MMTS Seminar, NYC, July 17th , 2007
AAA Meeting, Hilton, New York

AMBULANCE SAFETY
So what's new…?

Nadine Levick, MD MPH
CEO, Research Director
EMS Safety Foundation
Objective Safety LLC

What's new

- New expertise and collaborations
- New automotive and safety technologies
- New Information
- New events

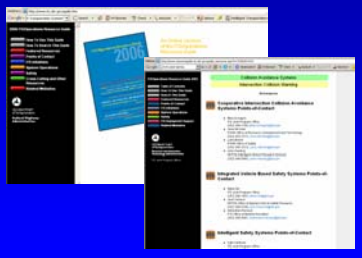
New expertise and collaborations

- TRB
- ASSE
- OSHA
- SAE
- UTRC
- Ergonomics
- Industrial Design

Regional University Transportation Research Centers

New automotive and safety technologies

- crashworthiness
- EVS
- ITS
- Monitoring and feedback enhancements



New Information

- ESV
- ASSE
- OSHA best practices
- KKK-F Public Comments
- Worker visibility Act
- SAFET-LU
- State Strategic Highway Safety Plans
- State EMS Council Policies

New Events

- OSHA best practices panel 06-07
- ASSE PDC, June 06 & 07
- TRB EMS Transport Safety, 07 & 08
- EMS Today 'panel', 07
- KKK-F Auto safety Public Comments
- State EMS Council, Safety subcommittees
- Safety Summit? 08

EMS Today.. 'expert panel'

SPECIAL REPORT

AMBULANCE SAFETY FIRST

Experts convene to discuss personal & patient safety issues

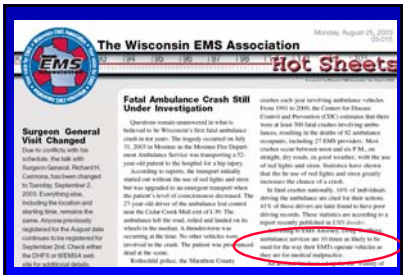
suggested looking to other related industries for the answer to safety issues. "We are grappling with issues that the automotive industry has already studied, has data [on], and knows only too well," said audience member Nadine Levick, MD, MPH, executive director of Objective Safety LLC.

Levick noted that ambulances are designed outside of the automotive industry and not tested for crashworthiness, "making them more than twice as lethal as large trucks." She was especially concerned about the seating arrangements inside the ambulance. "There's no justification for a sideways-facing seat in a forward-moving vehicle," she said.

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

Is it your services tragic year?

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

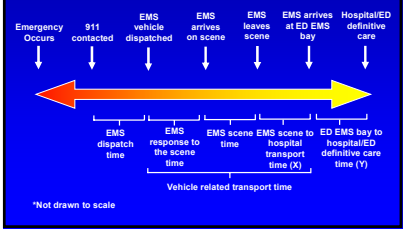
Key Elements to Safety

- Data Capture
- Vehicle Biomechanics and Crashworthiness
- Ergonomics and Biohazards
- Transportation Environment
- Safety Management – evaluation and analysis

What are the solutions?

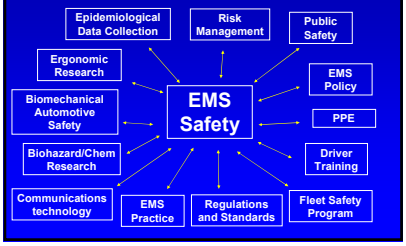
- Training?
- Practice Policy?
- Transportation Systems Engineering?
- Automotive Engineering?
- Education of other road users???

911 Call to Hospital/ED Definitive Care Time Intervals*



*Not drawn to scale

EMS Transport Safety IS Complex AND Multidisciplinary

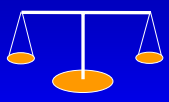


What's missing

1. What data is collected nationally?
   - We have no denominator data
   - We have incomplete numerator data
2. Absent population based national injury data or injury mechanics data
3. Absent structured transportation safety engineering input

   1+ 2 +3 = resultant inability to design and evaluate efficacy of injury interventions
4. What oversight is there?
5. Which organizations would determine policy?

