To quote Steve “Sid” Caesar – Director IHS ES
“We want everyone to get home safely each day”

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…….

A BIG Problem

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

Science behind Policy

▶ “For successful technology, reality must take precedence over public relations, for Nature cannot be fooled.”

Richard P. Feynman 1988

EMS Transport Safety

▶ ‘patient safety’ AND also
▶ ‘provider’ and ‘public safety’
Safety concepts out there now
- Fleet Safety Management
- Z-15
- Driver monitoring and feedback
- Enhanced ambulance vehicle design
- Intelligent Transport Technologies - ITS
- Visibility and Conspicuity
- New Safety Standards
- Independent resources and information

http://www.objectivesafety.net

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

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

Thursday July 5th 2007 ......

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

Five Killed in Crash of Ambulance and Semi
July 21, 2007 09:20 AM EDT

Our Lady of Lourdes Medical Center, Newburgh, NY - The driver of an ambulance that collided with a tractor-trailer at an intersection, killing five people including the driver and four other passengers, was cited for running a red light, state police said Monday. The collision occurred at 5:30 p.m. on Sunday at the intersection of North Street and Schuyler Road in Newburgh. The ambulance was en route to an emergency, state police said. The tractor-trailer, driven by a man from New York City, was traveling north on North Street and hit the ambulance, driven by a man from Middletown, police said. The ambulance was traveling east on Schuyler Road, police said. The driver of the ambulance was pronounced dead at the scene, state police said. Four other passengers, all women, were taken to hospitals in New York City, police said. Two of the women were in critical condition, state police said. The other two were in serious condition, police said. The driver of the tractor-trailer was also taken to a hospital in New York City, police said. He had not been charged as of Monday, state police said. The driver of the ambulance was not charged as of Monday, state police said. The intersection of North Street and Schuyler Road is a four-way stop, state police said. The driver of the ambulance was cited for running a red light, state police said. The tractor-trailer driver was released from the scene, state police said. The ambulance driver was not wearing a seat belt, state police said. The tractor-trailer driver was wearing a seat belt, state police said. The ambulance was carrying a patient from a hospital in New York City, state police said. The patient was being transported to another hospital in New York City, state police said. The patient was not injured, state police said. The patient was taken to a hospital in New York City, state police said. The patient was not injured, state police said. The patient was taken to a hospital in New York City, state police said.

April 20, 2008...
An interhospital transport? “Do no harm….”?

Two counts of vehicular homicide… November 5, 2007 - PA

Firstly!

An accident? or a predictable and preventable event

In a nutshell

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

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 garment 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??

Transport oversight?

- In contrast to the bus and truck industries, which have -
  - comprehensive safety oversight
  - transportation safety interventions
  - transportation safety data capture via the Federal Motor Carrier Safety Administration (FMCSA)
- EMS has been focused more as an acute health care delivery and emergency medical service and largely outside of much of the other transportation oversight infrastructure that exists

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

Fatalities and funerals

New Information 2007-2008

- Enhanced Safety of Vehicles (ESV), June 2007
- K-04-F August 2007
- 08-1931, Federal Register
- SAFETY4U, 2006 (Safe, Accountable, Federal, Efficient Transportation System Act) Federal Register
- Enhanced Safety of Vehicles (ESV), June 2007 - 2008
- American Society Safety Engineers (ASSE), June 2007 - 2008
- EMS Safety Oversight, June 2008
- NAEMSP Jan 2008
- Transportation Research Board – EMS Safety Subcommittee, Jan 2008
- EC2 2008
- SAE - New York, New England, April 2008
- ICEMS May 2008
- International Ergonomists Association (IEA), June 2008
- EMS Policy/Best Practice
- SAEC - October 2008
- Overdose death prevention - 2008
- Worker visibility Act, to be implemented, Nov 2008
Can no longer say – “I didn’t know…..”

**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

**New paradigm - Integration of EMS**
- Public health departments
- Social service agencies
- Community outreach
- Hospitals
- Health care networks / Insurers
- Industry

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

**1960 to 2007**
- A passenger vehicle - sure
- "Laundry or mail truck" - ?
- A passenger vehicle - sure

**Some recent adverse outcomes**

**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

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

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

The EMS transport process

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

The Emergency Department (ED)

An ambulance is not an ED /ICU on wheels

National EMS data

In the USA*

- ~ 50,000 vehicles
- ~ 5,000 crashes a year
- One fatality each week
- ~10 fatalities on 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

Is it your service’s tragic year?

