed by a Combitube® in the pre-hospital setting. The specific complications and their numbers are shown.

### TABLE II  Complications most likely related to Combitube® insertion

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper airway bleeding</td>
<td>4</td>
</tr>
<tr>
<td>Esophageal laceration</td>
<td>3</td>
</tr>
<tr>
<td>Esophageal perforation and mediastinitis</td>
<td>2</td>
</tr>
<tr>
<td>Tongue edema</td>
<td>2</td>
</tr>
<tr>
<td>Vocal cord injury</td>
<td>1</td>
</tr>
<tr>
<td>Tracheal injury</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>13</strong></td>
</tr>
</tbody>
</table>

Thirteen complications presenting in 12 patients, considered as most likely resulting from Combitube® insertion.
What are the problems?

1. The Unprepped Airway
2. Never got good initial training
3. Deteriorating Skills
4. Patient Criticality
5. The Physiology of the Positioning of the Head
How do we find providers who can manage such a condition?

Especially if they never had any OR training under the guidance of a skilled intubator?

Is mannequin training enough?
#8. Intrathoracic Pressure
Breathing

The Negative Space Concept

• Normal breathing sucks air into the chest
• Positive pressure ventilation decreases cardiac output
Central Pumping Concept

- Negative pressure venous return: "Straw"
- Cardiac Output tied strictly to venous return
- Alterations in return affect output
The negative pressure inside the thorax “pulls” blood back from the positive pressure areas.

Positive pressure

Negative pressure

Positive pressure
Maintaining the “negativity” of the pressure inside of the thorax is one of the most vital areas of understanding resuscitation.
Blood pressure = Cardiac output \times Volume \times Peripheral resistance
Blood pressure =

A heart thing &
a volume thing &
a blood vessel thing…ALWAYS!
What does a low blood pressure mean?

Either...

Or a combination of any of these

...from “Shock Evaluation and Management” in BTLS editions 2, 3, 4, 5, and 6 by Fowler et al
Positive Pressure in the Thorax decreases Venous Return!!
We have to avoid raising intrathoracic pressure in shock states
During cardiac arrest, venous return is nearly lost
If nothing is coming back, nothing is going out!
National Institutes of Health

Resuscitation Outcomes Consortium
Resuscitation Outcomes Consortium

Will utilize the “ResQ Pod” (impedance threshold device) to try to improve outcome from cardiac arrest
A tool for restoring life
#7. Avoiding Overventilation
It turns out that the cerebral vasoconstrictive response to hyperventilation is lost in hemorrhagic shock anyway!
We’re using 7.5% hypertonic saline to prevent the traumatized brain from swelling at all, rather than having to treat the swelling later.
So, why would we bag the patient any faster if no more oxygen is needed than a “one hand squeeze every eight seconds”??
...which is what you are breathing right now as you are sitting there listening to this stuff...
Breathing the patient too fast INCREASES pressure inside the chest!
The increased pressure inside the chest is directly transmitted to the intracranial space.
Do **NOT** use Two-handed Squeezes on the bags!
...as you see here...
don’t do this!!!
Generally speaking:

The patient in circulatory collapse suffers greatly from positive pressure ventilation used by rescuers.
We must judge our ventilation rates and tidal volumes.

...it is now the standard...
Otherwise we’ll eat your liver with fava beans and a nice chianti
#6. Capnography
Physiology

**Oxygen** -> lungs -> alveoli -> blood

- **breath**
- **CO₂**
- **lungs**
- **blood**

**CO₂**

**Oxygen**

- **muscles + organs**
- **cells**

**energy**

**Oxygen + Glucose**
Capnography

- Is the airway in, and does it stay in?

- What is the shape of the curve?

- What is the absolute height of the curve?
The Little Old Man
Old Joe and Sweet Sue
Respirations vs. Capnography

\[ y = -0.2947x + 41.906 \]
Capnography

Measuring CO2 to validate the airway is the standard of care.

Educators understanding AND being able to explain capnography is the “educational standard of care”
Capnometry

- A (purple) = < 4 mm Hg
- B (tan) = 4-15 mm Hg
- C (yellow) = > 15 mm Hg
State of Pennsylvania
INTERESTING THOUGHT!

Medics (any rescuer) seem to take a “cue” for WHEN to bag again by the recoil of the bag touching the rescuer’s hand.
Decreasing peak flow rate with a new bag-valve-mask device: effects on respiratory mechanics, and gas distribution in a bench model of an unprotected airway

Horst G. Wagner-Berger\textsuperscript{a,*}, Volker Wenzel\textsuperscript{a}, Angelika Stallinger\textsuperscript{a}, Wolfgang G. Voelckel\textsuperscript{a}, Klaus Rheinberger\textsuperscript{a}, Karl H. Stadlbauer\textsuperscript{a}, Sven Augenstein\textsuperscript{a}, Volker Dörges\textsuperscript{b}, Karl H. Lindner\textsuperscript{a}, Christoph Hörmann\textsuperscript{a}

\textsuperscript{a} Department of Anaesthesiology and Critical Care Medicine, Leopold-Franzens-University, Anichstrasse 35, 6020 Innsbruck, Austria
\textsuperscript{b} Department of Anaesthesiology, University of Kiel, Kiel, Germany

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Respiratory Distress and Failure

Effectiveness of Prehospital CPAP in Managing Acute Pulmonary Edema

By Keith Wesley

Editor's Note: CPAP in pulmonary edema will be the clinical focus of November JEMS.

