

Liberty Health Symposium,
September, 2nd, 8th & 9th, 2009

How to Arrive Alive - EMS Fleet Safety
**The Ride of Your Life:
Managing the Risks and Hazards
of Ambulance Transport**



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"*

Outline

- I. Review of data on ambulance crashes and safety standards and guidelines that exist for the ground EMS
- II. Identification of ground EMS transport safety issues, hazards and areas of risk to patients, providers and public
- III. Highlight unacceptable mythology and challenges to advancing EMS transport safety
- IV. Profile innovation, new safety technologies and strategies and knowledge transfer to enhance safety and reduce risks of ground EMS and patient transport

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?

Emergency Medical Service Transport

- ▶ What are the transport safety issues that pertain to this important public service and public safety industry?
- ▶ What do we know of the risks and hazards and how can we measure these ?
- ▶ How can the safety of this transport system be optimized?

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

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

October 2008 JEMS Article "Rig Safety – 911"



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 2006-6

Is it your service's tragic year?

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

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

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



What is a survivable impact ?



12 mph (20 km/hr)?



What is a survivable impact?

$$E = \frac{1}{2} mv^2 \quad v^2 = 2as$$



~ 30 mph - survivable



What is a survivable impact?

$$E = \frac{1}{2} mv^2 \quad v^2 = 2as$$



~ 60 mph - not survivable



A survivable impact??



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

NEWS CENTER

Paramedic Killed in Turner Ambulance Crash

News Center - Monday, July 02, 2007 10:56 AM
Source: NewsCenter.com
Source: NewsCenter.com

Published: 07/02/2007 10:56 AM - The West Coast ambulance crew killed when the ambulance collided with a private bus in a crash that killed a paramedic.


The West Coast ambulance crew killed when the ambulance collided with a private bus in a crash that killed a paramedic.

The ambulance driver, 35-year-old Adam Peterson of Central Washington State, was killed in the crash. The ambulance was carrying two patients and a paramedic. The ambulance was carrying two patients and a paramedic.

The paramedic who died has been identified as Allan Parson of Westport, Oregon.

A number of people it was reported to be about the hours.

Several people are reported to have been injured. Several people are reported to have been injured. Several people are reported to have been injured.



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

Posted By: user on July 5, 2007 4:58 PM (Suggest Removal)
to all the people worried about how fast the emt was going, would it be
last, enough if it was your loved one it there.....

Add your comments

Posted By: user on July 5, 2007 4:59 PM (Suggest Removal)
to mad: it would be too fast if they ran over my family member on their
way to another's family member...

Add your comments

Posted By: user on July 5, 2007 4:58 PM (Suggest Removal)
In X responder: Why can't I see this? A man is dead and I want
to know if the actions and situation surrounding this was worth the
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 Coate Township, about 65 miles southwest of Toledo.

Another emergency medical technician, Matt McCougal, 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 road intersection nor have they said if the ambulance's emergency siren and lights were turned on.


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 07. The ambulance then burst into flames.

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

Live! NBC 25
July 21, 2007

By: NBC 25

Antwerp Fire Chief Says: "They were doing what they loved..."



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."

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 as was a patient killed in a horrific crash involving an ambulance in Sussex County (DE) this morning.

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

The M4-Sussex Rescue Squad ambulance was transporting to Berbe 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 home page. Tragically, the patient was killed as was the Sussex County EMS Paramedic, who was killed in the Line of Duty.

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

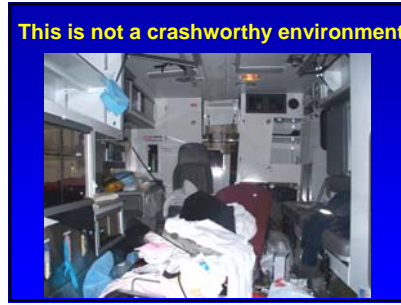




January 10, 2008



Livingston County News
Basic: 25¢/copy
AMBULANCE ROLLS, INJURING 4

Made on the road with a strong return as Strong



Jan 28th, 2008

Monday, January 28, 2008 10:14 am
[Top Story](#) | [Previous Top Stories](#) | [Our Picks](#) | [Today's Pick](#)

Posted at 7:33 am 13 Comments

1 dead, others injured in Sussex crash involving ambulance



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



October 31, 2008 - Kentucky



February 11, 2009 – North Carolina

EMS Driver Charged After Ambulance Crash - North Carolina

A Rockingham County ambulance did off the road and ripped over Wednesday afternoon.

