

EMS Safety...NOW!

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Objectives

- Review the development of EMS vehicles in the US
- Identify and discuss safety issues inherent in the design of today's ambulance
- Identify specific safety risks and ways to avoid them during the various phases of an ambulance call
- Discuss coming changes in ambulance design that will enhance provider and patient safety
- Discuss current efforts to improve EMS safety, and how you can play an important role in creating an EMS Culture of Safety

Overview

Just how dangerous is EMS?

Injuries per 100 full-time workers

- National Average 7.0
- EMS Personnel **19.6**

Maguire, BJ,
"Occupational Injuries Among Emergency Medical Services Personnel",
Prehospital Emergency Care, 2005

Overview
Just how dangerous is EMS?

Transportation-related Fatalities per 100,000

- National Average 2.0
- Firefighters 5.7
- Police Officers 6.1
- EMS Personnel **9.6**

Kahn, CA "EMS, First Responders & Crash Injury",
Topics in Emergency Medicine, 2006

Overview
Just how dangerous is EMS?

Fatal Occupational Injuries per 100,000

- National Average 5.0
- Firefighters 16.5
- Police Officers 14.2
- EMS Personnel **12.7**

Kahn, CA "EMS, First Responders & Crash Injury",
Topics in Emergency Medicine, 2006

Overview
Just how dangerous is EMS?

- Non-fatal injury rate for EMS 5 times higher than for health care workers in general
- EMS practitioners 7 times more likely than avg. worker to lose work as result of injury

Overview

How can we make EMS safer?

- Understand how we got to where we are
- Recognize the dangers of being an EMS practitioner
- Reduce the danger by planning ahead & observing some basic safety principles
- Create a "Culture of Safety" within our own EMS organization

**Development
of the
Modern
Ambulance**

**What can we do
to make our workplace
safer?**

Vehicle Design

Emergency Response



Question:

- What percentage of ambulance crashes occur when running "hot" (emergency warning lights and siren)?

70%

Running Hot: Legal Implications

- Does your department have SOP's or protocols regarding use of emergency equipment? Did you follow them?
- Was use of emergency equipment **medically** necessary?



Question:

- Where do most ambulance crashes occur?

At Intersections

Avoiding Distractions

- Turn cell phone off, or on vibrate & out of reach
- Have partner operate radio, computer, GPS
- No music while responding
- Limit conversations to those necessary

Example: Passenger responsible for warning of traffic from right

Training

- How much time (initial and recert) have you spent learning to perform CPR?
- How often do you perform CPR?
- How much time (initial and recert) have you spent learning to drive an emergency vehicle?
- How often do you drive an emergency vehicle?

**Hazards in
the Cab**

Scene Safety

Incident Safety Zone

SPEED LIMIT	SAFETY ZONE
35	100'
45	150'
55	200'
65	250'

- Scenes with Potential for Violence***
- It's not necessarily an EMS emergency just because police are there
 - The scene is not necessarily safe just because police are there
 - Stage when possible
 - Always leave yourself an exit route
 - Make it clear to all that you're there to help
 - Treat people with respect

- A Word about School Shootings***
- Old approach:
 - Police will wait until necessary resources (SWAT, Command) are in place before entering
 - New approach:
 - As soon as 2-4 officers on scene, they will enter and move toward sound of gunfire
 - What it means to us:
 - Command may NOT be in place and scene may NOT be secure when we arrive

Weapons

We are not authorized to perform weapons searches

We ARE authorized to perform patient assessments, which may reveal the presence of weapons

Do not attempt to secure a weapon unless you know how



Chemical Suicide

Chemical Suicide

- AKA "Detergent Suicide"
- In US, usually inorganic acid + pesticide or garden product
- Products combined in bucket/tub
- Tape used to seal joints & seams in room or vehicle
- Suicide note or warning taped to door or window
- Main toxic product is Hydrogen Sulfide (H₂S)



Tips for Handling Chemical Suicides

- If you smell sulfur or rotten eggs, **BACK OFF!**
- Unresponsive in vehicle? Look for:
 - Note taped to window or door
 - Taped door or window seams
 - Residue or glass stains (often yellow)
 - Evidence of chemicals in vehicle
- Treat as a HazMat scene
 - Create Hazard Zones
- Do not enter vehicle without PPE





Patient Restraints

- **MUST** have a department policy/SOP
- Police should be on scene
- No less than 5 people necessary
- Once on, do not come off until under control @ hospital
- Document everything, including your attempts to gain control without physically restraining

Moving the Patient to the Ambulance



Staircases

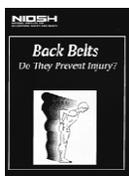
- Clear of junk
- Conscious = stair chair
- Unconscious = Reeves sleeve
- Backup guide

BACK INJURY PREVENTION

- Posture
- Body mechanics
- Education
- Conditioning



“After a review of the scientific literature, NIOSH has concluded that, because of limitations of the studies that have analyzed workplace use of back belts, the results cannot be used to either support or refute the effectiveness of back belts in injury reduction. Although back belts are being bought and sold under the premise that they reduce the risk of back injury, there is insufficient scientific evidence that they actually deliver what is promised. The Institute, therefore, does not recommend the use of back belts to prevent injuries among workers who have never been injured.”