Balance of concerns and risk during transport



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

An excellent model

http://www.EveryoneGoesHome.com

Transport related aspects of EMS

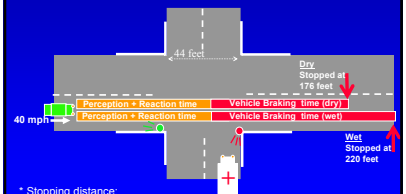
- dispatch of EMS vehicles
- transport policies and protocols
- vehicle fleets and vehicle design
- vehicle purchase standards
- Intelligent Transportation Systems technology
- driver training
- training simulation
- driver performance monitoring
- roadside and road design
- integrated traffic safety technologies
- scene safety and visibility
- safety data capture
- safety oversight

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

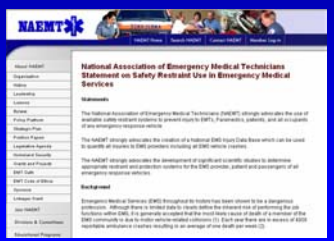


* Stopping distance:
Perception time + Reaction time + Vehicle braking time
(varies with age, skill, agility, alertness + vehicle type, tire pressure, road etc)

A peer reviewed tragedy

- Persistent disconnect between automotive safety science and EMS transport safety approach
- Pre-hospital and Emergency Care 2004
  - *"EMS vehicle drivers are advised to approach the intersection, slowing to ensure that traffic has stopped and making eye contact with other drivers before entering the intersection."*
- In the modern era of road safety to suggest that a strategy of "eye contact" to be made at an intersection with a driver traveling at ~ 40mph in the hope that this would result in a safety intervention, is at best frightening

NAEMT July 2006 Position statement

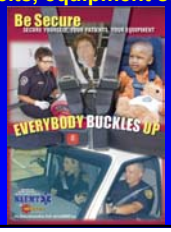


Policy makes a difference…

Organizational policy and other factors associated with emergency medical technician seat belt use

Jonathan R. Studnek [a,*], Amy Ferketich [b]

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



A very serious gap in data, performance and oversight

- FMCSA Truck safety goals – to decrease the fatality rate of 2.8 per 100 million truck-miles in 1996 to 1.65 by 2008
- EMS crash fatality rate estimates are – 7.66 - 41.93 fatalities per 100 million ambulance-miles

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

Thursday July 5th 2007……

Posted By:mad at July 5, 2007 4:38 PM (Suggest Removal)
to all the people worried about how fast the emt was going. would it be fast enough if it was your loved one in there.....

| Add your comments

Posted By:Concerned at July 5, 2007 4:49 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:Concerned at July 5, 2007 4:58 PM (Suggest Removal)
To X responder: Why can't I second guess this? A man is dead and I want to know if the actions and situation surrounding this were worth this sort loss. And I'd like to know what can be done so that this never happens again.

- "Ambulance transport has a death toll…. "

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

The 'accident' scenario…

- There were three personnel in the back of the ambulance plus the patient.
- The patient being treated had a self inflicted laceration with an arterial bleed to an upper extremity.
- The ambulance was traveling lights and sirens and moving slowly through an intersection when they were involved in a T-bone collision.
- They were struck on the passenger side of the vehicle near the rear of the box.

At the time of the 'accident'…

- The paramedic with the serious head injury was seated and un-restrained on the bench seat over the rear wheel well on the impact side of the vehicle.
- At the time of impact, the paramedic with the head injury had just finished starting an IV and he was discarding his needle in a wall mounted sharps container.
- A second Paramedic was standing at the head of the patient involved in an unknown activity. An EMT was standing near the front of the bench seat, holding direct pressure and elevating the patients arm upright.

The tip of the iceberg of the 'accident' outcome..

- The second paramedic and the EMT received minor soft tissue injuries only.
- The paramedic with the head injury was intubated for a short time and then extubated later that same evening.
- He is back to work after a couple of months off the job. He is not working as a paramedic yet, but he is back on the line as a chiefs aid until his doctor gives him permission to return to active duty status. He has been dealing with memory problems and the need to sleep for longer hours than normal.

Bigger is not necessarily better……

Occupant protection……?? July 2007

USA ambulance purchase specifications GSA:KKK-A-1822E, 2002

- Static Pull test
- 2200 Lbs. (8G's) in Longitudinal and Lateral
- No dynamic test
- No definition to manikin mass
- No restraint for equipment
- Voluntary

KKK – static 'safety testing'

- Ignorant of automotive safety principles – and specifies -
  - No structural damage to any load bearing or supporting members, i.e., torn or broken material, broken welds, popped or sheared body rivets, bolts, and/or fasteners, shall be evident during the application of the force and after the release of the force.