The crane was transporting a patient to a nursing home when the ambulance veered off the road. The County Emergency Services Director Steve says the weather may have played a role in the crash. He said a driver, when he dropped off the patient to correct a fault on him, so you know he was just an overconfident trying to take the road and everything else was okay. They have never a factor.



April 30, 2009 - Tennessee



Arlington, Texas – June 18, 2009

Paramedic, woman involved in ambulance crash in Arlington - Texas

A paramedic and a pregnant woman were taken to a hospital after their ambulance collided with a truck in Arlington early this morning.

The ambulance was heading west on East Johnson Lane when it collided with a pickup going north on South Coble Street about 7 a.m. and the driver, a 36-year-old woman, was killed.

The ambulance was responding to a non-emergency call and did not have its lights or siren on, he said.

City public safety, 6886 declined to release details about the woman, but an Arlington police dispatcher said she was in labor.

Two ambulance arrived at the crash scene. The paramedic and woman were taken to the Medical Center of Arlington and have been released without injuries.

What they were shaken up a little, but they're OK," 6886 said. The drivers of both vehicles refused treatment.

Arlington police were investigating the cause of the accident.

Minnesota - June 20, 2009

Woman Struck, Killed By Ambulance In St. Paul - Minnesota

The ambulance, along with other emergency responders, was at a Walgreens parking lot in St. Paul responding to a report of a car that had gone through a fence and into an alley.

When the ambulance backed up the alley to get closer to the crash, it hit the woman, who was pronounced dead at the scene. Her identity has not yet been released.

Officials had no idea the driver. They had to express the depth of our sadness for those who lost a loved one today. They had to search the anguish of the paramedic crew whose jobs were torn on a fatal run. We will investigate the circumstances of this tragic accident, and as the work in grief, our thoughts and prayers are with the family of the victim as they go through the difficult loss," said St. Paul Mayor Chris Coleman in a statement.

August 2009 – Impaired...

EMS RESPONDER

Home | News | Training | Multimedia | Request Guide | Forums | Helpdesk | Events

Posted Thursday, August 13, 2009 10:00 AM
 Updated August 13, 2009 10:00 AM (UTC-04:00)

Kentucky EMT Indicted on Murder Charges after Crash

By Andy Black/EMT
 Story by JBL/EMT

LOUISVILLE, Ky. --

A Louisville EMT who was driving an ambulance involved in a fatal crash has been indicted on seven criminal charges, including murder and operating a motor vehicle under the influence of intoxicants.

Tammy Brewer, 36, was behind the wheel when that crash took place in April 2008. The patient inside the ambulance, Valerie Whiteley, 54, died of her injuries from the crash.

Only Whiteley was there April 30 when Brewer appeared in court to face a no proof of negligence charge after she was involved in an unrelated non-injury accident in her own vehicle.

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

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

Date submitted: Tuesday, January 21, 2014 12:07

19542847 | [Read the Article](#) | [What This Article is About](#) | LexisNexis®

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

By Elizabeth Trane
The York Dispatch (York, Pa.)
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An Adams County ambulance carrying a patient to York Hospital, rolled with a car at the intersection of Routes 20 and 61 in West Manchester Township at 7:47 a.m. Monday, and the public it was pronounced dead at the scene.

York County's Public Access Crew (PAC) took the patient, a woman, who being transported from Gettysburg Hospital, Adams Co. was suffering a "significant" heart condition.

The crash will still have to determine whether the road is a particular and if not prior to the crash, or whether the car had a fatal fault or back because of or after the crash. The day said the vehicle is expected to be available for investigation.