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

Predictable risks

- Fatal crashes more often at intersections, & with another vehicle (p < 0.017)*
- 79% of fatal crashes EMS crashes during Emergency Use**
- Most serious & fatal injuries occurred in rear (OR 2.7 vs front) & to improperly restrained occupants (OR 2.5 vs restrained)**
- 82% of fatally injured EMS rear occupants unrestrained**
- 82% of fatally injured EMS rear occupants unrestrained**
- > 74% of EMT occupational fatalities are MVC related***
- Serious head injury in >65% of fatal occupant injuries#
- More likely to crash at an intersection with traffic lights (37% vs 18% p=0.001) & more people & injuries/crash than similar sized vehicles##

*Kahn CA, Pirrallo RG, Kuhn EM, Prehosp Emerg Care 2001 Jul-Sep;5(3):261-9
**Becker, Zaloshnja, Levick, Li, Miller, Acc Anal Prev 2003
#NIOSH, 2003
##Ray AM, Kupas DF, Prehosp Emerg Care 2005 Dec; 9:412-415

USA crash fatality rate/capita 35x higher than in Australia

In the USA*

- ~ 50,000 vehicles
- ~ 5,000 crashes a year
- One fatality each week
- ~10 fatalities on 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

Is it your service’s tragic year?

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

Predictable risks

- Fatal crashes more often at intersections, & with another vehicle (p < 0.017)*
- 79% of fatal crashes EMS crashes during Emergency Use**
- Most serious & fatal injuries occurred in rear (OR 2.7 vs front) & to improperly restrained occupants (OR 2.5 vs restrained)**
- 82% of fatally injured EMS rear occupants unrestrained**
- 82% of fatally injured EMS rear occupants unrestrained**
- > 74% of EMT occupational fatalities are MVC related***
- Serious head injury in >65% of fatal occupant injuries#
- More likely to crash at an intersection with traffic lights (37% vs 18% p=0.001) & more people & injuries/crash than similar sized vehicles##

*Kahn CA, Pirrallo RG, Kuhn EM, Prehosp Emerg Care 2001 Jul-Sep;5(3):261-9
**Becker, Zaloshnja, Levick, Li, Miller, Acc Anal Prev 2003
#NIOSH, 2003
##Ray AM, Kupas DF, Prehosp Emerg Care 2005 Dec; 9:412-415
Occupational transportation fatalities.

'Workplace' Hazards

What do ambulance crashes really cost?

June 2007

Nascar Safety Expert

A problem

2007 Insurance data –

and what is killing EMS?

EMS personnel fatalities*

What do ambulance crashes really cost?

>> Loss of life and injury

>> Negative impact on EMS system

>> Collisions are the largest liability cost and exceeds malpractice or negligence

>> Besides the direct financial costs of replacing a damaged ambulance and equipment, there are additional hidden costs incurred:

>> Investigating the ambulance collision

>> Litigation, settlement, lawsuit

>> Medical/disability costs of injured EMTs

>> Hiring of new employees to replace injured personnel

>> Retraining and psychological counseling of personnel involved and others

>> Increased insurance rates


June 2007

A problem

2007 Insurance data –

>> 27 times more likely to have a claim based on transport than related to medical care

>> “Ambulance transport has a death toll.....”

Carl Craigle EMT-P, Chief Platte Valley Ambulance

Colorado Springs, April 2007

Nascar Safety Expert

>> On ambulance patient compartment

>> “It is a death vault”

Tom Glissoen,
Head of Safety, GM NASCAR
“Policy makes a difference…

Are our policies killing people?”