Continuous Positive Airway Pressure
Continuous Positive Airway Pressure

Boussignac CPAP works the same way as the turbines of a jet engine.

- Oxygen supply: $\text{O}_2$ molecules enter the chamber.
- Oxygen acceleration: The $\text{O}_2$ molecules are accelerated at the speed of sound as they pass through microchannels.
- Oxygen braking: The $\text{O}_2$ molecules strike a deflector, which sends them back to the central (mixing) zone.
- Establishment of a virtual valve: The collision of molecules generates turbulence, which transforms speed into pressure.

PATIENT

COURTESY VTIAID LTD.
#5. Intraosseous Infusion

On of the most important advances in the history of EMS
Intraosseous Infusion
Intraosseous Infusion

Central Line Alternative

Currently, when IV insertion is challenging in the emergency room or hospital setting, a physician's first instinct is to place a central line. However, according to new American Heart Association ACLS guidelines as well as numerous studies, adult IO infusion provides venous access similar to that achieved by central lines faster, with less expense and lower complication rates. Additionally, throughout the ACLS protocols and algorithms, IO is paired with IV access and is recommended over central lines and ET tube drug administration for cases of cardiac arrest.
Potential access sites:

- Proximal tibia
- Humeral head
- Distal tibia
So, we can now get vascular access on almost anybody …at a price, though…

...consider both initial and recurring cost...
#4. Shock Treatment
Shock

Cardiogenic
- Rapid pulse
- Distended neck veins
- Cyanosis

Volume Loss
- Rapid pulse
- Flat neck veins
- Pale

Vasodilatory
- Variable pulse
- Flat neck veins
- Pale or pink
Signs of Shock

**Early**
- Weak, thirsty, lightheaded
- Pale, then sweaty
- Tachycardia
- Tachypnea
- Diminished urinary output

**Late**
- Hypotension
- Altered LOC
- Cardiac arrest
- Death
Hemorrhagic Shock

A flat neck vein, tachycardia shock

Signs of poor perfusion, pale, diaphoretic

REDUCED End-tidal CO$_2$ in the setting of normal PO$_2$

Decreased urinary output (normally 30 cc/hr or more, especially with IV fluids)
ASSUMPTION

Elevating Blood Pressure is Always a Good Thing
Maybe
Not...
Bill Bickell and Paul Pepe
More On-Scene Time...

...and Increased BP
If you wait too long, irreversible shock occurs because of arteriole and heart damage.
Rationale for Fluid Resuscitation

Series of Canine Experiments in 1950s and 1960s...

Shed 60-70% blood volume = 80% Mortality Rate
1990’s -- New Series of Animal Experiments

(uncontrolled hemorrhage in rats, dogs, pigs, sheep)

BP < 40 mmHg
May Be a Hypotension Threshold
A number of fluids have been tried...
Hemoglobin-based Oxygen Carriers (HBOC)
### Table 1
HBOC Physical Properties (adapted from ref. 28)

<table>
<thead>
<tr>
<th>HBOC</th>
<th>Poly-SFH-P Polyheme</th>
<th>HBOC 201 Hemopure</th>
<th>o-raftiner cross-linked hgb Hemolink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tradename</td>
<td>Manufacturer</td>
<td>Polyheme</td>
<td>Hemopure</td>
</tr>
<tr>
<td></td>
<td>Northfield</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Laboratories Inc.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hemoglobin Source</td>
<td>Human</td>
<td>Bovine</td>
<td>Human</td>
</tr>
<tr>
<td>Polymerizer</td>
<td>gluteraldehyde</td>
<td>gluteraldehyde</td>
<td>o-raftinose</td>
</tr>
<tr>
<td>Hemoglobin (g/dL)</td>
<td>10</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Unit Volume (mL)</td>
<td>500</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Hemoglobin (g) per Unit</td>
<td>50</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>P50 (mmHg)</td>
<td>28-32</td>
<td>38</td>
<td>39+/−12</td>
</tr>
<tr>
<td>Colloid Osmotic Pressure (mm Hg)</td>
<td>20-25</td>
<td>17</td>
<td>26+/−4</td>
</tr>
<tr>
<td>Osmolarity(mOsm)</td>
<td>290-310</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viscosity (cp)</td>
<td>1.9-2.2</td>
<td>1.3</td>
<td>1−2</td>
</tr>
<tr>
<td>Tetramer % (&lt; 64 kD)</td>
<td>&lt;1</td>
<td>&lt;5</td>
<td>&lt;66</td>
</tr>
<tr>
<td>Methemoglobin %</td>
<td>&lt;8%</td>
<td>&lt;10%</td>
<td>&lt;15</td>
</tr>
<tr>
<td>Shelf Life</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4°C</td>
<td>&gt;6 weeks</td>
<td>&gt;3 years</td>
<td>&gt;1 year</td>
</tr>
<tr>
<td>21°C</td>
<td>&gt;1.5 years</td>
<td>&gt;2 years</td>
<td></td>
</tr>
</tbody>
</table>
Recent HBOC-201 Data