- ▶ This IS a Transportation and Automotive Safety issue

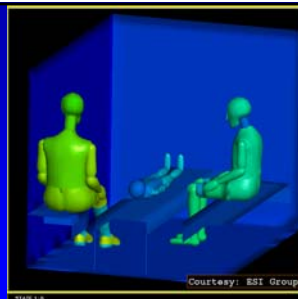
Benefit of Safety

- ▶ 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

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

Testing the real world



Unique workplace

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

The 'workplace' IS a vehicle

- ▶ EMT's often in vulnerable positions during transport.
 - Bench seat
 - Captains chair
 - Standing or kneeling



The 'workplace' is also a crash scene



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:

USA EMS in 1917



1960 to 2009



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

Carl Craigle EMT-P, Chief Platte Valley Ambulance

Carl Craigle EMT-P, Chief Platte Valley Ambulance, CO





Rollover Crash Kills Medical Technician
Indiana State 1971-04-10 and 11th Ave. Injuring Two Employees and a Patient

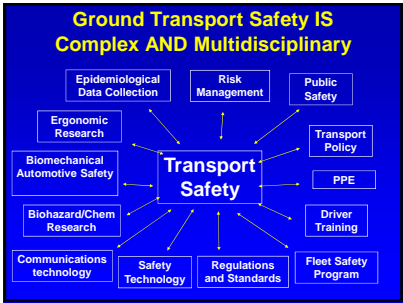
It does happen....

But what about head protection?

New EMS helmet prototypes for 2008-2009

So for EMS personnel...

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



Goals

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

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

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

Intrusion



Deceleration



Dynamic Safety Testing

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

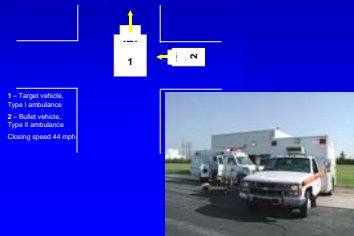
If we know this – and its published....



Why do we do this?



What is actually happening during an ambulance crash





A few key words about restraint systems...



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



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

Increasing awareness ...



What do we know???

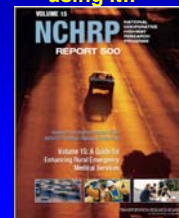
- ▶ Intersection crashes are the most lethal
- ▶ There are documented hazards, some which can be avoided
- ▶ Occupant and equipment restraint with standard belts is effective. (Over the shoulder harnesses for patients should be used, with the gurney in the upright position where medically feasible)
- ▶ 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??

Innovation

Air EMS is a role model for safety initiatives and focus



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



Safety concepts out there now

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

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. Levis, 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 Levis
Objective Safety LLC
United States of America
Larry Wyruch
Michael E. Nagel
California Ambulance
United States of America
Paper Number 050224

Purpose of 'Feedback box' Program

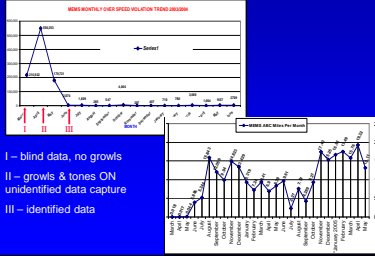
- ▶ Enhance Safety
- ▶ Improve Driver Performance
- ▶ Save Maintenance Dollars
- ▶ Aid Accident / Incident Investigation

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



Extensive Indirect cost savings

- ▶ Fewer out of service vehicles
- ▶ Improved transport times
- ▶ Decreased administrative lost in managing unsafe behaviors
- ▶ Decreased legal burden
- ▶ Automatic system wide data
- ▶ Insurance benefits

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??

Visibility and lighting issues



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???



News we don't want to see

Jan 22, 2007 6:29 am US/Eastern

Caught On Video: EMT Struck By Car

Tom Young Reporting

(CBS) (AP)X 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 15-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 stolen 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 stolen vehicle."

