

OKLAHOMA EMT ASSOCIATION
EMTA
PROVIDING SAFE EDUCATION SINCE 1982!

OEMTA, Medic Update
Enid, OK, July 26th, 2008

Enhanced Safety of the EMS Vehicle



Nadine Levick, MD MPH
Research Director, EMS Safety Foundation
CEO, Objective Safety
New York, USA

Firstly!

▶ An ~~accident~~ ?

▶ or
▶ a predictable and preventable event

<http://www.objectivesafety.net>



Real world answers to real world questions -

- ▶ What features will enhance safety of my new vehicle purchase?
- ▶ What color scheme do I want on my vehicle to make it safest?
- ▶ Do I need a helmet, and if so which one?
- ▶ What policies offer the safest system?
- ▶ How do I get my team to address safety issues?
- ▶ What data should I collect when something goes wrong, and how to analyze it?

EMS Transport Safety

- ▶ 'patient safety'
- AND also
- ▶ 'provider' and 'public safety'

A tragic emergency health care intervention outcome



Rollover Crash Kills Medical Technician
Ambulance Rollover Kills Both Crew, Sparing One Passenger's Patient

It does happen....

A devastating tragedy...

- ▶ An ETT down the wrong hole may kill your patient and be a terrible burden for the pts family and for the medic involved
- ▶ BUT an EMS crash can kill all involved AND wipe out an EMS systems response capacity.....

Very Important Principle

Ambulance transport safety is part of a SYSTEM, the overall balance of risk involves the safety of all occupants and the public

Thursday July 5th 2007..... Paramedic Allan Parson's killed

NEWS CENTER

Paramedic Killed in Turner Ambulance Crash


The City of Turner, Oregon, is mourning the death of a paramedic who was killed in a crash involving an ambulance on Thursday, July 5, 2007.

The ambulance was en route to a patient's home when the crash occurred. The paramedic was the only person killed in the crash. The ambulance was carrying a patient who was not injured.

The paramedic who died has been identified as Allan Parson, 40 years old, of Turner, Oregon.

A coroner's report is expected to be released in the next few days.

Turner Police Department is currently investigating the crash. The crash occurred on the north side of Turner, Oregon, on Thursday, July 5, 2007, at approximately 10:30 a.m.



"...I'd like to know what can be done so this never happens again..."

Posted by [User](#) on July 3, 2007 4:33 PM (Suggest Removal)
 to all the people worried about how fast the amt was going, would it be fast enough if it was your loved one in there.....

| Add your comments

Posted by [User](#) on July 5, 2007 1:19 PM (Suggest Removal)
 to mad: it would be too fast if they ran over my family member on their way to another's family member....

| Add your comments

Posted by [User](#) on July 5, 2007 1:58 PM (Suggest Removal)
 In X response: Why can't I cannot guess this? A man is dead and I want to know if the actions and situation surrounding this were worth this cost. And I'd like to know what can be done so that this never happens again.

2 weeks later... Friday July 20th 2007
The worst ambulance crash in USA history

Five Killed in Crash of Ambulance and Semi
 July 21, 2007 08:20 AM EDT

IAN WERT, OHIO (AP) — The Ohio State Highway Patrol continues to investigate the crash of an ambulance that killed four people Friday night, including three emergency medical technicians. Troopers say the ambulance was broadsided by a semitrailer in Crane Township, about 55 miles southwest of Toledo.

The ambulance, with four Antwerp Emergency Medical Services workers aboard, was taking two victims from an earlier car crash to a hospital. Troopers say it was broadsided by a tractor-trailer at the intersection of County Road 176 and County Road 87. The ambulance then burst into flames.

The Highway Patrol says three EMS workers were killed. They were identified as 44-year-old Sammy Smith, 30-year-old head EMT/paramedic and 25-year-old Kelly Rager. The two paramedics also killed. They were identified as 44-year-old Robert Wally, 60-year-old Arnette Wally of Newcastle.

Another emergency medical technician, Matt McLaughlin, and the truck driver, Gerald Chapman, 37, of Indiana, were both taken to the hospital. It's not yet clear whether they suffered any injuries.

Authorities have not said who had the right of way at the road intersection nor have they said if the ambulance's emergency siren and lights were turned on.

Antwerp fire chief says, 'They were doing what they loved...'

Lisa Hickey
 July 21, 2007

TOLEDO, Ohio
 The 1998 ambulance crash that killed four people Friday night, including three emergency medical technicians, has shocked the region.

Emergency personnel throughout the region are also shocked and mourning their own.

"That's one of our worst scenarios when it's one of our own," said Con Shubert of the Payne Fire Department.