- Pigs Bled to > 40% Blood Volume
- LR vs Hgb to MAP = 60 mm Hg
- Survival = 1 of 10 vs 7 of 7
- Hct < 1% = 9 of 10 & 6 of 7
EMS Needs:

- Portable
- Temperature stable
- Ideally NOT requiring refrigeration
- Cheap!
SO!!!

Why not just put it in the water?
Make it part of the LAST DRINK at a bar?
Put it next to "Crystal Light" at the grocery store?
Shocking Revelations!!

The Use of Low Volume Resuscitation in the Treatment of Hemorrhagic Shock
We have over ten quarts of fluid in the body that can be pulled into the blood system.
Some More Basics

Zzzzzzzzz
Let's look at some of these figures again.

<table>
<thead>
<tr>
<th>Body Fluid Compartments</th>
<th>Total Body Water (%)</th>
<th>Body Weight (%)</th>
<th>Total Body Water (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intravascular</td>
<td>5</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Interstitial</td>
<td>15</td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

15% x 70KG = 10KG (about 10 liters)!!!
An average adult has ten liters of free fluid (over two gallons) bathing the cells and potentially available to be pulled back into the blood vessels to maintain blood pressure.
Fluid that is sterile, that has normal electrolytes, and has MUCH less effect on diluting clotting factors, and is not “pro-inflammatory”
We Shift Fluid from the Extracellular Spaces…

… that Bathe the Cells in Oxygen
You might say, every patient has the ability to act as a reservoir of “internal IV fluids”
Giving a concentrated solution of salt water (hypertonic saline) can pull this fluid back into the blood vessels.

<table>
<thead>
<tr>
<th>Body Fluid Compartments</th>
<th>Total Body Water</th>
<th>Body Weight (%)</th>
<th>Total Body Water (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td>60</td>
<td>100</td>
</tr>
<tr>
<td>Intracellular</td>
<td></td>
<td>40</td>
<td>67</td>
</tr>
<tr>
<td>Extracellular</td>
<td></td>
<td>20</td>
<td>33</td>
</tr>
<tr>
<td>Intravascular</td>
<td></td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Interstitial</td>
<td></td>
<td>15</td>
<td>25</td>
</tr>
</tbody>
</table>
Hypertonic saline has been shown to be safe and effective and to have beneficial effects during resuscitation.
Hypertonic Saline

1. Slaper GT, Brouwer LF, Stegeman DF, Williams SJ, Browder TD, Barber AE.
   The effect of shock resuscitation fluids on apoptosis.

2. Chen H, Incoccio R, Adam HB, Rhee P, Konttura E.
   Differential expression of extracellular matrix remodeling genes in rat model of hemorrhagic shock and resuscitation.

3. Prower KA, Zarebinska J, Szczygiel KD, Khadraee RG, Kropi S, Rotzen OD.
   Hypertonic resuscitation of hemorrhagic shock prevents alveolar macrophage activation by preventing systemic oxidative stress due to gut ischemia/reperfusion.

4. Li HG, Ou ZY, Si ZZ, Li YM, Liu XJ, Wang HQ, Jin SQ.
   [Effects of hypertonic saline on erythrocyte adherence function and bacterial infection of hemorrhagic shock rabbits]
   PMID: 15355454 [PubMed - in process]

5. Carrera RN, Pacheco AM Jr, Campa J, Nastreri RA.
   Intraosseous hypertonic saline solution for resuscitation of uncontrolled, exsanguinating liver injury in young swine.

   The early systemic and gastrointestinal oxygenation effects of hemorrhagic shock resuscitation with hypertonic saline and hypertonic saline 6% dextran-70: a comparison.

7. Romney S.
   Small-volume resuscitation with 7.5% hypertonic saline solution—treatment of hemorrhagic shock in the tropics.
   PMID: 15287061 [PubMed - indexed for MEDLINE]
Hypertonic Saline

- Already recommended therapy in 2004 Emergency War Surgery
- Uses the body’s 10 liters of interstitial fluid to maintain perfusion
- Help prevent brain edema
- Anti-inflammatory
National Institutes of Health
Resuscitation Outcomes Consortium
For Hemorrhagic Shock due to Trauma
We are giving either 250 cc (about a cup) of Hypertonic Saline plus Standard Fluids or Standard IV Fluids Only.
Initially we poured in fluid...