Hazards in the Patient Compartment

Personnel Restraint Systems

- Positioning of controls & supplies distant from medic
 - Must remove restraint to access
- Head protection
 - Proximity of head to exposed cabinetry

Personnel Restraint Systems

Harness vs lap and shoulder belt



CPR during transport

- Calling the code on scene?
 - Can't always do that
- Manual CPR in a moving ambulance
 - Adequate 37% of the time*
- Mechanical CPR in a moving ambulance
 - Adequate 97% of the time*

Braunfels S. et al
"A Randomized Controlled Trial of the Efficacy of
Closed Chest Compressions in Ambulances"
Prehospital Emergency Care, 1997

***Hazards in the Patient
Compartment***

- The REAL world of EMS
 - Sometimes need to be un-restrained to provide patient care
 - The interior of our ambulances was not designed with safety in mind
 - We probably carry too much stuff
 - Our stuff can hurt us if it's not secured
 - There is no good restraint system for a side-facing seat

***Hazards in the Patient
Compartment***

- Injuries can happen WITHOUT collisions
 - Sudden stops
 - Evasive maneuvers
 - Curb strikes
 - Slips & falls

Trip Hazards

- Wet floors
 - Blood
 - IV fluids
 - Vomitus
- Gear
 - Trauma kits
 - Running gear, helmets

Hazards We Can Control



- Securing equipment
 - NOT on the cot with the patient
 - Portable oxygen bottles
 - Gear bags
 - Store anything not needed for patient care in outboard compartments
 - Fire gear, helmets
 - Extra O2 bottles

Reducing Your Risk

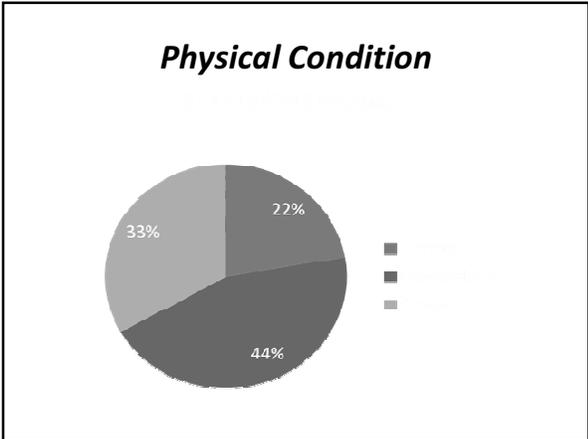
- Remain seated and restrained as much as possible
- Get as many patient care activities as possible done BEFORE the ambulance moves
- Transport patients upright whenever possible
- Keep the number of people in the patient compartment to a minimum
- Only bring into the ambulance the equipment you need
- Secure your equipment

The Human Factor

Top Ten "Least Well Rested"

1. Home Health Aides	6. Social Workers
2. Lawyers	7. Computer Programmers
3. Police Officers	8. Financial Analysts
4. Physicians, Paramedics	9. Plant Operators
5. Economists	10. Secretaries

National Health Interview Survey, 2012



At the Hospital

Transferring the Patient

- Direct Transfer
 - Cot at right angle to bed
- Sheet transfers
 - Receiving bed slightly lower than ambulance cot
- Have enough help
- Use a transfer device
 - Especially with bariatric patients

What's In the Future for EMS Safety?

**Organizations
Currently Working to
Improve EMS Safety**

How Can YOU Help?

- Things you can do NOW!***
- Secure your equipment & your patients
 - Stay belted as much as possible
 - Minimize use of RLS
 - Take care of your health & physical condition
 - Get enough rest
 - Stay informed
 - Be open to new ideas
 - Talk the Talk
 - Walk the Walk

CONCLUSION



- EMS is a dangerous profession
- The rear of an ambulance is a dangerous workplace
- Changes are on the way that will hopefully make our work environment safer
- There are steps we can take NOW to improve our chance of making it home alive and well at the end of our shift

References

- Kahn, CA "EMS, First Responders & Crash Injury", Topics in Emergency Medicine, 2006:28(1)68-74
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- Ferno (www.ferno.com)
- Stryker EMS (www.ems.stryker.com)
- Wheeled Coach (www.wheeledcoach.com)
- Horton Emergency Vehicles (www.hortonambulance.com)
- American Medical Response (www.amr.net)
- Swab Wagon Company (www.swabwagon.com)
- Whelen Engineering (www.whelen.com)
- Physio-Control Inc (www.physio-control.com)
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