"Everyone is a brotherhood," said Friend. "Everybody looks after everybody."

Randy Shaffer, director of Paulding County Emergency Management Agency, said the accident has had a deep impact.

"It has affected every emergency personnel in the county," he said. **"We know a could happen at any time. We read about it in our newspaper. We just don't think it's going to happen to us."**

Shaffer said when a call came in that an ambulance was involved in an accident Friday, "I think every squad in the county activated."

April 14th, 2008

Ambulance worker loses arm in accident - West Nyack, New York


An emergency service worker lost her right arm today after the ambulance in which she was a passenger crashed into a truck parked along Route 59 near the Payson to the Palisades Center mall.

Bonnie Ames, 26, was taken by helicopter to the Westchester Medical Center in Valhalla where she underwent surgery.

"She's out of danger, but she lost her arm," Raymond Florida, director of Rockland Paramedic Services said early this evening.

"We used multiple units from the jaws of life to extricate her," West Nyack Fire Chief George Drexler said. "She appeared to be seriously injured."

The paramedic van driver, 19-year-old Scott, was taken to Westchester Medical Center, said



June 17th 2008
a paramedic and a patient killed



EMS CRASH KILLS PATIENT AND A SUSSEX COUNTY (DE) PARAMEDIC IN THE LINE OF DUTY
 Tuesday, June 17, 2008

We report to advise you that a female Sussex County (DE) Paramedic was killed in the Line of Duty as was a patient killed in a horrific crash involving an ambulance in Sussex County (DE) this morning.

The single vehicle crash happened around 0240 Hours on the John J. Williams Highway near the Levers-Ruboboth joint fire company station in Aquia.

The M4-Sussex Rescue Squad ambulance was transporting to Berbe Medical Center with a patient, 2 MSRS Squad members and the Sussex County Paramedic were on board when it struck a tree, which opened the side of the ambulance as seen on our home page. Tragically, the patient was killed as was the Sussex County EMS Paramedic, who was killed in the Line of Duty.

Sussex County EMS also suffered a close call last year when a Paramedic John Schmitt was seriously injured in a crash when a civilian struck the Millard Fire Company ambulance he was riding in, while returning from a run. Additional details on this morning's crash will follow.

In this vehicle...



Charged with Vehicular Homicide

Penn Top, ambulance driver faces charges in crash - Pennsylvania
 A Penn Township Rescue 6 ambulance driver faces a charge of homicide by vehicle in an Oct. 30 accident in Hempfield that killed a Westmoreland County Prison guard.

A Penn Township Rescue 6 ambulance driver faces a charge of homicide by vehicle in an Oct. 30 accident in Hempfield that killed a Westmoreland County Prison guard.

Jason Fat, 30, of 8850 James Lake Road, North Huntingdon, was arraigned this week and will have a preliminary hearing at 1:45 p.m. Sept. 27 before Judge District Judge Joseph DeLacorte. Bond was set at \$25,000 unsecured. Fat also was charged with reckless driving, careless driving and other traffic offenses.

State police at Greensburg said Fat was driving an ambulance west on Route 130 at 5:49 a.m. Oct. 30 when he ran a red light at North Greengate Road and hit a Ford Bronco driven by Frank Scalise Jr., 46, of Marysville, that was traveling south.

Scalise, who began working at the prison in 1992, was reportedly on his way there at the time. According to the criminal complaint, Scalise was taken by medical helicopter to UPMC Pittsburgh, he died Nov. 3 of blunt-force trauma of the head, according to the Allegheny County Medical Examiner's Office.

Fat was not injured, but the ambulance was heavily damaged. Police indicated the ambulance was returning to its station after transporting a patient and did not have lights or siren activated, asked about Fat's employment status Friday, a representative of the ambulance association had no comment.

2 counts of vehicular homicide...
November 5, 2007 - PA

Drunken ambulance driver killed 2 in car crash - Pennsylvania

A 22-year-old ambulance driver drank before her shift and was impaired when she collided with a car in Marshall, killing two men instantly, Allegheny County District Attorney Stephen A. Zappala Jr. said today.

Shanea Leigh Climo, 22, of Evans City, is charged with two counts of homicide by vehicle and involuntary manslaughter, driving under the influence and several traffic offenses in the Sept. 23 collision at Perry Highway and Brush Creek Road. She was arrested this morning, arraigned and released on her own recognizance, authorities said.

Police said an on-board camera system in the ambulance helped them decide to file charges. The camera allegedly shows the face of the driver, Shanea Climo.