Then it was “permissive hypoperfusion”...

Now we’ll be using the body’s own “internal IV fluids”
Stay Tuned!

We’re a year away!!
#3. Statewide Protocols
Many states have now taken an important step: A Single, state-wide protocol set from which no deviations are allowed.
PATIENT CARE PROTOCOLS
Patient Care Protocols

SECTION 3: Medical Direction for Drugs and Procedures (continued)

SECTION 3.2 MEDICAL DIRECTION HOSPITALS
Medical direction must be provided by a medical direction hospital. Medical direction hospitals are defined as those hospitals that provide OLMD by physicians with current medical control physician certification and medical control physician identification number. Hospitals that do not provide OLMD are referred to as non-medical direction hospitals. Medical direction hospitals shall provide OLMD for all patients being transported to their facility. All medical direction for patients transported to non-medical direction hospitals must come from a medical direction hospital as outlined in the Regional Medical Control Plan.

SECTION 3.3 PHYSICIAN MEDICAL DIRECTION
Medical direction for drugs and patient care procedures is provided under physician oversight. To provide on-line medical direction a physician must have taken the medical control course and hold a current medical control physician identification number. There are a few special situations where medications can be given and/or procedures performed without direct physician contact as long as the patient is stable. Examples are oxygen therapy, precautionary IVs, and administration of D50W for hypoglycemia. In such cases only a report to a nurse at the receiving hospital is necessary. Most drugs and procedures, however, require contact with a physician either prior to, or after, administration.

SECTION 3.4 DRUG AND PROCEDURE CATEGORIES

Category A (CAT A): A drug or procedure that requires the EMT to contact OLMD after administration.

Category B (CAT B): A drug or procedure that requires the EMT to contact OLMD prior to administration.

Category A: Drugs or procedures which may be used by the EMT in accordance with the protocols with contact to the medical direction physician after the drug/procedure is used as directed by the protocols.

<table>
<thead>
<tr>
<th>DRUG/PROCEDURE</th>
<th>PROTOCOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albuterol</td>
<td>Respiratory Distress</td>
</tr>
<tr>
<td>Albuterol</td>
<td>Allergic Reaction</td>
</tr>
<tr>
<td>Atropine Sulfate</td>
<td>Cardiac Arrest</td>
</tr>
<tr>
<td>Atropine Sulfate</td>
<td>Symptomatic Bradycardia</td>
</tr>
<tr>
<td>D50</td>
<td>Altered Mental Status</td>
</tr>
<tr>
<td>D50</td>
<td>Cardiac Arrest</td>
</tr>
<tr>
<td>D50</td>
<td>Coma</td>
</tr>
<tr>
<td>D50</td>
<td>Seizures</td>
</tr>
<tr>
<td>Diazepam</td>
<td>Seizures (Adult)</td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>Allergic Reaction</td>
</tr>
<tr>
<td>Epinephrine</td>
<td>Allergic Reaction</td>
</tr>
<tr>
<td>Epinephrine</td>
<td>Cardiac Arrest</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>Cardiac Arrest</td>
</tr>
</tbody>
</table>
### Patient Care Protocols

**SECTION 3: Medical Direction for Drugs and Procedures (continued)**

#### Category A (continued)

<table>
<thead>
<tr>
<th>DRUG/PROCEDURE</th>
<th>PROTOCOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lorazepam</td>
<td>Seizures</td>
</tr>
<tr>
<td>Naloxone</td>
<td>Altered Mental Status</td>
</tr>
<tr>
<td>Naloxone</td>
<td>Cardiac Arrest</td>
</tr>
<tr>
<td>Naloxone</td>
<td>Coma</td>
</tr>
<tr>
<td>Naloxone</td>
<td>Poisons &amp; Overdoses</td>
</tr>
<tr>
<td>Naloxone</td>
<td>Seizures</td>
</tr>
<tr>
<td>Nitroglycerin</td>
<td>Cardiac Chest Pain</td>
</tr>
<tr>
<td>Normal Saline (IV Solution)</td>
<td>All Protocols as indicated</td>
</tr>
<tr>
<td>Oral intubation</td>
<td>All Protocols as indicated</td>
</tr>
<tr>
<td>Thiamine</td>
<td>All Protocols as indicated</td>
</tr>
<tr>
<td>Vasopressin</td>
<td>Adult Vfib/Pulseless Vtach</td>
</tr>
</tbody>
</table>

#### Category B: Drugs or procedures which may be used by the EMT in accordance with the protocols with contact to the medical direction physician PRIOR TO the drug/procedure being used as directed by the protocols.