Unacceptable current 2007 USA ambulance '*safety testing*' practices !!??

F = ma

where F – force
m – mass
a – acceleration

Bottom line

- The AMD should consider revising the standard comprehensively to reflect current accepted automotive safety practice, given the current vehicle crashworthiness and occupant protection knowledge and published literature.

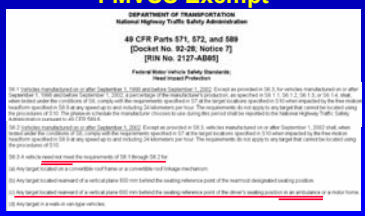
Common European Community (CEN) EN 1789:1999/A1:2003,

European Committee for Standardization

Medical vehicles and their equipment - Road Ambulances

- "Without exception, all persons, medical devices,equipment, and objects normally carried on the road ambulance shall be maintained to prevent them from becoming a projectile when subject to a force…"
- 50th percentile manikins - 10 G in Forward, Rearward, Transverse, & Vertical directions
- Certified by Notified Body and Ambulance Mfg.

USA Ambulances: FMVSS Exempt



DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration

49 CFR Parts 571, 572, and 589
[Docket No. 92-29; Notice 7]
[RIN No. 2127-AB85]

Federal Motor Vehicle Safety Standards;
Head Impact Protection

S8.1 Vehicles manufactured on or after September 1, 1998 and before September 1, 2002. Except as provided in S8.3, for vehicles manufactured on or after September 1, 1998 and before September 1, 2002, a percentage of the manufacturer's production, as specified in S8.1.1, S8.1.2, S8.1.3, or S8.1.4, shall, when tested under the conditions of S9, comply with the requirements specified in S7 at the target locations specified in S10 when impacted by the free motion headform specified in S9.3 at any speed up to and including 24 kilometers per hour. The requirements do not apply to any target that cannot be located using the procedures of S10. The phase-in schedule the manufacturer chooses to use during this period shall be reported to the National Highway Traffic Safety Administration pursuant to 49 CFR 585.6.

S8.2 Vehicles manufactured on or after September 1, 2002. Except as provided in S8.3, vehicles manufactured on or after September 1, 2002 shall, when tested under the conditions of S9, comply with the requirements specified in S7 at the target locations specified in S10 when impacted by the free motion headform specified in S9.3 at any speed up to and including 24 kilometers per hour. The requirements do not apply to any target that cannot be located using the procedures of S10.

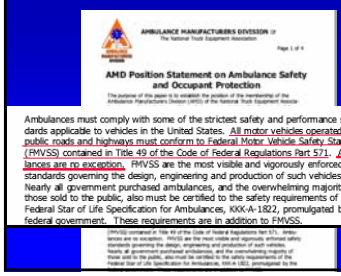
S8.3.4 vehicle need not meet the requirements of S8.1 through S8.2 for:

(d) Any target located on a convertible roof frame or a convertible roof linkage mechanism.

(b) Any target located rearward of a vertical plane 600 mm behind the seating reference point of the rearmost designated seating position.

(c) Any target located rearward of a vertical plane 600 mm behind the seating reference point of the driver's seating position in an ambulance or a motor home.

(d) Any target in a walk-in van-type vehicles.



AMBULANCE MANUFACTURERS DIVISION OF
The National Truck Equipment Association

Page 1 of 4

AMD Position Statement on Ambulance Safety and Occupant Protection

The purpose of this paper is to establish the position of the membership of the Ambulance Manufacturers Division (AMD) of the National Truck Equipment Associa-

Ambulances must comply with some of the strictest safety and performance standards applicable to vehicles in the United States. All motor vehicles operated on public roads and highways must conform to Federal Motor Vehicle Safety Standards (FMVSS) contained in Title 49 of the Code of Federal Regulations Part 571. Ambulances are no exception. FMVSS are the most visible and vigorously enforced safety standards governing the design, engineering and production of such vehicles. Nearly all government purchased ambulances, and the overwhelming majority of those sold to the public, also must be certified to the safety requirements of the Federal Star of Life Specification for Ambulances, KKK-A-1822, promulgated by the federal government. These requirements are in addition to FMVSS.