Zappala said Climo was traveling south on Route 19, transporting a patient with a do-not-resuscitate order to UPMC Passavant, when she ran a red light and hit a Chevrolet Cavalier driven by Douglas Scott Smith and a passenger, Philip Bacon, were killed.

The patient later died, but his death was not believed to be related to the crash, Zappala said.

An interhospital transport ? "Do no harm...."?

Pa. ambulance involved in crash; patient pronounced dead at scene

By Lisa M. Wenzel
 The Carlisle Interhospital Regional Lab's first Newspress.com All-Region News

An Adams County ambulance carrying a patient to York Hospital collided with a car at the intersection of Routes 30 and 412 on Saturday morning, and the patient was pronounced dead at the scene.

York County Health Care Center Chief of Staff Dr. David M. Wenzel, MD, said the patient was pronounced dead at the scene.

He said he's still trying to determine whether the crash is a medical error or a driver error. He said he would like to see the ambulance driver's license and driving record. He said he would like to see the ambulance driver's license and driving record.

Benefit of Safety

- ▶ Any cost of addressing these issues is dwarfed in contrast to the huge burden of not doing so - in financial costs let alone the personal, societal, ethical and litigation costs

Unique workplace

- ▶ In vehicles
- ▶ At roadside and other emergency scenes

Absence of standards and oversight

- ▶ Challenges in identifying best practice
- ▶ Myriad of unregulated commercial products
- ▶ No safety performance standards
- ▶ Absent national safety oversight

- ▶ What we need to consider, where is the 'bang for buck' in ambulance transport safety:

Challenges to Optimizing EMS Transport Safety

- ▶ Disparate and fragmented safety infrastructure
- ▶ Lack of a centralized EMS Safety oversight or data
- ▶ A large number of small groups of end users, with a mix of volunteers and professionals
- ▶ Ambulances are hybrid non-standard vehicles, a truck chassis and an after market box or a modified van
- ▶ EMS vehicle safety is not integrated as a part of the transport safety industry

1960 to 2007



Some recent adverse outcomes



UPS and Laundry trucks have very similar design and even more stringent safety requirements to EMS vehicles BUT very different cargo.....

People are passengers and NOT packages or parcels

Some odd facts

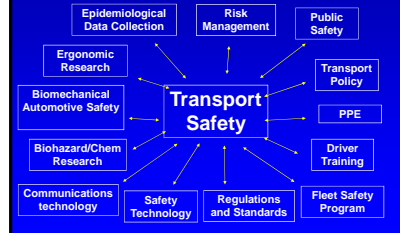
- ▶ Ambulances are generally not built by the automotive industry
- ▶ Intelligent Transportation Systems (ITS), transportation safety engineering is not generally integrated into EMS systems
- ▶ Although all EMS systems have medical direction and oversight, it is rare for there to be transportation expertise oversight

EMS Transport General Concerns

- ▶ Consequences can be predictable & likely preventable
- ▶ Costs of these adverse events are high in loss of life, financial burden and negative impact on delivery of EMS care
- ▶ Other high speed vehicles (eg. racing cars) have a different safety paradigm
- ▶ Design of interventions to mitigate injury is predicated on a valid testing model
- ▶ Complex both engineering and public health issues



Ground Transport Safety IS Complex AND Multidisciplinary



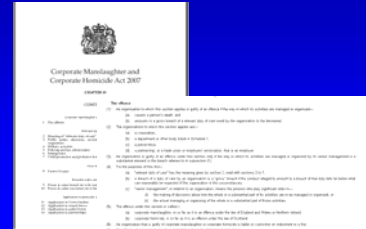
Safety oversight of what and by whom

- ▶ Vehicle Safety
- ▶ Vehicle Design
- ▶ Transportation systems safety
- ▶ Safety Equipment Design
- ▶ Vehicle and Safety Equipment Testing and Standard development
- ▶ Safety policies

There are more safety standards for moving cattle than for moving patients



Canada - Corporate Manslaughter and Corporate Homicide Act: 8th April, 2008



the EMS transport process

- ▶ communications/dispatch
- ▶ the patient
- ▶ restraining device/seat
- ▶ transporting device/gurney
- ▶ paramedics/transport nurses, doctors & family
- ▶ patient monitoring equipment
- ▶ clinical care & interventions
- ▶ protective equipment
- ▶ the vehicle
- ▶ the driver/driving skill
- ▶ other road users
- ▶ the road



The Emergency Department (ED)



An ambulance is not an ED /ICU on wheels





Is there an acceptable rate of morbidity and mortality for pre-hospital transport systems??