<table>
<thead>
<tr>
<th>DRUG/PROCEDURE</th>
<th>PROTOCOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activated Charcoal</td>
<td>Poisons &amp; Overdoses</td>
</tr>
<tr>
<td>Adenosine</td>
<td>Cardiac Dysrhythmias</td>
</tr>
<tr>
<td>Albuterol</td>
<td>Congestive Heart Failure</td>
</tr>
<tr>
<td>Albuterol</td>
<td>Burns with wheezing</td>
</tr>
<tr>
<td>Atropine Sulfate</td>
<td>Poisons &amp; Overdoses</td>
</tr>
<tr>
<td>Calcium Gluconate</td>
<td>Cardiac Arrest</td>
</tr>
<tr>
<td>Calcium Gluconate</td>
<td>Poisons &amp; Overdoses</td>
</tr>
<tr>
<td>Dextrose</td>
<td>Hyperthermia</td>
</tr>
<tr>
<td>Dextrose</td>
<td>Poisons &amp; Overdoses</td>
</tr>
<tr>
<td>Diazepam</td>
<td>Seizures (Pediatric)</td>
</tr>
<tr>
<td>Diazepam</td>
<td>Seizures (Rectal Administration)</td>
</tr>
<tr>
<td>Dopamine</td>
<td>Cardiac Arrest</td>
</tr>
<tr>
<td>Dopamine</td>
<td>Poisons &amp; Overdoses</td>
</tr>
<tr>
<td>Dopamine</td>
<td>Shock</td>
</tr>
<tr>
<td>Epinephrine</td>
<td>Respiratory Distress</td>
</tr>
<tr>
<td>Furosemide</td>
<td>Respiratory Distress</td>
</tr>
<tr>
<td>Glucagon</td>
<td>Hypoglycemia</td>
</tr>
<tr>
<td>Glucacon</td>
<td>Poisons &amp; Overdoses</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>Cardiac Chest Pain</td>
</tr>
<tr>
<td>Lidocaine</td>
<td>Cardiac Dysrhythmias</td>
</tr>
<tr>
<td>Lorazepam</td>
<td>Seizures (Pediatric)</td>
</tr>
<tr>
<td>Magnesium Sulfate</td>
<td>Preecclampsia/Eclampsia</td>
</tr>
<tr>
<td>Magnesium Sulfate</td>
<td>Cardiac Dysrhythmias (Torsades de Pointes)</td>
</tr>
<tr>
<td>Morphine Sulfate</td>
<td>All Protocols as indicated</td>
</tr>
<tr>
<td>Nitroglycerin</td>
<td>Congestive Heart Failure</td>
</tr>
<tr>
<td>Nitroglycerin</td>
<td>Hypertensive Emergencies</td>
</tr>
<tr>
<td>Nitroglycerin</td>
<td>Respiratory Distress</td>
</tr>
<tr>
<td>Nitrous Oxide</td>
<td>Amputation, Burns, Cardiac Chest Pain, Fractures and Dislocations</td>
</tr>
<tr>
<td>Sodium Bicarbonate</td>
<td>Cardiac Arrest</td>
</tr>
<tr>
<td>Sodium Bicarbonate</td>
<td>Poisons &amp; Overdoses</td>
</tr>
</tbody>
</table>
Patient Care Protocols
SECTION 3: Medical Direction for Drugs and Procedures (continued)

<table>
<thead>
<tr>
<th>Drug</th>
<th>WHEN TO USE</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amiodarone</td>
<td>Adult/Pediatric VFib/Pulseless VTach</td>
<td></td>
</tr>
<tr>
<td>Glucagon</td>
<td>Hypoglycemia</td>
<td></td>
</tr>
<tr>
<td>Glucagon</td>
<td>Poisons and Overdoses</td>
<td></td>
</tr>
<tr>
<td>Lorazepam</td>
<td>Seizures</td>
<td></td>
</tr>
<tr>
<td>Nitrous Oxide</td>
<td>Amputation</td>
<td></td>
</tr>
<tr>
<td>Nitrous Oxide</td>
<td>Burns</td>
<td></td>
</tr>
<tr>
<td>Nitrous Oxide</td>
<td>Cardiac Chest Pain</td>
<td></td>
</tr>
<tr>
<td>Nitrous Oxide</td>
<td>Fractures &amp; Dislocations</td>
<td></td>
</tr>
<tr>
<td>Morphine Sulfate</td>
<td>All Protocols as indicated</td>
<td>Required if Available</td>
</tr>
<tr>
<td>Vasopressin</td>
<td>Adult VFib/Pulseless VTach</td>
<td></td>
</tr>
</tbody>
</table>

SECTION 3.5 OPTIONAL DRUGS AND PROCEDURES

Licensed services are required to carry and provide most of the drugs and equipment necessary to perform patient care procedures as directed by the protocols. However, optional drugs and procedures are NOT required and medical directors have the option to make all, some, or none required for his/her particular service.