- 1991-2000, 302,969 Emergency vehicles were involved in MVCs - 1,565 involving fatalities*
- In PA 1997-2001, ambulances were more likely than similar sized vehicles to be involved in:
  - 4 way intersection crashes (43% vs 23%, p=0.001)
  - Collisions at traffic signals (37% vs 18%, p=0.001)
  - MVCs with more people injured (76% vs 61%, p=0.001)

*Comparison of Crashes Involving Ambulances with those of similar sized vehicles – Adam Ray, Douglas Kupas, PEC Dec 2005;9:412-415

Vehicle Operations Position Statement

WEMSA – October 2007

1. Emergency Vehicle Operations Policy
2. Vehicle operations training and evaluation
3. A program of graduated driver responsibility
4. Drivers only age 25 and over
5. Complete stop at an intersection
6. Restricted use of Red Lights and Sirens
7. Monitoring of emergency vehicle operations

WEMSA covered some key and important policies and procedures But…

- What about hours of service?
- What about visibility at the scene? For providers and the vehicles?
- What about protective equipment?
- What about ambulance design safety?
- What about reporting of adverse events?

Integration and Collaboration


State Strategic Highway Safety Plans

- Required as part of the SAFETEA-LU legislation
- Engineering
- Education
- Enforcement
- Emergency Medical Services
- EMS is a core theme

State SHSP EMS Focus*

- EMS is a core theme

Pennsylvania Code

[Insert text relating to Pennsylvania Code]
Patients must be in the over the shoulder harness, medics restrained in seat belts, equipment secured.

Use proven safety tools:

Safety saves time, lives AND money:

Canada, Nova Scotia

- Since 2000 working towards a goal of zero loss ratio with insurance provider
- 10 million kilometers per year
- 150 emergency response ambulance units
- Collision claim history measured in dollars per 100,000 kilometers traveled:
  - 2000/2001 $1725.00
  - 2001/2002 $1049.00
  - 2002/2003 $751.00
  - 2003/2004 $416.00
  - 2004/2005 $229.00

Very Scary insurance data:

<table>
<thead>
<tr>
<th>Year</th>
<th>Payroll</th>
<th>Modified Premium</th>
<th>Incurred Indemnity</th>
<th>Incurred Medical</th>
<th>Total Claims</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>14.1</td>
<td>440</td>
<td>885</td>
<td>9,925</td>
<td>93</td>
</tr>
<tr>
<td>2002</td>
<td>12.6</td>
<td>447</td>
<td>266</td>
<td>255</td>
<td>78</td>
</tr>
<tr>
<td>2001</td>
<td>11.3</td>
<td>454</td>
<td>88</td>
<td>128</td>
<td>55</td>
</tr>
<tr>
<td>2000</td>
<td>10.6</td>
<td>420</td>
<td>63</td>
<td>194</td>
<td>89</td>
</tr>
<tr>
<td>1999</td>
<td>10.1</td>
<td>405</td>
<td>115</td>
<td>117</td>
<td>56</td>
</tr>
<tr>
<td>1998</td>
<td>9.6</td>
<td>411</td>
<td>11</td>
<td>30</td>
<td>51</td>
</tr>
</tbody>
</table>

Workers Compensation Rate increased by 26.5 %
Was $5.86/$100 payroll in 2005-2006
Now it is $7.41 for 2006-2007

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

Engineering

Ergonomic

Epidemiology

Non issue

Safe

Safer

Priorities...... Research papers in the past 30 years

- EMS Safety
  - 40 papers - on ambulance safety
  - 2 papers - on ambulance ergonomics
  - 1 paper – on stretcher ergonomics

- Computer Workstations
  - 30,000 papers – on ergonomics of computer work stations

- Erectile Dysfunction
  - 100,000 papers – on Erectile Dysfunction

EMS Ergonomics 2005, 2006

December 2007 Prof Issachar Gilad

Range of reach

Safety for emergency transport

Policy that reflects SCIENCE

Ambulance Manufacturer Division (AMD) Standards

Public Comment, July 2007

Engineering Analysis, Jan 2007

ICEM 2008
Increasing awareness ...

Risk/Hazards
- Predictable risks
- Predictable fatal injuries
- Serious occupational hazard
- Public safety hazards

EMS Best Practice, Sept 2006
Transportation Research Board is an excellent resource... we should be using it!!

But what about head protection?

New EMS helmet prototypes for 2008

It does happen...
What are the solutions?
- Training?
- Practice Policy?
- Transportation Systems Engineering?
- Automotive Engineering?
- Education of other road users?