National EMS data

In the USA*

- ▶ ~ 50,000 vehicles
- ▶ ~ 5,000 crashes a year
- ▶ ~ One fatality each week
 - + ~ 2/3 pedestrians or occupants of other car
 - + Approximately 4 child fatalities per year
- ▶ ~10 serious injuries each day
- ▶ Cost estimates > \$500 million annually
- ▶ USA crash fatality rate/capita 35x higher than in Australia

*FARE 8/73/2006

Is it your service's tragic year?

- ▶ ~ 50 fatalities a year
- ▶ 15,000 EMS services
- ▶ Each year one in 300 services experiences a fatality



and what is killing EMS ?

EMS personnel fatalities*

- ▶ 74% transportation related
 - + 1/5 of ground transport fatalities were struck by moving vehicles
- ▶ 11% were cardiovascular
- ▶ 9% were homicide
- ▶ 4% needle sticks, electrocution, drowning and other

* Maquire, Hunting, Smith & Levick, Occupational Fatalities in Emergency Medical Services: A Hidden Crisis, Annals of Emergency Medicine, Dec 2002

▶ "Ambulance transport has a death toll...."

Carl Craigle EMT-P, Chief Platte Valley Ambulance Colorado Springs, April 2007





**Clinical Care?
Occupational Health and
Safety.....?**

- ▶ **This IS a Transportation and Automotive Safety issue**
- ▶ **This is a Systems safety issue**

**What do ambulance crashes
really cost ?**

- ▶ Loss of life and injury
- ▶ Negative impact on EMS system
- ▶ Collisions are the largest liability cost and exceeds malpractice or negligence
- ▶ Besides the direct financial costs of replacing a damaged ambulance and equipment, there are additional hidden costs incurred:
 - investigating the ambulance collision
 - litigation/settlement/lawsuit
 - medical/disability costs of injured EMTs
 - hiring of new employees to replace injured personnel
 - retraining and psychological counseling of personnel involved and others
 - increased insurance rates

June 2007

A problem

2007 Insurance data –

- ▶ **27** fold more likely to have a claim based on transport than related to medical care

Benefit of Safety

- ▶ **Safe practices save lives, time and money**

This is about you and your safety

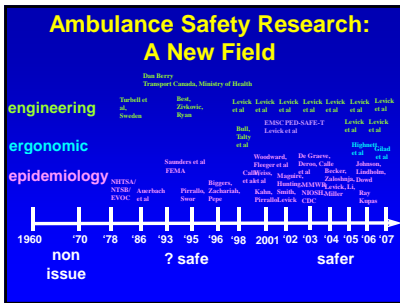
- ▶ **What safety practices do you use??**
 - Seat belts ?
 - EVOC training ?
 - Equipment lock down ?
 - Helmets ?
 - Driver Feedback technology ?
 - Tiered dispatch ?

Balance of concerns and risk during transport

- ▶ Response and transport time
- ▶ Clinical care provision
- ▶ Occupant safety/protection
- ▶ Public Safety

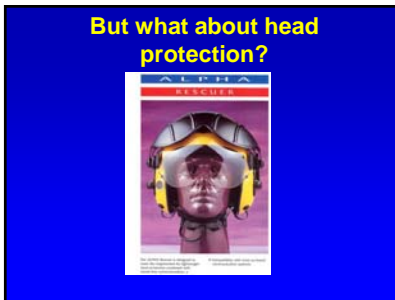
Goals

- ▶ Standards for safety
- ▶ Policy based on Science
- ▶ Databases to demonstrate outcome



Increasing awareness ...

EMS Best Practice, Sept 2006

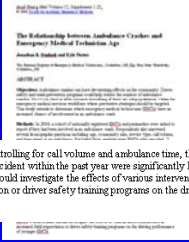


- ### Problems
- ▶ No Standards
 - ▶ Unique safety and hazard protection needs
 - ▶ A number of less than appropriate devices out there

- ### What are the solutions?
- ▶ Training?
 - ▶ Practice Policy?
 - ▶ Transportation Systems Engineering?
 - ▶ Automotive Engineering?
 - ▶ Education of other road users???

- ### The Driver
- ▶ Driver selection
 - ▶ Driver monitoring and feedback
 - ▶ Driver Impairment
 - ▶ Driver training

Driver issues



Conclusions: When controlling for call volume and ambulance time, the odds of having been in an ambulance accident within the past year were significantly higher for younger EMTs. Future studies should investigate the effects of various interventions such as increased field supervision or driver safety training programs on the driving performance of younger EMTs.

Which is best, how many hours...??



What about changing driver behavior in the real world??