The Optional drugs are listed below and are considered either Category A or Category B as directed by the protocols and listed in the Category A and Category B tables.

<table>
<thead>
<tr>
<th>PROCEDURES</th>
<th>WHEN TO USE</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Lead EKG</td>
<td>Chest Pain and/or Chest Trauma</td>
<td>Required if Available</td>
</tr>
<tr>
<td>End-Tidal <strong>Electronic</strong> CO₂ monitoring</td>
<td>Intubated patient, respiratory problem, trauma patient</td>
<td>May replace colormetric CO₂ detector in monitoring ET tube placement (use of one or the other is mandatory)</td>
</tr>
<tr>
<td>Portable ventilator</td>
<td>Intubated patient and/or when following manufacturer's recommendations</td>
<td></td>
</tr>
</tbody>
</table>
ABDOMINAL PAIN

4.3

SPECIFIC INFORMATION NEEDED:
A. Pain: PQRST – Place, Quality, Radiation, Severity, Time began.
B. Associated symptoms: Nausea, vomit (bloody or coffee-ground) diarrhea, constipation, melena, urinary difficulties, menstrual history, fever.
C. History: Previous trauma, abnormal ingestion, medications, known disease, surgery, pregnant or missed periods.

PHYSICAL ASSESSMENT:
A. Vital signs.
B. Abdomen: Tenderness, rebound tenderness, guarding, rigidity, bowel sounds, distension, pulsating mass.
C. Emesis: Type, amount, (save and transport with patient if possible).
D. Note any evidence of blood in emesis or of rectal blood.

TREATMENT:
A. Airway - ensure patency (vomiting precautions).
B. Breathing - Oxygen to maintain saturation (pulse oximeter) of > 95%.
C. Circulation - obtain vital signs frequently, (monitor for shock)
   * Consider IV, Saline lock or large bore, normal saline, TKO.
   * If shock syndrome present, proceed to Shock Protocol.
D. Position of comfort.
E. Give nothing by mouth.
F. Reassess patient and obtain vital signs frequently.
G. Consider Morphine Sulfate for patients with severe pain as seen with kidney stones.
   Adult (CAT B): 2-5 mg IV
   Pediatric (CAT B): 0.1 mg/kg not to exceed 5 mg

SPECIFIC PRECAUTIONS:
A. Abdominal pain may be the first warning of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, ectopic pregnancy, perforated viscus, etc.). Since the bleeding is not apparent, you must think of volume depletion and monitor patient closely to recognize shock.
B. Use caution with fluid administration in patients with suspected dissecting aortic or abdominal aneurysm. Do not try to exceed systolic BP of 90 torr.
C. Nitrous Oxide causes bowel distention and is contraindicated in abdominal pain.
LIDOCAINE

PHARMACOLOGY AND ACTIONS:
A. Depresses automaticity of Purkinje fibers; therefore, raises stimulation threshold in the ventricular muscle fibers (makes ventricles less likely to fibrillate).
B. CNS stimulation: tremor, restlessness and clonic convulsions followed by depression and respiratory failure at higher doses.
C. Cardiovascular effect: decreased conduction rate and force of contraction, mainly at toxic levels.
D. The effect of a single bolus on the heart disappears in 10-20 minutes due to redistribution in the body. Metabolic half-life is about 2 hours and, therefore, toxicity develops with repeated doses.

INDICATIONS:
A. PVCs in a suspected ischemic event.
B. Stable ventricular tachycardia or recurrent ventricular tachycardia if clinical condition is not rapidly deteriorating.
C. Ventricular fibrillation or pulseless ventricular tachycardia that persists after defibrillation.
D. Following successful defibrillation or cardioversion for ventricular tachycardia.

CONTRAINDICATIONS:
Heart rate less than 60.

PRECAUTIONS:
A. Advanced AV block/unless artificial pacemaker is in place.
B. In atrial fibrillation or flutter, quinidine like effect may cause alarming ventricular acceleration.
C. Diazepam should be available to treat convulsions if they occur.
D. Lidocaine should NOT be given, except in cardiac arrest, without direct physician orders if
   1. Heart rate is less than 60 min. OR
   2. Periods of sinus arrest or any A-V block are present.
E. Drug is metabolized in the liver and, therefore, patients with hepatic disease, shock or congestive heart failure will have impaired metabolism. All Lidocaine doses (excluding loading doses) should be reduced by 50% in presence of decreased cardiac output (congestive heart failure, hypotension), hepatic dysfunction, or age more than 70. This rule does NOT apply to patients in cardiac arrest.

ADMINISTRATION (CAT A for cardiac arrest, CAT B all other administration):
Adult Cardiac Arrest (VFib or Pulseless VTach)-
Lidocaine bolus: 1.5 mg/kg initial dose, may repeat with 0.75mg/kg every 5 minutes to total dose of 7mg/kg. Only bolus therapy should be used in the cardiac arrest setting (should the arrest be followed by successful resuscitation, a continuous infusion should be initiated at 2-4mg/min).

