

33rd Annual EMS Symposium
Anchorage, Alaska, November 13-14th, 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"*

Here we are!



Where am I really from?
... Yes, it IS that big!



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?

Your Interactive Handout
awaits you online at...

▶ www.objectivesafety.net

This WILL be FAST!!
**No need to take any notes – all text
slides will be awaiting you in your
online Handout**

<http://www.objectivesafety.net>



Firstly!

▶ **An accident ?**

- ▶ or
a predictable and preventable
event

A tragic emergency health care intervention
outcome



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.....

Ambulance Transport Safety

- ▶ Emergency care, public health, public safety, and patient transportation.
- ▶ Important Principle: Ambulance transport safety is part of a system, the overall balance of risk involves the safety of all occupants and the public
- ▶ All get home safely

In a nutshell

- ▶ Am here to try to save you Lives Time and Money

October 2008 JEMS Article "Rig Safety – 911"



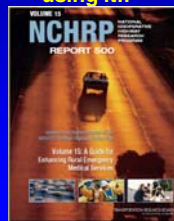
Breaking News!! National Academies TRB EMS/Medical Transport Safety Summit – November 7, 2008



The TRB and EMS

- ▶ **TRB Mission:** To provide leadership in transportation innovation and progress through research and information exchange, conducted within a setting that is objective, interdisciplinary, and multi modal.
- ▶ Provides service to government, public, and scientific and engineering communities.
- ▶ **TRB Goals:**
 - Being prepared for challenges.
 - Conduct and promote knowledge.
 - Provide timely and informed advice.
 - Act as an effective and impartial forum.
 - Promote collaboration.
 - Contribute to the professional development
 - Conduct and promote communications efforts.
 - Contribute to public's understanding.
 - A resource to the nation and to the transportation community worldwide

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




October 28, 2008 - Air EMS on NTSB's Most Wanted List...



Arteson fire chief says, "They were doing what they loved..."

Lisa Hickey
http://www.fox.com



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 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."

This is not a crashworthy environment



Jan 28th, 2008

Monday, January 28, 2008 10:14 AM

1 dead, others injured in Sussex crash involving ambulance



Collision happened at the intersection of Beaver Dam and Indian Mission roads near Angola Launch



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 Ryover to the Fallsades Center mall.

Sonnet James, 20, 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 Drepper said. "She appeared to be seriously injured."

The paramedic van driver, 59-year-old Scott Thera to Westchester Medical Center, said



April 20, 2008...??

CHILD injured after being struck by ambulance

Springfield boy hit by ambulance dies

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

This single-vehicle crash happened around 10:40 Hours on the John J. Williams Highway near the Levens Subdivison just few company's subdivision in Angola.

The 56th Sussex Rescue Squad ambulance was transporting to Berke Medical Center with a patient, 2 NRES 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 in 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.




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



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

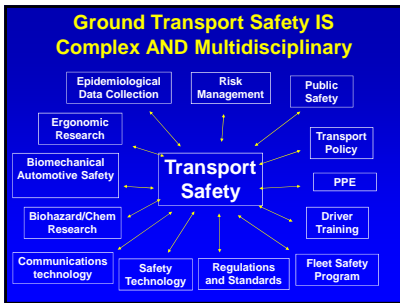
Some odd facts

- ▶ 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

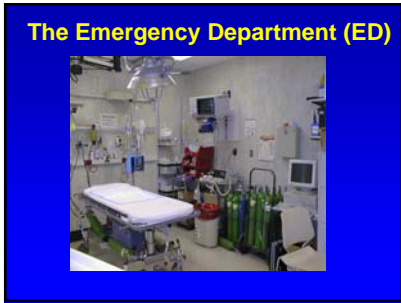




- ### Safety oversight of what and by whom
- ▶ Vehicle Safety
 - ▶ Vehicle Design
 - ▶ Transportation systems safety
 - ▶ Safety Equipment Design
 - ▶ Vehicle and Safety Equipment Testing and Standard development
 - ▶ Safety policies



- ### 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
- TIME
↓
&
PLACE



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

- ### 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

So for EMS personnel...

- ▶ What's going to kill you?
- ▶ What's going to injure you?