AN OPTIMAL SOLUTION FOR ENHANCING AMBULANCE SAFETY: IMPLEMENTING A DRIVER PERFORMANCE FEEDBACK AND MONITORING DEVICE IN GROUND EMERGENCY MEDICAL SERVICE VEHICLES

Nadine R. Levick, MD, MPH
Maimonides Medical Center

REAL WORLD APPLICATION OF AN AFTERMARKET DRIVER HUMAN FACTORS REAL TIME AUDITORY MONITORING AND FEEDBACK DEVICE: AN EMERGENCY SERVICE PERSPECTIVE

Nadine Levick
Objective Safety LLC
United States of America
Larry W. Korsch
Michael J. Nagel
Cognitive Architecture
United States of America
Paper Number 07-2224

Purpose of 'Feedback box' Program

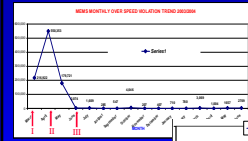
- ▶ Enhance Safety
- ▶ Improve Driver Performance
- ▶ Save Maintenance Dollars
- ▶ Aid Accident / Incident Investigation

How the Device Works

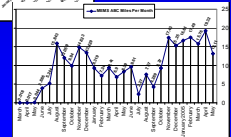
- ▶ Computerized monitoring device installed on each vehicle to measure parameters
- ▶ Each driver has individual key "fob"
- ▶ Data collected every second
 - including: vehicle speed and performance, driver behaviors and emergency mode
- ▶ Auditory feedback of warning 'growls', and penalty tones
- ▶ Data downloaded automatically every day



Demonstrated Effectiveness



- I - blind data, no growls
- II - growls & tones ON unidentified data capture
- III - identified data



A key to safe ambulance transport



Monitoring and feedback devices

- ▶ Implementation well received by the providers.
- ▶ 20% cost saving in vehicle maintenance within 6 months.
- ▶ No increase in response times
- ▶ Fewer crashes and less severe crashes
- ▶ Sustained improvement in safety proxies, with no inservice or retraining after the initial introduction period.

Other monitoring devices

- ▶ Primarily to record events during and immediately preceding a crash
- ▶ Give no driver crash prevention feedback
- ▶ Administratively burdensome
- ▶ Intrusive
- ▶ Not demonstrated to be as effective in improving vehicle maintenance costs or as effective in modifying driver behavior long term

You want a system that works!!

- ▶ Does the system really work
- ▶ Is it going to be a major burden on your staff to implement
- ▶ What are the real costs
- ▶ Are you going to have video of your company vehicle on you tube??

The jury is out on

- ▶ Opticon
- ▶ Simulators

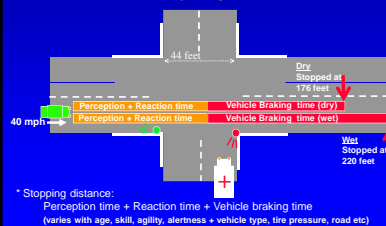
And very Predictable...

- ▶ Intersections are lethal environments

So.. The real world for an EMS vehicle approaching a red light

- ▶ You think they heard you...
- ▶ You know they must have seen you..
- ▶ And maybe they did
- ▶ But..
- ▶ There is NO way humanly possible that they could stop.....

The real world Intersection passenger car stopping distance* at 40 mph dry and wet



Dynamic vs. Static Safety Testing

Dynamic Safety Testing

- ▶ requires sophisticated, expensive equipment
- ▶ measurably demonstrates forces generated during collision
- ▶ accepted international standard for vehicle restraint systems

The Crash Event - Crash Testing

- ▶ An introduction
- ▶ What one needs to know
- ▶ What do the tests really mean
- ▶ And, what tests are meaningful

Intrusion vs Deceleration

- ▶ **Intrusion**
= vehicle to vehicle or vehicle to fixed narrow object
- ▶ **Deceleration**
= sudden stop – ie. sled test

If we know this – and its published...



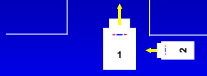
Levick NR, et al. Development and Application of a Dynamic Testing Procedure for Ambulance Pediatric Restraint Systems, SAE Australasia 1998;862:45-51

Why do we do this?



Full Vehicle Crash Testing

Test 1 – Right side impact



- 1 - Target vehicle, Type II ambulance
 - 2 - Bullet vehicle, Type II ambulance
- Crash speed 44 mph



And this all takes place in 60 milliseconds – the blink of an eye



NIOSH Ambulance Occupant Safety Crash Testing



Impact Direction
25 MPH!

'Safety' approaches being driven by manufacturers claims and sales rather than by science and data



NOT new technical data...

