


NEW JERSEY
DEPARTMENT OF HEALTH
NEW JERSEY
OFFICE OF EMERGENCY MEDICAL SERVICES

NJ Statewide Conference on EMS
October 2-4, 2008
Atlantic City, New Jersey, October 3rd, 2008

**Ambulance Transport Safety:
Everything You Really Need
to Know**



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

▶ To quote Steve "Sid" Caesar –
Director IHS ES

"We want everyone to get home safely each day"

- 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?

<http://www.objectivesafety.net>



Firstly!

▶ **An accident ?**

▶ or
a predictable and preventable event

A tragic emergency health care intervention outcome



Rollover Crash Kills Medical Technician
Ambulance Rollover Kills EMS Worker

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.....

Creating a Safety Culture

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

- ▶ Awareness
- ▶ Training
- ▶ Incentive

Safety - Why now?

- ▶ Operating optimally in a transportation environment that is largely devoid of specific safety standards for the hazards and risks present
- ▶ Bridge the gap between what technical information exists and what is accessible and applied to EMS

EMS Safety

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

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

New Information 2006-2008

- ▶ Enhanced Safety of Vehicles (ESV), June 2007
- ▶ American Society Safety Engineers (ASSE), June 2006 & June 2007
- ▶ International Ergonomists Association (IEA), June 2006
- ▶ Transportation Research Board – EMS Safety address, Jan 2007
- ▶ AMD Engineering Public Comments, July 2007
- ▶ KKKF, August 2007
- ▶ OSHA September 11, 2007 Federal Register
- ▶ SAFETEA-LU, 2006
 - * (Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users)
- ▶ State Strategic Highway Safety Plans, October 2007
- ▶ State EMS Council Policies
- ▶ APHA, Nov 2007
- ▶ Transportation Research Board – Inaugural EMS Safety Subcommittee meeting Jan 2008
- ▶ NIOSH Emergency Responder Round table March 2008
- ▶ OSHA EMS best practices late 2008
- ▶ Worker visibility Act, to be implemented, Nov 2008

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

NEWS CENTER

Paramedic Killed in Turner Ambulance Crash

TURNER (NEWS CENTER) - The Allen County coroner was called when the ambulance involved in a serious crash Tuesday at 4:38 p.m. on State Road 1000 in Turner.

The ambulance driver, 38-year-old Allan Parson, of Turner, and the paramedic, 30-year-old Allan Parson, of Turner, were both killed and were taken to the Turner Medical Center, but the paramedic was pronounced dead at the hospital.

The paramedic who died has been identified as 38-year-old Allan Parson.

A section of Route 1000 is closed to traffic for about the hour.

Several patients are stopped to help the injured. Sheriff's investigators would like to talk with the driver. The crash occurred on the south side of the road just west of the Turner Medical Center. The ambulance was traveling east on State Road 1000 at 4:38 p.m. on Tuesday.



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

Posted By: concerned 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 4:19 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: concerned at July 5, 2007 4:08 PM (Suggest Removal)
to it is impossible, why don't you just get your hands off the wheel and I want to know if the actions and reaction surrounding this were worth this loss. 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

VAN WERT, Ohio (AP) — The Ohio State Highway Patrol continues to investigate the crash of an ambulance that killed five people Friday night, including three emergency medical technicians. Troopers say the ambulance was broadsided by a semitrailer in Crane Township, about 65 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 67. The ambulance then burst into flames.

The Highway Patrol says three EMS workers were killed. They were identified as 40-year-old Sammy Smith, 31-year-old Matt McCougl and 30-year-old Kelly Egan. The two patients were also killed. They were identified as 64-year-old Robert Neale, 60-year-old Amanda Neale of Wicksville.

Another emergency medical technician, Matt McCougl, and the truck driver, Gerald Chapman, Jr., 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 rural 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 M. Kelly
July 21, 2007



D. LOAN/KCIV
ANTWEP - The news is so awful...
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 Shuhert 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 it could happen at any time. We read about it in our newsletter. 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."

June 17th 2008 a paramedic and a patient killed

EMS CRASH KILLS PATIENT AND A SUSSEX COUNTY (DE) PARAMEDIC IN THE LINE OF DUTY

We regret to advise you that a female Sussex County (DE) Paramedic was killed on 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 12:40 Hours on the July 2, Williams Highway near the Leona Rehoboth just the company station in Angula.

The 360-Sussex Reserve Squad ambulance was transporting to Berkle Medical Center with a patient, 2 MERS 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 lower 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 Schaefer was seriously injured in a crash when a crane 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...