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Most trucks, SUVs do poorly in whiplash test

54 current models - or two-thirds of all the vehicles in the test - fail to adequately protect occupants in rear-end collisions.

July 3 2007: 10:17 AM EDT

NEW YORK (CNNMoney.com) – Two-thirds of pickups, vans and sport-utility vehicles don't provide acceptable protection against whiplash in rear-end collisions, according to tests by the Insurance Institute for Highway Safety (IIHS).

Some 54 models were rated "marginal" or "poor" by the Institute in tests that involved measurements of seats and head restraints and, in some cases, simulated rear-end collisions.

Vehicle seats and head restraints are first measured to determine if the headrest, because of its shape and angle, is likely to provide adequate protection.

IIHS: Top Safety Picks

Seats that are deemed likely to provide good protection are then tested in a simulated crash. The seat is attached to a moving platform that is struck from behind at 20 miles per hour. The Institute then measures impact forces on a crash-test dummy riding in the seat.

Twenty-one current models – or 24 percent of those tested - earned the best possible rating of "Good." Twelve models earned an "Acceptable" rating, the second-best rating.

"In stop-and-go commuter traffic, you're more likely to get in a rear-end collision than any other crash type," says IIHS's David Zuby. "It's not a major feat of engineering to design seats and head restraints that afford good protection in these common crashes."

Video

CNN's Greg Hunter reports on the latest testing of seats and head restraints in SUV's.

Play video

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Colorado ambulance safety thrust in spotlight

News Report

Page Last Updated: Tuesday, May 16, 17:20 PST

05/16/2006 | Print Report | EMail Report to a friend |

Colorado ambulance safety thrust in spotlight

A pair of ambulance crashes in little more than a week have left three people dead in Colorado. State health officials plan to make ambulance safety a key issue in the coming weeks. JEMS is highlighting a series of news stories about the incidents and an article from the November 2003 issue of JEMS that details a common-sense approach to staying safe while riding in an ambulance.

Full Story

A closer look

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

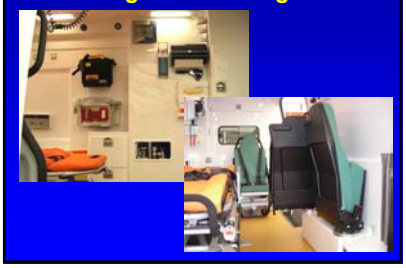
Major events for innovation sharing
– but regional and often language isolation

Vehicle Occupant Safety design

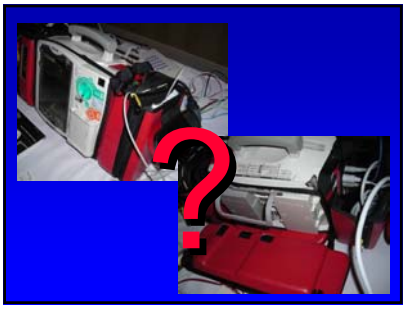
2007 European design

Safety technology is a key focus

Ergonomic design



Securing equipment



Ergonomic layout and equipment

Policy Changes

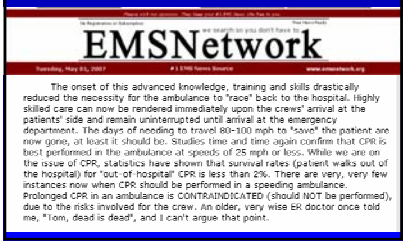
Safety leadership… from the IAFC and USFA

IAFC NEWS ALERT
FOR IMMEDIATE RELEASE
Contact: IAFC Communications Department
International Association of Fire Chiefs
703/273-0911
www.iafc.org

The IAFC and the USFA Develop Model Policy and Procedures Guide for Emergency Vehicle Safety

Fairfax, Va., October 20, 2006… The International Association of Fire Chiefs (IAFC) and the Department of Homeland Security's United States Fire Administration (USFA) announce the release of a *Guide to Model Policies and Procedures for Emergency Vehicle Safety*. This innovative, web-based educational program is aimed at reducing the impact of vehicle related incidents on the fire service and the communities they protect. The guide provides in-depth information for developing policies and procedures required to support the safe and effective operation of all fire and emergency vehicles, as well as privately-owned vehicles, which are the leading cause of volunteer firefighter on-duty fatalities responding and returning to emergencies.