Richardson S.A., et al. Int. J. of Crash, 4:3, 239 - 259, 1999

Side facing 4-point harnesses demonstrated to be lethal, even at slow ground vehicle speeds

The Ride of Your Life....

NIOSH Ambulance Occupant Safety Crash Testing

Impact Direction 25 MPH!

Being seated IN an automotive seat is what will protect you

- ▶ Anything that allows or encourages you to get up out of your seat will also encourage you to be injured or killed – it is potentially lethal to be out of your seat in any fashion
- ▶ 4 or 5 point harnesses for sidelacing occupants are potentially lethal – and is in **NO WAY SUPPORTED BY ANY DATA OR AUTOMOTIVE SAFETY EXPERTISE**

**Rash of "Safety Concept" vehicles.....
Devoid of substantive automotive safety engineering input or testing**

concept vehicles I & II ??

Bigger is not necessarily better.....

**NO automotive safety engineer
NO crashworthiness engineer
NO ergonomist**

NO reference to ANY existing or relevant automotive safety or crashworthiness technical publications....

yet multiple occupant fatalities and injuries annually....

Yet another potentially lethal example marketed as a 'safety innovation' YET outside of automotive safety practice



Yes, the ride of your life....

- ▶ Sure... these vehicles all parade around the EMS and Fire shows BUT...
- ▶ NOT ONE of these vehicles has been to the automotive safety shows or scrutinized by the automotive safety industry

Safety concepts out there now

- ▶ Driver feedback technologies
- ▶ Tiered dispatch
- ▶ Enhanced ambulance vehicle design
- ▶ Intelligent Transport Technologies - ITS
- ▶ New Safety Standards

The EMS Safety Foundation
Intro and Logistics Webinars from
December 11th 2007 & Jan 8th 2008
EMS Safety Foundation tab at
www.objectivesafety.net



National Academies Transportation Research Board's (TRB)
And Your New EMS Transport Safety Subcommittee



TRB EMS Safety Update

- ▶ Brought together NHTSA, FHWA, TRB, National Academies, DOT, CAMTS & EMS
- ▶ 3 presentations
 - TRB and EMS
 - Safety air/ground
 - Ground Ambulance Safety Issues and Directions
- ▶ Recorded presentations and handouts available at www.objectivesafety.net
- ▶ Potential for EMS safety research funding
- ▶ Next TRB meeting January 11-15, 2009 – all are welcome

Ambulance Transportation Safety Task Force
January 25th 2008



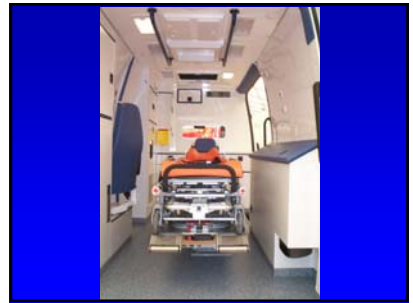
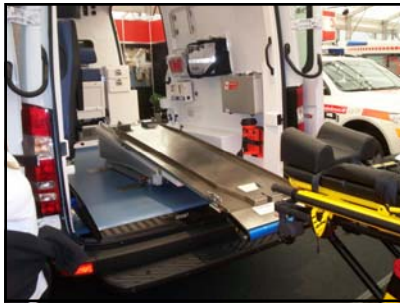
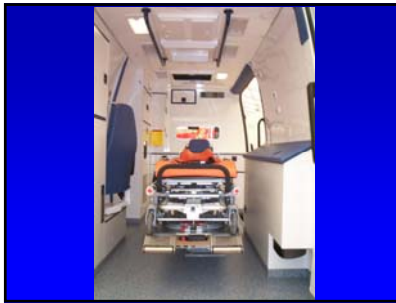
TRB
Jan.
16th
2008

International approaches

- ▶ The state of the art non-USA vehicles have NO squad bench nor the after market structural vehicle modifications that can potentially decrease crashworthiness integrity that were seen in study vehicles.

RETTmobil – 'Mobile Rescue'
Major European event for EMS innovation
Fulda, Germany May 2008
<http://www.rettmobil.com/>







Vehicle Occupant Safety design

2008 European design
Safety technology is a key focus



Ergonomic design



27 inch loading height - Sprinter



European HiViz Markings



Australia, Melbourne



NSW Australian vehicles



Flexibility to manage two patients

High speed crash, rolled and the occupants (patient and medics) had only minor scratches

Norway initiatives

So....

- ▶ Which vehicle do you want to be in ?
- ▶ Which vehicle is the best for efficient, and effective patient care?
- ▶ Which vehicle provides optimal risk management ?
- ▶ What is the optimal fleet mix?

Were we safer in the Cadillac???