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

Driver issues
- Enhanced driver selection
- Enhanced driver monitoring and feedback
- Enhanced driver performance
- Enhanced driver training

What about changing driver behavior in the real world?

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

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
- Auditory feedback of warning ‘growls’, and penalty tones
- Data downloaded automatically every day

Demonstrated Effectiveness

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 youtube??

The jury is out on
- Opticon
- Simulators

And very Predictable...
- Intersections are lethal environments

So... The real world for an EMS vehicle approaching a red light
- You think they heard you...
- You know they must have seen you...
- And maybe they did
- ...But...
- There is NO way humanly possible that they could stop.....

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

Dynamic vs. Static Safety Testing

Dynamic Safety Testing
- Requires sophisticated, expensive equipment
- Measurably demonstrates forces generated during collision
- Accepted international standard for vehicle restraint systems

The Crash Event - Crash Testing
- An introduction
- What one needs to know
- What do the tests really mean
- And, what tests are meaningful
Intrusion vs Deceleration

- Intrusion
  - vehicle to vehicle or vehicle to fixed narrow object
- Deceleration
  - sudden stop – i.e. sled test

If we know this – and it’s published…


Why do we do this?

Test 1 – Right side impact

Johns Hopkins University
- Target vehicle, Type I ambulance
- Bullet vehicle, Type II ambulance

Closing speed 44 mph

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

‘Safety’ approaches being driven by manufacturers claims and sales rather than by science and data?
USA Ambulances: FMVSS Exempt

Propaganda that kills…

Occupant protection……??

USA ambulance purchase specifications

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

AMD 2007 – ‘safety testing’

- Ignorant of 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.

Unacceptable, and ridiculous current 2007 USA ambulance ‘safety testing’ practices !!!?

No ‘a’… then NO ‘F’ !!!!!

\[ F = ma \]

where
\[ F \text{ – force} \]
\[ m \text{ – mass} \]
\[ a \text{ – acceleration} \]
It's not magic... what is safe is known and understood.

NOT new technical data...

The Ride of Your Life....

NIOSH Ambulance Occupant Safety Crash Testing

Impact Direction 25 MPH!

Being seated IN an automotive seat is what will protect you

- Anything that allows or encourages you to get up out of your seat will also encourage you to be injured or killed – it is potentially lethal to be out of your seat in any fashion
- 4 or 5 point harnesses for side-facing 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

NO automotive safety engineer
NO crashworthiness engineer
NO ergonomist
NO reference to ANY existing or relevant automotive safety or crashworthiness technical publications.... yet multiple occupant fatalities and injuries annually....

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

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

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

Ambulance Transportation Safety Task Force January 25th 2008

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 event for EMS innovation Fulda, Germany
http://www.rettmobil.com/
Australia, Melbourne

Norway initiatives

Sweden initiatives

Other successful models

NSW Australian vehicles

Flexibility to manage two patients

High speed crash, rolled and the occupants (patient and medics) had only minor scratches
Science not, next best guess

Recent Visibility Webinar
www.GlobalEMSForum.org

Policy and practice ignorant of existing technical safety data

Day visibility
Night visibility
Visibility and Conspicuity ...

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

This looks cool AND SAFE!

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.

Not rocket science...

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

March 2007 - FHWA
**Tips for Emergency Vehicle Operations**
- No left turns – instead make three rights
- Don’t back up
- Don’t employ any drivers under 25 years of age
- Don’t employ anyone with a history of driving convictions

**USFA Emergency Vehicle Safety Initiative**
- UPS: The ‘Big Brown’
- Coming Soon!
  - Traffic Incident Management Systems (TIMS)
    - USFA report to be released any day
    - Research and writing by IFSTA
    - Covers setting up safe roadway incident work areas and using unified command at these incidents
    - Will be available in a downloadable format

**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??

**Risk/Hazards**
- Predictable risks
- Serious occupational hazard
- Public safety hazards

**Creating a Safety Culture**
- Awareness
- Training
- Incentive
Some simple and available solutions out there now

- Intersection Policy
- PPE
- ‘Feedback’ boxes

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 (e.g. 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

Be ready for...

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

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 designs, 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