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 Stitt. Stitt 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...?"

Date Reported: Tuesday, January 15, 12:14 PM

0124847 | [Read the Article](#) | [Email this Article to a Friend](#) | 

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

By Elizabeth F. Ryan
The York Dispatch (Pennsylvania)
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An Adams County ambulance making a patient transfer to York Hospital collided with a car at the intersection of routes 20 and 212 in West Manchester Township at 9:47 this morning, and the patient was pronounced dead at the scene.

York County Deputy Coroner Claude Orsberry told the patient, a woman, was being transported from Sutterburg Hospital to York Hospital for a "significant" heart condition.

The van had 1000 lbs. in addition to what the driver said she had secured and placed prior to the crash, or whether she suffered a fatal heart attack because of or after the crash. Orsberry said she will be conducting an investigation into the crash.

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:

1960 to 2007

 A passenger vehicle - sure

 A 'laundry or mail truck' - ?

 A passenger vehicle - yes!

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

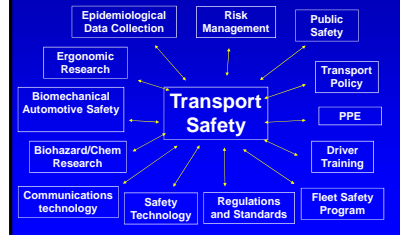
Some odd facts

- ▶ 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

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



USA 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

*NHTSA 2005-6

Is it your service's tragic year?

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

'Workplace' Hazards



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

Safety is Good Business



A problem

2007 Insurance data –

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

EMS CANNOT Afford to keep paying out like this....

A number of potential interventions to enhance safety have been identified:

- ▶ Safety Policy
- ▶ Safety performance standards
- ▶ Vehicle crashworthiness
- ▶ Vehicle interior ergonomics
- ▶ Personal Protective Equipment design
- ▶ Driver selection, training and simulation
- ▶ Safety and risk awareness modification
- ▶ Risk behavior modification
- ▶ Intelligent Transportation Systems (ITS)

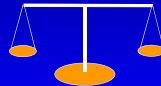
Benefit of Safety

- ▶ 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

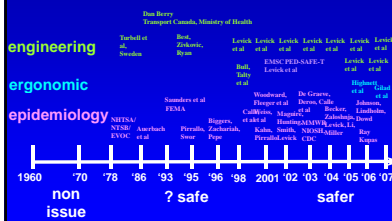


- ▶ Response and transport time
- ▶ Clinical care provision
- ▶ Occupant safety/protection
- ▶ Public Safety

Goals

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

Ambulance Safety Research: A New Field



Increasing awareness ...

EMS Best Practice, Sept 2006



It does happen....

But what about head protection?



New EMS helmet prototypes for 2008



Problems

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

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



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

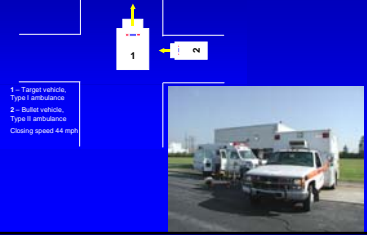
If we know this – and its published...



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

Full Vehicle Crash Testing

Test 1 – Right side impact



1 – Target vehicle
Type I ambulance

2 – Buller vehicle
Type II ambulance

Closing 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 !

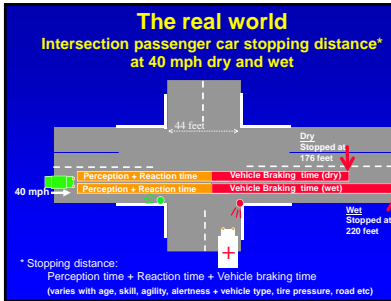
And very Predictable...

- ▶ 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.....



Ambulance Standards??

- ▶ KKK?
- ▶ AMD?
- ▶ FMVSS?
- ▶ NFPA?

USA KKK ambulance purchase specifications GSA:KKK-A-1822F, Aug 2007

- ▶ Specifications for the purchase of a Star of Life Ambulance
- ▶ Static Pull test
- ▶ 2200 Lbs. static stretcher test in longitudinal, lateral & vertical
- ▶ No dynamic test for vehicle, occupants or equipment
- ▶ No automotive test manikin
- ▶ Voluntary www.gsa.com/WorkArea/Content.aspx?DocID=1153



USA Ambulance Manufacturing Division (AMD) Ambulance Standards – August 2007

- ▶ No dynamic or impact test
- ▶ No automotive test manikin
- ▶ Mandates NO 'crumple zone'
- ▶ No impact tested anchorages for occupant restraint or equipment
- ▶ Internal, not independent



<http://www.aaa.com/WorkArea/Content.aspx?DocID=1130>

AMD 2007 - 025 'occupant safety testing'

- Compared with -
Accepted automotive safety occupant testing



AMD – static 'safety testing'

- ▶ Inconsistent with automotive safety principles – and specifies that a 'successful test' is -
 - 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.

