

## EMS Safety Foundation,

at a PC/Laptop near you, November 12, 2009  
Innovation, Collaboration and Knowledge Transfer and Policy

### Key Lessons from the Workshop and the Summit, and EMS Safety Foundation Developments for 2009-2010



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

## Background:

- ▶ EMS Safety Foundation has been established to fill a gap in
  - technical knowledge transfer
  - practical interdisciplinary R & D
  - evaluation and implementation of system safety enhancements for EMS and Medical Transport
- ▶ It is a not-for-profit institute

## Mission

- ▶ This is a team of like minded innovators across EMS Medical Transport and a number of technical disciplines, who share the common mission of enhancing the safety of EMS delivery for all involved.

## In a nutshell

- ▶ EMS Safety Foundation is a not-for-profit multidisciplinary virtual think – tank and test bed for safety innovation and knowledge transfer
- ▶ It is a virtual network integrating the end users and the technical experts
- ▶ A tool to enhance the safety of delivery of EMS services

## So what is a Webinar?

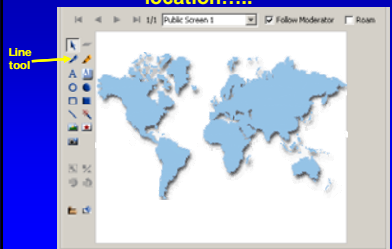
A Webinar is:

- ▶ Real time interactive web technology
- ▶ No other hardware is necessary aside from a computer connected to the internet and a microphone- if you choose to speak
- ▶ These interactive seminars can also be stored for later asynchronous use

## Webinar Basics



..use white board tools to mark your location.....



## Today's Webinar is recorded!

The presentation and all comments typed in the text box



will be available for viewing via the [www.EMSSafetyFoundation.org](http://www.EMSSafetyFoundation.org) web site within 72 hours

## The EMS Safety Foundation

[www.EMSSafetyFoundation.org](http://www.EMSSafetyFoundation.org) brings this presentation to you



## R & D "Ripoff and Duplicate"

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

## Today's Webinar

- ▶ Will cover -
  - ♦ 2009 Webinar retrospective
  - ♦ October Workshop summary
  - ♦ October TRB Summit overview
  - ♦ Global EMS Forum 'Safety in the Back'
  - ♦ Update on NFPA, SAE and ISO standards
  - ♦ New EMS Safety Foundation 2010 developments

## October 22, 2009, TN Patient and Provider killed, Attendant Critical



**Wednesday, 2009 truck collides with 4-42 ambulance**

An accident on Interstate 85 this afternoon killed an elderly patient and a paramedic, and left another patient in critical condition.

At about 2 p.m., a RuralMetro ambulance transporting an elderly Tennessee Department of Health emergency care patient, according to Metro police information, was involved in a crash with a truck on Interstate 85. The ambulance driver, David Chen, a firefighter at Vanderbilt Medical Center, where he died.

The elderly patient died at the scene, her name has not been released.

Healthcare firefighter and RuralMetro employee Ernie Johnson, 51, was in the rear of the ambulance assisting the patient when the crash occurred. He was transported to Vanderbilt Medical Center where he is in critical condition.

TODD vehicle driver Robert Green, 46, of Columbia was transported to Vanderbilt Medical Center where he is in stable condition, Metro said.

As of 5:45 p.m., traffic on the northbound lanes of I-85 was moving, but southbound traffic was moving slowly, Metro said. There was also significant delay on I-75.

## A tragic week.... It does happen

October 22, 2009

Email Print Comment Register Bookmark RSS What's This

### NC paramedic killed in ambulance crash

**WTOG**

FORT BRAGG, N.C. — Military officials confirmed a paramedic was killed Thursday morning heading to an injury call.

A spokesman at Fort Bragg said an ambulance was on the way to parachute training jump at Camp McCall in Hoke County when the driver lost control, spun around and landed in trees along Frank Road near Turkey Road.

The driver of the ambulance was critically injured. She was taken to Womack Army Medical Center. A second medic in the vehicle was killed.

The investigation into what happened continues, and the name of the dead paramedic has not been released.

## This week

### Ambulance en route to GF hospital collides with car - North Dakota

With lights flashing and sirens sounding, a Red Lake Falls, Minn., ambulance with a patient on board collided with a car in a busy East Grand Forks intersection Monday afternoon.

Police Officer Dave Thompson said the ambulance was heading west on U.S. Highway 2 shortly before 1 p.m. when it hit the driver's door of a 1998 Buick Park Avenue going south on state Highway 220.

Thompson said two ambulances responded to the crash and each brought a patient to Altru Hospital in Grand Forks: One transported the Buick's driver, an 88-year-old East Grand Forks man; the other took the patient who was inside the ambulance that crashed.

That patient was headed for Altru before the collision to be treated for a substantial cut that left tendons showing on his right index finger, Thompson said. The patient had come from Red Lake Falls, a town about 40 miles east of Grand Forks.

Altru did not release the conditions of the men transported. Police did not make public the name of anyone involved in the crash, citing a pending investigation. Thompson said a prosecutor would review the department's investigation to determine if criminal charges are warranted.