Worker visibility Act: November 24th 2008

PART 624—WORKER VISIBILITY

624.1 Purpose.

624.2 Definitions.

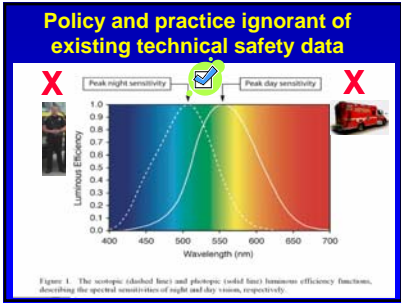
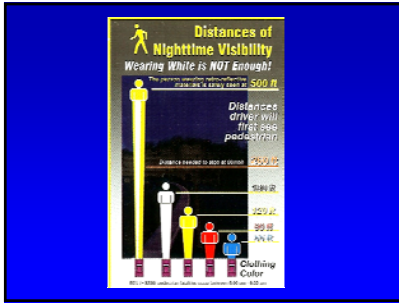
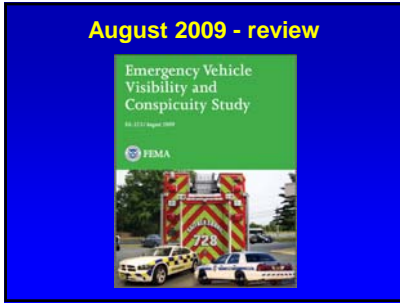
624.3 Construction Act.

624.4 Authority (23 U.S.C. 109(a), 109(b), 110(a), 111, and 602(a); 49 U.S.C. 1101-105, 20171, 20172, and 20173).

624.5 Rule.

All workers within the right-of-way of a Federal-aid highway who are engaged either in public (vehicular safety) or private (non-vehicular safety) work shall wear high-visibility safety apparel.

Workers means people on foot or on riding place from within the right-of-way of a Federal-aid highway, on a highway construction and maintenance project, survey crews, utility crews, roadwork, and other within the right-of-way.



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

"The multicolored (patterned) ambulance while distinctive, may suffer decreased conspicuity because of the effects of camouflage" De Lorenzo & Eilers Annals EM 1991

Color-blindness affects 10% of the population

▶ As seen with normal vision

▶ As seen with color blind vision

Emergency Vehicles – Viewer Awareness

For a timely, appropriate and safe response

- ▶ Location
- ▶ Size
- ▶ Shape
- ▶ Speed
- ▶ Intended path

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

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.

EMS Safety Foundation Delegation bringing Rettmobil to you



Vehicle Occupant Safety design

European design
Safety technology
is a key focus

Safe and Ergonomic design



Ergonomic layout and equipment

Flexibility to manage two patients

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

IRHA selected to test new ambulance
New design smaller, more cost efficient, say health officials

ambulance health is looking to act on its original plan to implementing a pilot project, giving the firm a year to put the sprinter design to see if it could be a replacement to the current fleet of ambulances.

According to Christensen, the Sprinter design looks similar to delivery vans, and boasts a whole new set of safety and technology features such as GPS.

It's a lot smaller, so that makes it a lot easier for paramedics to be strapped in but still be able to reach all the equipment needed to tend to a patient," said Christensen.

Christensen also explained that the new ambulances require less maintenance, and have an overall smoother, quieter ride. They also are lower to the ground and come equipped with new "no-lift" stretchers, that eliminate 85 per cent of strenuous lifting paramedics do to get patients in and out of the vehicle.

Safety first - Passive Safety

Fold-in ridges on subframe

Front axle module

Front axle module after crash

- A main feature in a front-end crash is the "disconnectable" front axle, which releases additional deformation zones in the longitudinal frame member when a particular force level is reached.
- On a frontal crash, transmission and engine will be pushed underneath front occupants.

Is safety crash tested by automotive experts



Unlike this vehicle



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???



Fleet Mix ?



“Ripoff and Duplicate”

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

Tips for Emergency Vehicle Operations

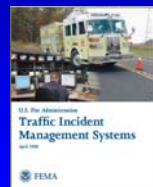


USFA Emergency Vehicle Safety Initiative



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 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"

What do we know works...

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

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>