CPR?

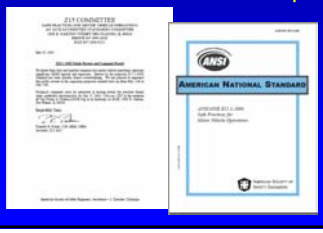


EMSNetwork

The onset of this advanced knowledge, training and skills drastically reduced the necessity for the ambulance to "race" back to the hospital. Highly skilled care can now be rendered immediately upon the crews' arrival at the patients' side and remain uninterrupted until arrival at the emergency department. The days of needing to travel 80-100 mph to "save" the patient are now gone, at least it should be. Studies time and time again confirm that CPR is best performed in the ambulance at speeds of 25 mph or less. While we are on the issue of CPR, statistics have shown that survival rates (patient walks out of the hospital) for "out of hospital" CPR is less than 2%. There are very, very few instances now when CPR should be performed in a speeding ambulance. Prolonged CPR in an ambulance is CONTRAINDICATED (should NOT be performed), due to the risks involved for the crew. An older, very wise ER doctor once told me, "I can, dead is dead", and I can't argue that point.

American National Standard ANSI/ASSE Z15.1-2006

Safe Practices for Fleet Motor Vehicle Operations



Z15 COMMITTEE

ANSI

AMERICAN NATIONAL STANDARD

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

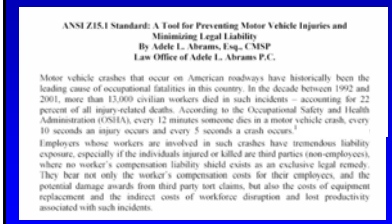
Z15 Incident Rates

- Incident rate based on number of vehicles operated:
  Incident rate = $\frac{\text{Number of incidents x 100}}{\text{Number of vehicles}}$
- Incident rate based on vehicle mileage:
  Incident rate = $\frac{\text{Number of incidents x 1,000,000}}{\text{Vehicle mileage}}$
- Injury incident rate based on vehicle mileage:
  - Injury incident rates, the most frequently used indicator of incident severity, are useful for tracking events that have the potential to affect financial or operational performance of the operating unit.

  Injury incident rate = $\frac{\text{Number of incidents with injury x 1,000,000}}{\text{Vehicle mileage}}$
- Incident rates based on service activity:
  - Motor vehicle operations that pose injury risks other than those associated with driving should also use the service activity as the basis of a safety performance rate. The number of deliveries, stops, or loads should be considered as appropriate indicators of performance.

  Incidents per 10,000 transports = $\frac{\text{Number of incidents x 10,000}}{\text{Number of transports}}$
- Vehicle injury rates based on work hours:
  Vehicle incidents per 200,000 hours = $\frac{\text{Number of incidents x 200,000}}{\text{Number of hours worked}}$

Legal Perspectives on Z.15



ANSI Z15.1 Standard: A Tool for Preventing Motor Vehicle Injuries and Minimizing Legal Liability
By Adele L. Abrams, Esq., CMSP
Law Office of Adele L. Abrams P.C.

Motor vehicle crashes that occur on American roadways have historically been the leading cause of occupational fatalities in this country. In the decade between 1992 and 2001, more than 13,000 civilian workers died in such incidents – accounting for 22 percent of all injury-related deaths. According to the Occupational Safety and Health Administration (OSHA), every 12 minutes someone dies in a motor vehicle crash, every 10 seconds an injury occurs and every 5 seconds a crash occurs.[1]

Employers whose workers are involved in such crashes have tremendous liability exposure, especially if the individuals injured or killed are third parties (non-employees), where no worker's compensation liability shield exists as an exclusive legal remedy. They bear not only the worker's compensation costs for their employees, and the potential damage awards from third party tort claims, but also the costs of equipment replacement and the indirect costs of workforce disruption and lost productivity associated with such incidents.

EMS Specific Z.15…..