Other successful models

Ergonomic layout and equipment

Safety concepts out there now

- ▶ Fleet Safety Management
 - Z-15
 - Driver monitoring and feedback
- ▶ Enhanced ambulance vehicle design
- ▶ Intelligent Transport Technologies - ITS
- ▶ Visibility and Conspicuity
- ▶ New Safety Standards
- ▶ Life Safety Initiatives
- ▶ Resources and information

American National Standard ANSI/ASSE Z15.1-2006 Safe Practices for Fleet Motor Vehicle Operations

What Z15 encompasses

- ▶ Safety Program
- ▶ Safety Policy
- ▶ Responsibilities and Accountabilities
- ▶ Driver Recruitment, Selection and Assessment
- ▶ Organizational Safety Rules
- ▶ Orientation and Training
- ▶ Reporting Rates and Major Incidents to Executives
- ▶ Oversight

Use proven safety tools



NAEMT July 2006 Position statement

NAEMT

National Association of Emergency Medical Technicians
Statement on Safety Restraint Use in Emergency Medical Services

Statement

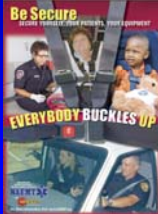
The National Association of Emergency Medical Technicians (NAEMT) strongly advocates the use of patients with restraint systems to prevent injury to EMS, Paramedics, patients, and all occupants of the emergency response vehicle.

Background

The NAEMT strongly advocates the creation of a National EMS Injury Data Base which can be used to quantify all injuries to EMS personnel involving all EMS levels involved.

The NAEMT strongly advocates the development of high-end scientific studies to determine appropriate restraint and protection systems for the EMS provider, patient and passengers of all emergency response vehicles.

Patients must be in the over the shoulder harness, medics restrained in seat belts, equipment secured



Hmm...



So why is it...

- ▶ That the EMS providers -
 - Were wearing navy blue – one of the most difficult colors to see at night
 - Had no head protection, when all other emergency personnel at the scene did
 - Had no protective clothing, when other emergency personnel at the scene did???

Worker visibility Act: Help is on the way !! November 24th 2008

PART 1001—WORKER VISIBILITY 1001.1 R446

1001.1 Purpose.

1001.2 Definitions.

1001.3 Rule.

1001.4 Compliance date.

Act No. 271 of 2008, ILLCS 1000.1, ILLCS 1000.2, and ILLCS 1000.3, amended by Act No. 1001 of 2008, ILLCS 1000.1, ILLCS 1000.2, and ILLCS 1000.3.

All workers within the right-of-way of a Federal-aid highway who are engaged in public utility or other work shall wear high-visibility safety apparel.

Workers must comply with the following distance placement within the right-of-way of a Federal-aid highway, such as highway construction and maintenance, tolling, survey crews, utility crews, maintenance activities, and other work.

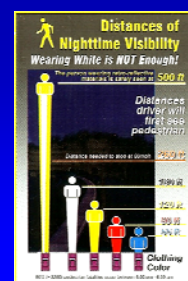
Science not, next best guess

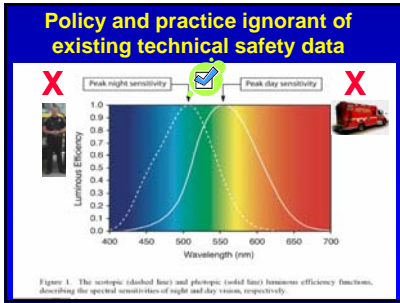
UMTRI UNIVERSITY OF MICHIGAN
 TRANSPORTATION RESEARCH INSTITUTE

Research on Mobilizing Emergency Vehicle Warning Lighting Systems

Human Factors - Industry Affiliation Program (HAFIP)

Industry Affiliation Program for Human Factors in Transportation Safety





Under Way... Emergency Vehicle Visibility and Conspicuity Study

- ▶ Funded by the USFA conducted by IFSTA
- ▶ Looking at the effectiveness of reflective markings used on emergency vehicles
- ▶ Doing best practice research and working with manufacturers



- ▶ Having access to that technical knowledge supports changes to improve safety practice

- ▶ Operating in an environment where many aspects of safety are still devoid of safety standards – requires technical knowledge and understanding

R & D "Ripoff and Duplicate"

- ▶ Avoid reinventing the wheel at all costs
- ▶ Where are the best practices that we need to transfer knowledge from

Air EMS is a role model for safety initiatives and focus



Integration and Collaboration

EMS Transport Safety Strategies - 2006-2007 New York State Strategic Highway Safety Plan



State Strategic Highway Safety Plans

- ▶ Required as part of the SAFETEA-LU legislation
 - (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users)
- ▶ Effective October 1st 2007
- ▶ Focus is the 4 'E's'
 - Engineering
 - Education
 - Enforcement
 - Emergency Medical Services
- ▶ EMS is a core theme

Oklahoma Strategic Highway Safety Plan



Oklahoma, where is your SHSP EMS Chapter!!