Pediatric Cardiac Arrest (VFib or Pulseless VTach)-
1.0 mg/kg, IVP/IO
Fulton County Emergency Medical Services
Clinical Care Guidelines
Fulton County Emergency Medical Services
Clinical Care Guideline – A10
Prehospital Acuity Classification
03/01/2001

Prehospital Acuity Classification (PAC)

1) The PAC System is designed to aid prehospital providers in classifying patients for referral of care, destination and hospital diversion decisions. Prehospital providers should use these guidelines and their clinical instincts to place patients into one of these categories. The categories below contain specific examples of conditions or presentations that typically place a patient in a particular category, but should not be considered an exclusive list that takes into account every patient presentation or prehospital situation:

a) Immediate Threat to Life – PAC Level One
b) Time Dependent Emergency – PAC Level Two
c) Potential Emergency / Urgency – PAC Level Three

2) Patients that have vital signs outside of the normal range, but have no other evidence of a life threatening or time dependent emergency may be categorized as PAC Level 2 or Level 3 based on the clinical judgment of the on-scene provider.

Immediate Threat to Life
- Acute injury management required (ETT, NTAD, CP Airway, BVM)
- Severe respiratory distress with SpO2 < 90%
- Trauma
  - Systolic BP < 90 mmHg
  - Arterial change in maternal infant
    - GCS < 14
  - P or U on the AVPU Scale

Time Dependent Emergency
- New onset CVA
- Chest pain with EKG orhistory consistent with MI
- New onset confusion or disorientation
- Severe pain managed by prehospital intervention
- Patient condition not improving or deteriorating despite prehospital intervention
  - Respiratory distress
  - Allergic reaction
  - Hypoglycemia
  - Gastro pain

Vital Signs Outside of Normal Range

<table>
<thead>
<tr>
<th>Age</th>
<th>RR</th>
<th>HR</th>
<th>SpO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 m</td>
<td>30</td>
<td>&gt; 120</td>
<td>&gt; 95%</td>
</tr>
<tr>
<td>3 m to 3 y</td>
<td>&gt; 40</td>
<td>&gt; 160</td>
<td>&gt; 95%</td>
</tr>
<tr>
<td>3 - 8 y</td>
<td>&gt; 30</td>
<td>&gt; 140</td>
<td>&gt; 92%</td>
</tr>
<tr>
<td>&gt; 8 y</td>
<td>&gt; 20</td>
<td>&gt; 120</td>
<td>&gt; 92%</td>
</tr>
</tbody>
</table>

With Concerning Clinical Presentation

Potential Emergency / Urgency
- A threat to life or time dependent emergency is not identified
This is an important step forward in EMS...

One whose time has come in Georgia
#2. Recruitment and Retention
Most experts agree that there appears to be a national trend toward decreasing volunteerism and an increase in EMS personnel seeking paid careers.
Which
is
perfectly
reasonable
Emergency Medical Services (EMS) companies throughout Pennsylvania are severely understaffed, some dangerously close to not being able to quickly respond to 9-1-1 calls!!!
Unit Hour Utilization vs. Unfilled Shifts

Medstar, FW, TX, 0707
The Minnesota Study

http://www.health.state.mn.us/divs/chs/rhpc/cah/rasstudy.htm
59% volunteers
25% are full-time paid
BLS avg 20, mostly volunteer
ALS avg 39, ¾ paid
Rural 77% volunteer
Urban 54% paid

2/3 medics male
41% female in rural EMS
20% female in urban #MS
18 – 70+ years
Most 20 – 50
Rural more likely >40 yo
Paid staff less time on job
Rural staff more time on job
Recruitment and Retention of Personnel:
State of Minnesota, 2001 to present

EMTs and paramedics were asked why they volunteer, how they view their work, as well as future involvement:

* 36 percent wanted to help people or their community
* 32 percent expressed a previous or current interest in medicine.
* A sense of community pride and civic responsibility were clear.
* Ninety-one percent of case study respondents agreed that being on the ambulance service was a good use of their time.
Recruitment and Retention of Personnel:  
State of Minnesota, 2001 to present  

Barriers to Recruitment and Retention  

* Nature of the work  
* Changing demographics  
* Selective volunteerism  
* “Invisibility” (the effects of HIPAA)  
* Time and training demands (Initial and CE)  
* Ongoing training (“too much”)  
* High stress and menial tasks  
* Fear of errors  
* The need for high quality Medical Direction  
* Employment concerns  
* Compensation (no pay to $20/run to $12/hour)  
* Retirement
Recruitment and Retention of Personnel:
State of Minnesota, 2001 to present

Quality of Ambulances / Facilities

* Air Quality
* Training facilities
* Sleeping quarters
* Hazards
Recruitment and Retention of Personnel: State of Minnesota, 2001 to present