TransActions

ANSI/ASSE Z15.1-2006 Motor Vehicle Operations Standard Approved

http://www.objectivesafety.net/TransActions%20Z15.pdf

State Strategic Highway Safety Plans

Integration and Collaboration

Integration and Collaboration

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

New York State
Strategic Highway Safety Plan
2006-2007

VISION

New York's safety community will continue to work to ensure that its customers -- those who live, work and travel in New York State - have a safe, efficient, balanced and environmentally sound transportation system, and that safety is appropriately considered in all education, enforcement, engineering and emergency medical services activities in New York State in order to reduce fatal and injury crashes.

GOALS

Reduce motor vehicle fatalities from 1,410 in 2005 to 1,285 in 2011

Reduce the Fatal Crash Rate/100 Million VMT from 1.00 in 2004 to .90 in 2011

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

- **EMERGENCY MEDICAL SERVICES DISPATCH SERVICES**
- **EMERGENCY MEDICAL SERVICES PARTNERSHIPS**
  - Increase the participation and role of Regional EMS Councils in local and regional highway traffic safety boards and/or organizations
- **PRE-HOSPITAL TRAINING PROGRAMS**
  - Train EMS providers in the use of the new medical protocols; provide funds and/or other support to certified EMS Course Sponsors to train EMS providers in the use of these protocols; and collaborate with Regional EMS Councils and/or Regional Emergency Medical Advisory Committees (REMAC) on the development and implementation of training programs
- **ROAD CONDITION AND INCIDENT RESPONSE**
  - Provide a placeholder for regional and/or county EMS representatives in municipal DOT emergency management plan development and implementation

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

- **EMS RESPONDER CRASH PREVENTION**
  - Undertake a systematic review of other state actions and protocols on ambulance traffic safety measures to identify and prioritize those appropriate for the New York State pre-hospital system
  - Increase education and involvement of EMS providers in principles of appropriate traffic safety techniques
  - Develop and implement ambulance traffic safety protocols at state, regional and service level
  - Review treatment modalities and protocols to identify those that may contribute to injuries resulting from the impact of ambulance crashes
  - Identify methods to provide incentives for adoption by EMS services of protocols that enhance traffic safety
  - Partner with organizations that provide public driver awareness and education campaigns to improve driver awareness of driver responsibility and appropriate response to approaching emergency vehicles

EMS Best Practice, Sept 2006

...sonnel Not Buckling up

News we don't want to see

Jan 22, 2007 6:39 am US/Eastern

Caught On Video: EMT Struck By Car

Lou Young
Reporting

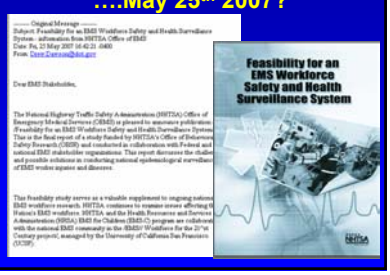
(CBS) BRONX The car hit 46 year-old Capt. Steven Quirindongo so violently it smashed the vehicle's windshield and sent him flying through the air.

Quirindongo, a 19-year veteran of the city's emergency medical services, was on the scene of a fire on Riverdale Avenue in the Bronx Sunday afternoon when a civilian car moved past police barricades and caught him from behind. Chief Wayne McPartland was on the scene as the damaged health food store where his men had successfully put out the flames.

"We had two firefighter minor injuries," he told us, "and they were taking care of our men and when he (Quirindongo) was walking back to the ambulance he was struck by the civilian vehicle.

.....May 21st, 2007, Seattle

....May 25th 2007?



Help is on the way ???
November 24th 2008

This looks cool AND SAFE!

Not rocket science..

New EMS helmet prototypes for 2006-2007

Problems

- No Standards
- Unique safety and hazard protection needs
- A number of <u>less than appropriate</u> devices out there

EMS has unique head protection needs – not well met by a 'truncated' fire helmet…

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???

It isn't like this outside of the USA

Safety at the scene

eg: Scandinavia Innovation in Vehicles, and Equipment

Knowledge Transfer?

TRB TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

Active Projects

(all due early 2007)

- Commercial Motor Vehicle Driver Training Curricula and Delivery Methods and Their Effectiveness
- Commercial Motor Vehicle Carrier Safety Management Certification
- The Role of Safety Culture in Preventing Commercial Vehicle Crashes
- The Impact of Behavior-Based Safety Techniques on Commercial Motor Vehicle Drivers
- Health and Wellness Programs for Commercial Motor Vehicle Drivers

The truck and bus industry is on the right track…. Where is EMS??