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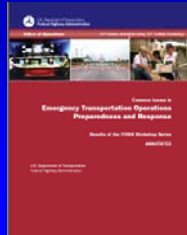
No need to reinvent the wheel...



UPS: The 'Big Brown'

- ▶ No left turns – instead make three rights
- ▶ Don't back up
- ▶ Don't employ any drivers under 25 years of age
- ▶ Don't employ anyone with a history of driving convictions

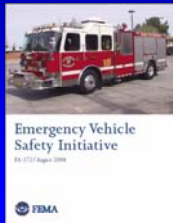
March 2007 - FHWA



Tips for Emergency Vehicle Operations

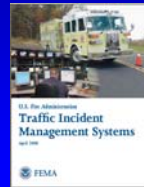


USFA Emergency Vehicle Safety Initiative



Traffic Incident Management Systems (TIMS)

- ▶ Just released April 2008
- ▶ FEMA, USFA, IFSTA
- ▶ Covers setting up safe roadway incident work areas and using unified command at these incidents



What do we know now??

- ▶ Intersection crashes are the most lethal
- ▶ There are documented hazards, some which can be avoided
- ▶ Occupant and equipment restraint with standard belts is effective. (Over the shoulder harnesses for patients should be used, with the gurney in the upright position where medically feasible)
- ▶ Some vehicle design features are beneficial - automotive grade padding in head strike areas, seats that can slide toward the patient
- ▶ Electronic Driver monitoring/feedback systems appear to be highly effective
- ▶ Head protection??

Safety Management

- ▶ A Safety Culture
- ▶ Protective Policies
- ▶ Protective Devices
 - To prevent a crash
 - In the event of a crash
- ▶ Continuous Education and Evaluation

Risk/Hazards

- ▶ Predictable risks
- ▶ Predictable fatal injuries
- ▶ Serious occupational hazard
- ▶ Public safety hazards

Creating a Safety Culture

within a company must start with upper management's commitment to safety

- ▶ Awareness
- ▶ Training
- ▶ Incentive

What do we know works...

- ▶ Vehicle Operations Safety Policies
- ▶ Squad bench lap seat belts
- ▶ Patient over the shoulder harnesses
- ▶ Securing equipment
- ▶ Forward and rear facing seating
- ▶ Some electronic technical devices
- ▶ Safety awareness
- ▶ Cultural change

What you can do now

- ▶ Have a written and implemented 'safety program'
- ▶ Secure all equipment
- ▶ Secure occupants with standard belts
- ▶ Don't drive through red lights/stop signs
- ▶ Use properly implemented "Feedback Boxes"
- ▶ Monitor crash events with common denominators (ie. per 100,000 miles and per trip)

Important Principles !

1. A culture of safety
 2. Drive cautiously
 3. Wear your belts & restrain all occupants
 4. Secure all equipment
 5. Integrate scientific data into your policies and procedures
- Unrestrained occupants and equipment are a potential injury risk to all occupants

Very Important Principle

Ambulance transport safety is part of a **SYSTEM**, the overall balance of risk involves the safety of all occupants and the public

small changes can make a BIG DIFFERENCE

- ▶ **PREPARE – TEACH – REACH – RESPOND**
 - ♦ **Look** at your own safety record
 - ♦ **Teach** safety and hazard awareness
 - ♦ **Reach** out with safety information to all your EMS providers
 - ♦ **Respond** with the best safety practices

**PREDICTABLE
PREVENTABLE
and
NO ACCIDENT**

Conclusion

- ▶ EMS transport has serious hazards and safety issues
- ▶ Major advances in EMS safety research, infrastructure and practice over the past 5 years
- ▶ New technologies for vehicle design, occupant PPE and equipment restraint and driver performance are now available
- ▶ Development of substantive EMS safety standards is a necessity and a reality
- ▶ Failure to transfer knowledge from transportation and automotive safety is unacceptable and dangerous
- ▶ EMS is still way behind the state of the art in vehicle safety and occupant protection

And....

- ▶ It is no longer acceptable for EMS to be functioning outside of automotive safety and PPE safety standards for prevention of and protection of EMS providers and the public from injury and death

Thank you! Any Questions??

an electronic recording and a .pdf handout of this presentation awaits you online

www.objectivesafety.net