'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

* Maguire, 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

'Real world' head-on post crash



Anchor Daily News

Paramedic injured in crash is recovering

By Julie O'Neil
Published: December 20, 2006 at 05:01 AM

An Anchorage Fire Department ambulance rushing a patient to the hospital was struck by a Dodge pickup the morning, injuring three paramedics, according to the Anchorage Police Department.

The Dodge broadsided the ambulance, which had lights flashing and sirens on, hitting it in the back around 8 a.m. as the medic vehicle was crossing the Glenn Highway at Airport Heights Drive. Onboard the ambulance were seriously injured patient Antonio Matkovic, his wife, Gal Matkovic, and four Anchorage Fire Department personnel: driver Eric Tustin, 23, EMT Jena Warner, 40, and paramedics Dave Waldman, 43, and Tom Bruggler, 36.

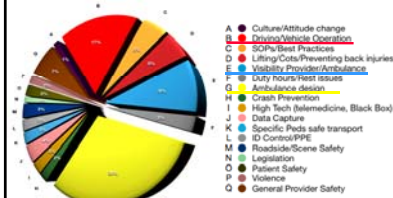
Bruggler, who was riding with Matkovic in the back of the rig, was hospitalized with a head injury and is in stable but guarded condition. Warner and Waldman were treated for minor injuries and hospitalized along with the driver of the pickup and



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

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

Key Safety Priority areas of focus n = 155



Safety is Good Business



June 2007

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 ?

Problems

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



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...



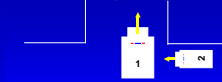
Levick NR, et al. Development and Application of a Dynamic Testing Procedure for Ambulance Pediatric Restraint Systems, SAE Australasia 1998;58:2:45-51

Why do we do this?



Full Vehicle Crash Testing

Test 1 – Right side impact

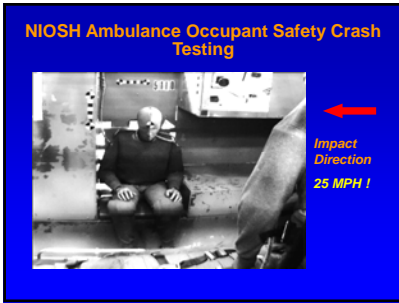


1 - Target vehicle
Type I ambulance
2 - Barrier vehicle
Type II ambulance
Closing speed 44 mph





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

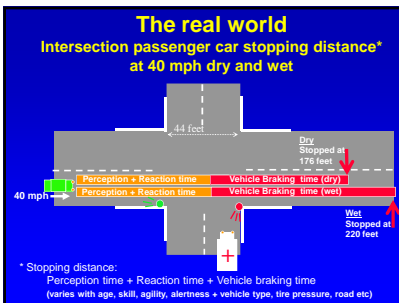


And very Predictable...

- ▶ 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??

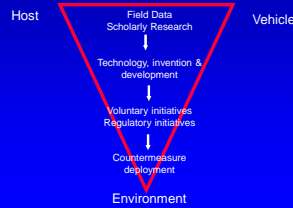
- ▶ KKK?
- ▶ AMD?
- ▶ FMVSS?
- ▶ NFPA?

What KKK-A-1822F, AMD and FMVSS state and don't state...

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

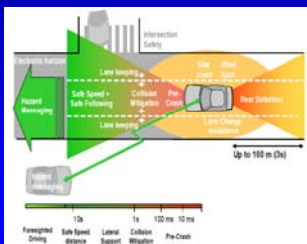
Automotive Injury Triangle and Safety Development



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

Intelligent Transport Safety Systems



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



A few key words about restraint systems...

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

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

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

JEMS and EMS Responder ARE NOT automotive safety journals

- ▶ And the reviews in them are completely inappropriate, misleading and outside of what is known in automotive safety
- ▶ We should NOT TOLERATE this as it is both completely irresponsible and very dangerous

Innovation

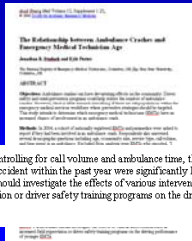
Safety concepts out there now

- ▶ 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



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
Obscura Safety LLC
United States of America
Larry Wieruch
Michael E. Nagel
California Ambulance
United States of America
Paper Number 050224