Hazards

* Methamphetamine labs
* Blood borne pathogens
* Lack of protective clothing and equipment
* “Antique” PPE
* Chemicals carried by trucks and trains
3. **August 07, Monterey County—Herald (CA) — Gas line puncture forces evacuation.** A construction crew trying to replace a power pole Monday, August 6, in Salinas, CA, instead struck a gas line that forced the evacuation of residents from a nearby apartment complex. A three-person crew from Baron Construction of Atascadero punctured the three-inch gas line when a worker tried to drill a hole to replace the pole near 16 Natividad Road. Officers knocked on the doors of about 15 apartments to evacuate the residents while the gas spewed. Homes on Natividad between Bernal and Sorentini drives were also evacuated. Traffic in the area of Natividad Road was diverted to other streets while PG&E fixed the leak. Source: [http://www.montereyherald.com/local/ci_6562074?nclck_check=1](http://www.montereyherald.com/local/ci_6562074?nclck_check=1)

4. **August 06, KULR—8 TV (MT) — Chemical fire causes evacuations.** A truck carrying hazardous material prompted an evacuation Monday, August 6, in downtown Billings, MT. The Billings Fire Department says a truck carrying the highly flammable chemical xylene caught fire. That fire was put out, but not before many residents were forced to leave their homes. The evacuation was done by using a reverse 911 method. Any structure within a quarter mile of the blaze was alerted of the threat and told to quickly evacuate. Source: [http://www.kulr8.com/news/local/8957112.html](http://www.kulr8.com/news/local/8957112.html)
Four people die in medical helicopter crash

Sunday, March 21, 2004 Posted: 6:42 PM EST (2342 GMT)

PYOTE, Texas (AP) -- A medical helicopter crashed early Sunday en route to a hospital and killed four people, including the 3-month-old patient and his mother, both of whom were Mexican.

A nurse was critically injured in the crash near Pyote, said CeCe Wilmes, head of emergency services at Medical Center Hospital in Odessa, where the helicopter was based. The crash site is about 40 miles (64 kilometers) southwest of Odessa.

The baby was having trouble breathing and was being taken from a hospital in Alpine in southwest Texas to University Medical Center in Lubbock, Wilmes said.
U.S.

Ambulance crew members shot dead in Kansas

Saturday, April 3, 2004 Posted: 12:03 PM EST (1703 GMT)

(CNN) -- An emergency medical technician and paramedic were shot dead early Saturday in Kansas, just outside of Kansas City, police said.

"We did have a double homicide in Edwardsville, male and female," said Angela Carrillo, a dispatcher for the Kansas City Police Department. She said the two were shot at 12:20 a.m. as they were sitting at their staging post at the fire station in Edwardsville, awaiting calls.

A suspect has been identified but is not in custody, police said.

The victims, a 30-year-old woman and a 33-year-old man, were employees of the Metropolitan Ambulance Services Trust and lived in Shawnee, Kansas.

Their identities have not been released.

Kansas City Police Capt. Michael Kobe said the crime was discovered after the workers did not respond to a call.
Who are we in EMS?
5 Year Future Plans for MedStar Interviewees
(N = 189)
We have to face the fact that medics in many cases, perhaps most cases, will be “passing through” the field enroute to other careers, or parallel careers.
Our planning, as recruiters and staffers, is to realize that this fact must not be treated as a weakness but rather as a strength.
“I think we should create a whole career track where after five years, the paramedic is guaranteed a slot in medical school, followed by a residency program in emergency medicine. It's career progression.”

Bruce Dubin, DO, JD
Associate Dean for Academic Affairs
University of North Texas Health Science Center
A Moment’s Reprise...
And NOW, Ladies and Gentlemen!!!
The #1 Issue in EMS Today!
The Now Issues

Clinical
- Patient Assessment
- Airway
- ET Intubation
- The "Smart Bag"
- The "rescue airway"
- Capnography
- Avoiding overventilation
- CPAP
- ResQ Pod
- Intraosseous
- 12 Lead ECG
- ECG Transmission?
- Hypertonic Saline

Administrative
- Finding Staff
- NEMSIS
- Credentialing Online
- ePCR
- Non-transport
- Statewide Protocol Set
- Standard Treatment List
- Holding the wall
- Diversion
- House call?
- Research
- Distributive learning
- Preparedness
YOU
Of ALL of these ISSUES:

It falls to you, the critical care provider, to carry the torch of mercy, compassion, and love.
EMS is the hardest, most thankless medical job there is.

Whether or not you know it, you who work the streets day to day are the real heroes...in the ditches, in the dark, at 3 a.m.
BP = 88/55
P = 160
Resp = 36
TV = 800
Glu = 425
Hgb = 9

The Medics of the Near Future will be “Out of Hospital Intensivists”
Will you find your path?
YOU
MUST
FIND
YOUR
WAY!
Questions or Comments??