What about FMCSA's Mission

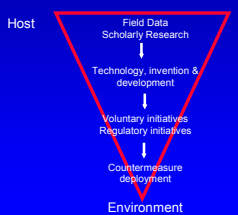
- Office of Research and Analysis is committed to reducing the large truck-related fatality rate from 2.8 per 100 million truck-miles in 1996 to 1.65 by 2008.

Mission

- The mission of FMCSA's Office of Research and Analysis is to reduce the number and severity of commercial motor vehicle (CMV) crashes and enhance the efficiency of CMV operations by:
  - Conducting systematic studies directed toward fuller scientific discovery, knowledge, or understanding
  - Adopting, testing, and deploying innovative driver, carrier, vehicle, and roadside best practices and technologies
  - By expanding the knowledge and portfolio of deployable technology, the research and technology program will help FMCSA reduce crashes, injuries, and fatalities and will deliver a program that contributes to a safe and secure commercial transportation system.

What type of passenger carrier do you need ?

Automotive Injury Triangle and Safety Development



Protective devices/concepts

To prevent a crash

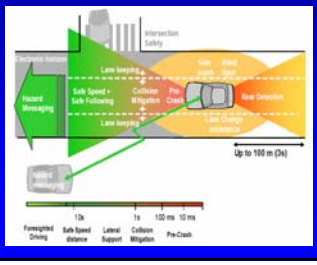
- Driver feedback
- Driver monitoring
- Driver training
- Vehicle Intelligent Transportation System (ITS) technologies
- Tiered dispatch
- Appropriate policies

In the event of a crash

- Vehicle crashworthiness
- Seat/seat belt systems
- Equipment lock downs
- Padding
- Head protection

Tiered Dispatch

Intelligent Transport Safety Systems



Back up Camera….. Shouldn't all vehicles have one of these?

The "Black Box"

Driver behavior monitoring and feedback device

The "Black Box" - A transportation safety monitoring and feedback device

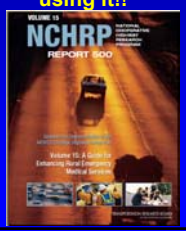
This technology is conceptually like a vehicle safety 'pulse oximeter' – that with auditory feedback - can save your life, your coworkers life, your patients life, and others on the road

Purpose of 'Black box' Program

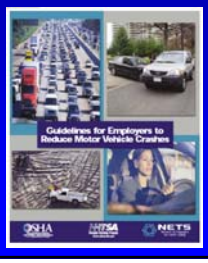
- Enhance Safety
- Improve Driver Performance
- Save Maintenance Dollars
- Aid Accident / Incident Investigation

Tips for Emergency Vehicle Operations

Transportation Research Board is an excellent resource… we should be using it!!



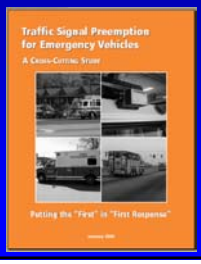
No need to reinvent the wheel...



USFA Emergency Vehicle Safety Initiative

March 2007 - FHWA

Data, but is it generalizable



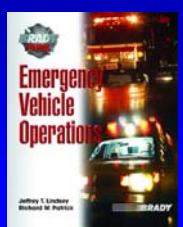
Healthcare Safety

- Importance of safety as an organizational value
- Proactive approaches to safety management and leadership
- Prevention of accidents, injuries
- Presents authoritative data from OSHA, EPA, NFPA, NRC, and JCAHO
- ? EMS Transport Safety? – Not a mention

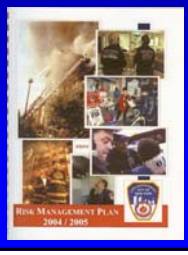
Sit Down for EMS Safety!

VFIS Summer 2006

Where is transport research ?



FDNY a leader in safety

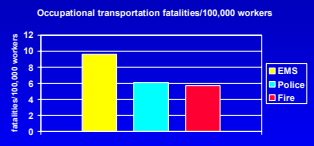


Ambulance Driver Safety - Australia

Fleet Driver Training..

Dynamics of Fleet Safety - NSC

Occupational transportation fatalities..