Occupant protection.....?? July 2007



KKK certified and FMVSS exempt...?





No 'a'... then NO 'F' !!!!!

▶ **F = ma**

where **F** – force
m – mass
a – acceleration

Sir Isaac Newton (1642-1727), Philosophiæ Naturalis Principia Mathematica (Mathematical Principles of Natural Philosophy), published in 1687. http://en.wikisource.org/wiki/Newton's_Laws_of_motion

**USA Ambulances:
FMVSS Exemption**

DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
49 CFR Parts 571, 572, and 589
(Docket No. 92-28; Notice 7)
(RIN No. 2127-AB85)

**Federal Motor Vehicle Safety Standards,
Head Impact Protection**

§ 571.213 Specific construction on or after September 1, 2002...
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**NFPA Ambulance Standard
Development**

- ▶ NFPA Ambulance Standard Development Public Comment
- ▶ The Public Comment period for the development of the new NFPA Ambulance Standard – is open until October 15, 2008
- ▶ http://www.emssafetyfoundation.org/NFPA_Ambulance0001.pdf

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

The image shows the cover of JEMS magazine. A large red question mark is superimposed over the cover, which features various images of ambulances and emergency scenes. The magazine title "JEMS" is visible at the top.

**A few key words about restraint
systems...**

NOT new technical data...

The photograph shows a crash test dummy seated in a side-facing 4-point harness. A digital display above the dummy shows "5500 17".

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**

**NIOSH Ambulance Occupant Safety Crash
Testing**

The photograph shows a crash test dummy seated in an ambulance seat. A red arrow points to the right, labeled "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 sidefacing 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**



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

Innovation

Safety concepts out there now

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

The Driver

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

Driver issues

Journal of Emergency Medical Services, Volume 15, Number 1, February 2000

The Relationship Between Ambulance Crashes and Emergency Medical Technician Age

James S. Dinkler and Eric Stone
University of Wisconsin-Madison, Madison, Wisconsin; All City Fire Dept. Madison, Wisconsin

OBJECTIVE:

Objective: Ambulance crashes are a significant problem for the emergency medical services industry. This study was conducted to determine if there is a relationship between the age of the emergency medical technician (EMT) and the number of ambulance crashes. The study was conducted in Madison, Wisconsin, during the year 1997. The study was a retrospective study of ambulance crashes. The study was conducted in Madison, Wisconsin, during the year 1997. The study was a retrospective study of ambulance crashes.

Methods: A total of 100 ambulance crashes were analyzed. The study was conducted in Madison, Wisconsin, during the year 1997. The study was a retrospective study of ambulance crashes.

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.

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 Warrick
Michael E. Nagel
California Ambulance
United States of America
Paper Number 05-0234

Purpose of 'Feedback box' Program

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

How the Device Works

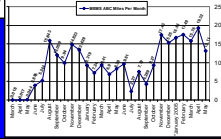
- ▶ Computerized monitoring device installed on each vehicle to measure parameters
- ▶ Each driver has individual key "fob"
- ▶ Data collected every second
 - including: vehicle speed and performance, driver behaviors and emergency mode
- ▶ Auditory feedback of warning 'growls', and penalty tones
- ▶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



Demonstrated Effectiveness



I – blind data, no grows
 II – grows & 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

The EMS Safety Foundation

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



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.

Vehicle Occupant Safety design

2008 European design
 Safety technology is a key focus

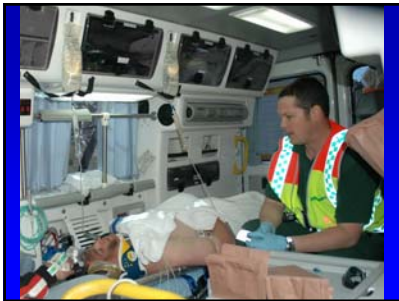


Ergonomic design



One patient or Two patients
and you can reach both AND
your equipment...

a fleet based initiative



Flexibility to manage two patients



Ergonomic layout and equipment



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



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



NAEMT July 2006 Position statement

**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 available safety restraint systems by government, industry, and all occupants of any emergency response vehicle.