Purpose of 'Feedback box' Program

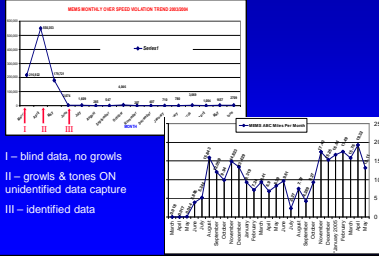
- ▶ Enhance Safety
- ▶ Improve Driver Performance
- ▶ Save Maintenance Dollars
- ▶ Aid Accident / Incident Investigation

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



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 in-service 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

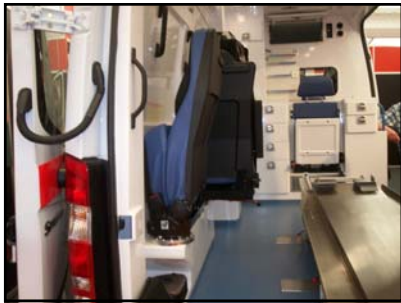
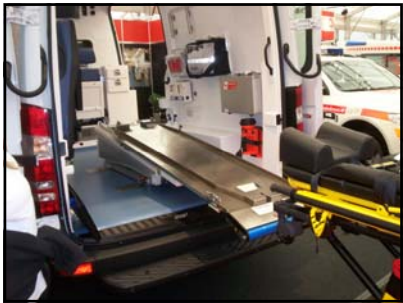


International approaches

- ▶ 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.

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

RETTmobil 2008
 zusammen mit dem 5. Deutschen Feuerwehrtag
 19.09. - 20.09.2008 - 14. bis 17. Mai 2008
 Die europäische Leitmesse für Rettung und Mobilität



Vehicle Occupant Safety design

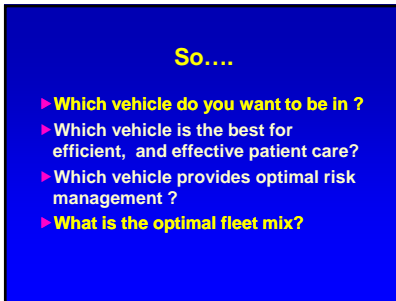
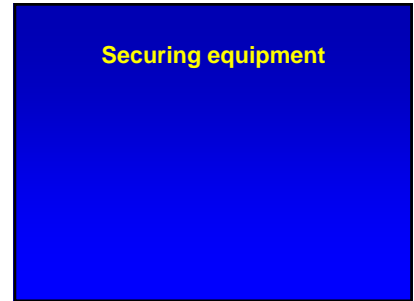
2008 European design
 Safety technology is a
 key focus

Ergonomic design



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

a fleet based initiative





- ### 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



- ### 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???

News we don't want to see

Jan 22, 2007 6:39 am US/Eastern

Caught On Video: EMT Struck By Car

Lisa Young Reporting

(CBS) BROWNSVILLE 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 Riverside 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."

This looks cool AND SAFE!



This is AWESOME – and addresses some very real risks, very creatively – and currently ONLY available in London Ontario!



- ▶ 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



**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

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", "Being Seen at the Scene" and "Ambulance Standards" Webinars

A collage of images related to ambulance safety webinars. It includes logos for TÜV, EMS Forum, and various documents. One document is titled "Ambulance Vehicle Safety Design Standards Around the World" and another is "Running Hot or Not? Exploration of practice, challenges and benefits". There is also a small graph showing "Daynight color sensitivity is very different, especially for blue and red, at the ends of the spectrum".

No need to reinvent the wheel...

Cover of a report titled "Guidelines for Employers to Reduce Motor Vehicle Crashes". The cover features images of a road with many cars and a person driving. Logos for OSHA, NHTSA, and NIOSH are visible at the bottom.

March 2007 - FHWA

Cover of a report titled "Emergency Transportation Operations: Preparedness and Response". The cover features images of emergency vehicles and personnel. It is a report from the U.S. Department of Transportation, Research and Innovative Systems Administration.

Tips for Emergency Vehicle Operations

Cover of a report titled "Alive on Arrival: Tips for Safe Emergency Vehicle Operations". The cover features an image of an ambulance. It is a report from FEMA.

USFA Emergency Vehicle Safety Initiative

Cover of a report titled "Emergency Vehicle Safety Initiative". The cover features an image of a fire truck. It is a report from FEMA.

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

Cover of a report titled "Traffic Incident Management Systems". The cover features an image of an emergency vehicle at an incident scene. It is a report from FEMA.

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>