▶WE HAVE A BIG PROBLEM HERE

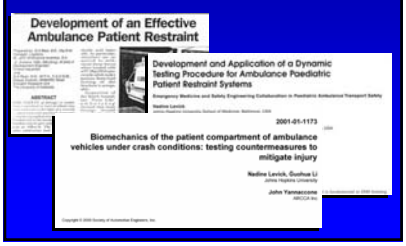
** Maguire, Hunting, Smith & Levick, Occupational Fatalities in Emergency Medical Services: A Hidden Crisis, Annals of Emergency Medicine, Dec 2002*

A few weeks ago….

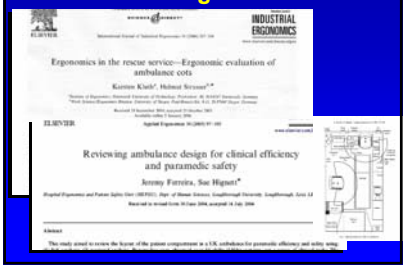
http://www.objectivesafety.net

Ambulance Safety Research: A New Field

We should use the best safety practices demonstrated in engineering

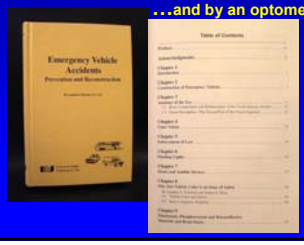


and in ergonomics



The first and only published scientific text on ambulance crashes (1995)

…and by an optometrist



We've known for 10 years that red fire trucks are twice as likely as lime yellow trucks to crash at an intersection

Fire Trucks Are Supposed To Be Red, Right? Not If You Want To Reduce Accidents

Picture a fire truck and you are likely to see red – fire engine red. But when it comes to safety, human factors and ergonomics research paints a different picture

Lime-Yellow Fire Trucks Safer Than Red -- A Conclusion from Four Years of Data

Classic emergency vehicles--red fire engines--may be more dangerous for the public and for firefighters than lime-yellow fire engines. Tabulation and review of data from Dallas, Texas produced the following conclusion:

If other factors are the same, the probability of a visibility-related accident for a red or red/white pumper is greater than the probability for a lime-yellow/white pumper. . . Lime-yellow/white fire pumpers are significantly statistically safer than red and red/white fire pumpers.

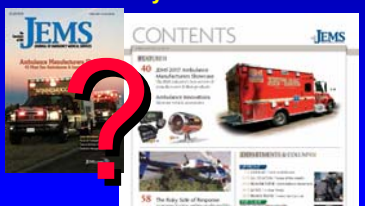
Science not, next best guess

Ambulance Safety Research: A New Field

- Funding??

DOT Funding for Reptiles and Road Kill

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



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

Vehicle design and safety

- The principles of automotive safety involve a complex science, engineering technical skill, expertise, training and knowledge
- "Give the engineers a working list of our needs and let them tell us how it should be built to accomplish those tasks….."

John Russell MD, Advisory Panel, EMS Safety Foundation, 2007

The squad bench??

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

and those rock climbing harnesses??

The squad bench…?

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 sidefacing occupants are potentially lethal – and is in NO WAY SUPPORTED BY ANY DATA OR AUTOMOTIVE SAFETY EXPERTISE

PPE from the stationary environment can be highly hazardous in the automotive setting

Key Testing issues..

- In both the military and the automotive industry being ambulant in a moving ground vehicle or crash, in any device, is a dangerous practice and is not supported
- Use of current 'seated' crash dummies to demonstrate that such ambulatory devices may be safe is a fallacy, and misleading

Were we safer in the Cadillac???

Current fleet

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

Future

- Vehicle design
- PPE
- Practice policy
- Data/Monitoring/Oversight

Current and Future Research

- Epidemiology
- Ergonomic hazards
- PPE & Head protection
  (Bio/Chem/Radiation hazard)
- Transport
  - Vehicle/Occupant automotive testing
  - Vehicle design innovation
  - Driver behavior (Real time and Simulated)
  - Intelligent Transportation Systems
- Operations tracking
- Data systems/reporting systems
- Enhanced Practice policies evaluation

Conclusion

- New Infrastructure
- New information
- New collaborations
- New events
- Innovation in safety technologies, strategies and policy
- Knowledge transfer
- Unacceptable mythology
- Challenges to advancing EMS transport safety

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