Background

The NAEMT strongly advocates the development of significant scientific studies to determine appropriate restraint and proper solutions for the EMS provider, patient and emergency responder vehicles.

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

News we don't want to see

Jan 22, 2007 6:39 am US/Eastern

Caught On Video: EMT Struck By Car

Lois Young Reporting

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

Quindongo, 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 McFarland was on the scene as the damaged health food store where his men had successfully put out the flames.

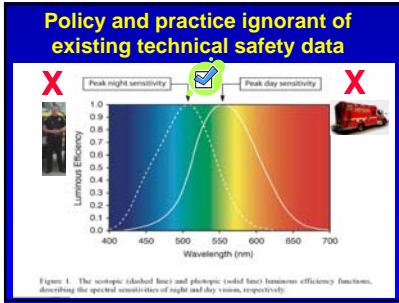
"We had two firefighter minor injuries," he told us, "and they were taking care of our men and when he (Quindongo) was walking back to the ambulance he was struck by the civilian vehicle."

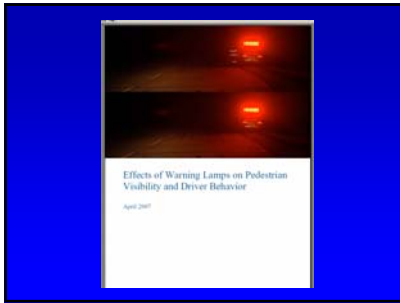
Worker visibility Act: Help is on the way !! November 24th 2008

PART 531—WORKER VISIBILITY § 531.2 R44.

531.2.1 Purpose. All workers within the right-of-way of a Federal-aid highway who are engaged in any activity which requires the use of reflective or reflective safety equipment within the work zone shall wear high-visibility safety apparel.

Workers must always wear reflective safety apparel when working within the right-of-way of a Federal-aid highway, such as highway construction and maintenance, utility crews, utility crews, and utility crews.





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

But whatever color If you run a red light some will be killed

Article: Don't Play Russian Roulette at Intersections
By [Name], Editor at Large, JEMS
[Date]

R & D "Ripoff and Duplicate"

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

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

Ambulance Safety Summit November 7th, 2008

- ▶ EMS Transportation Safety Subcommittee of the National Academies Transportation Research Board (TRB)
- ▶ Onsite panel of invited technical experts, in addition to policy makers and EMS leaders:
 - Safety data capture
 - Transport /fleet management, EMS vehicle operations
 - Automotive safety and occupant protection
 - Ergonomics and human factors
 - Standards
- ▶ Will be beamed live via Webinar and recorded electronically and TRB e-circular produced
- ▶ Access to live participation requires pre-registration
- ▶ Pre-registration info disseminated in early October

TRB Jan 2009 EMS Subcommittee Meeting and Seminar

- ▶ The Subcommittee on EMS Transportation Safety of the National Academies Transportation Research Board winter subcommittee meeting and seminar is in DC during the 2009 January TRB symposium
- ▶ Your input and participation (onsite or online) is valued
- ▶ You can submit your suggestions/input for the TRB EMS Subcommittee meeting online -
 - <http://www.emssafetyfoundation.org/TRBpriority.htm>

New NHTSA EMS info link

- ▶ There is a new Federal link to EMS info – a great resource!
- ▶ www.EMS.gov

www.GlobalEMSForum.org
 "Running Hot or Not" – Sept 27th, 9.30am EDT
 Previous
 Visibility and Standards Webinars

Ambulance Vehicle Safety Design Standards Around the World
 Global EMS Forum
 April 6th 2008

Daylight color sensitivity is very different, especially for blues and reds, at the ends of the spectrum

October 2008 JEMS Article "Rig Safety – 911"

Rig Safety 9-1-1
 What you need to know about ambulance safety & standards

No need to reinvent the wheel...

Guidelines for Employers to Reduce Motor Vehicle Crashes

OSHA NHTSA NETA

March 2007 - FHWA

Guidelines for Emergency Transportation Operations: Preparedness and Response

FHWA NHTSA

Tips for Emergency Vehicle Operations

Alive on Arrival
 Tips for Safe Emergency Vehicle Operations

NHTSA FEMA

USFA Emergency Vehicle Safety Initiative



Traffic Incident Management Systems (TIMS)

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



Risk/Hazards

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

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

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??**

Electronic handout available online
<http://www.objectivesafety.net>