## EMS Safety Foundation 2009 in Review

- ♦ January Webinar - *Transferring Technical Knowledge to Operations Practice, New Developments, and 2009 Program*
- ♦ March Webinar - *Pediatric and Neonatal Transport Safety, International Approaches to Ambulance Design Specifications and Rettmobil Plans*
- ♦ May Webinar and Workshop - *'Live from Rettmobil'*
- ♦ June Webinar - *Part 1: Rettmobil 2009 Perspectives and Applications*
- ♦ July Webinar - *Part 2: Rettmobil 2009 Perspectives and Applications Follow up and Standards Update*
- ♦ September Webinar - *Concepts to Practice: Fleet Safety Economics, You and Detroit, Regulations and Guidelines, the Workshop and Summit*
- ♦ October Workshop - *'Design and Operational Aspects of Patient Transport Safety: Vehicles and Stretchers'*
- ♦ November Webinar - *Key Lessons from the Workshop and the Summit, and EMS Safety Foundation Developments for 2009-2010*

## EMS Safety Foundation Ambulance Vehicle & Ergonomics Workshop, October 2009



## October 28<sup>th</sup> Workshop Agenda

- 13:00 - 13:05 Workshop Introduction: Nadine Levick MD, MPH
- 13:05 - 15:00 Session A: Vehicles
- Gene Lukonov - Vehicle and occupant systems safety
  - Jeff Welch - Occupant protection strategies
  - Walter Bloch - Vehicle operational and design safety
  - John Killen - Vehicle Visibility and Conspicuity
- 15:00 - 15:30 Afternoon Tea Break
- 15:30 - 15:45 Session B: An International Approach
- Perspective from Norway
- 15:45 - 17:30 Session C: Stretchers
- Chris Fitzgerald
    - Overview of stretcher features
    - Design influence and impact on stretcher (operational) tasks

## Workshop Outline

- Ambulance vehicle occupant protection
- Ergonomics as it applies to EMS
- What are the principles
- How do the different challenges of ergonomics and automotive safety systems integrate
- What technologies are there to assist in getting the best outcome

**Automotive engineers addressing EMS Safety Foundation Workshop**



**VEHICLE DESIGN and SAFETY**

Extensive Passenger Car and Light Truck Vehicle Safety Standards apply to vehicles below 10,000 Gross Vehicle Weight (GVW)

VEHICLES over 10,000 GVW have a reduced set of Federal Safety Standards

VEHICLE SELECTION IS CRITICAL

**VEHICLE DESIGN and SAFETY**

ACTIVE Vehicle SAFETY

PASSIVE Vehicle SAFETY

**VEHICLE DESIGN and SAFETY**

ACTIVE Vehicle SAFETY

- ESC (Electronic Stability Control)
- ABS (Anti Skid Braking System)
- Advanced Safety Systems

**VEHICLE DESIGN and SAFETY**

- ESC: ELECTRONIC STABILITY CONTROL



- Electronic stability control systems are second only to seat belts in terms of the potential for saving lives and reducing injuries... is a major step forward for global auto safety.

Statement by Nicole Nason, Administrator, National Highway Traffic Safety Administration, On the Adoption of Electronic Stability Control as a Global Technical Regulation

**VEHICLE DESIGN and SAFETY**

- ESC ELECTRONIC STABILITY CONTROL



**VEHICLE DESIGN and SAFETY Mitigating Consequences**

PASSIVE SAFETY: Crashworthiness

- Vehicle Structural Design
- Front and Rear Compartment Design
- Seating and Restrain Systems
- Occupant Containment
- Impact Friendly Surfaces

**AMBULANCE ACCIDENT REDUCTION OPPORTUNITIES**

- AVOID ACCIDENTS
  - Driver Training and Responsibility
  - Operating Rules
  - Improved Ambulance Conspicuity
- Choose Vehicles with Advanced Safety Technology
- Engineer Rear Compartment Interior to be IMPACT FRIENDLY
- Constrain Attendants SAFELY
- Constrain Patients SAFELY
- SECURE all Equipment reliably

**Seat Structure and Seat Belts**

- Seat structure can be used to maintain occupant position as well as contribute to intrusion resistance in side impacts
- Seat belts are known to be effective in passenger vehicle rollover ejection mitigation as well as preventing excessive interior impacts
- For large compartments, these features can be used to improve occupant protection and have fewer concerns than active airbag systems

## Seat Structure

From U.S. Patent 7,328,938

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## Sprinter Features Summary

**Market Exclusives**

- Available left side sliding door
- Premium CDI turbo Diesel engine with SCR technology to meet the EPA / CARB 2010 emission standards.
- Best in class cargo capacity
- Best in class wall-to-wall turning diameter
- Best in class available payload capability
- Superior safety standard with ABS, ASR, BAS, ESP and 3-point seat belts on all passenger seats
- Most versatile commercial van on the market

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## Load adaptive Electronic Stability Program (ESP)

**Details and Technology (cont.)**

- **ROM** (Roll Over Mitigation) – This system helps to detect rollover tendencies during maneuvers with low road speed and high lateral acceleration.
- **RMI** (Roll Movement Intervention) – This system helps to detect rollover tendencies in dynamic maneuvers and in high-speed evasive maneuvers with a high lateral acceleration.
- **LAC** (Load Adaptive Control) – is an adaptive algorithm which calculates the vehicle mass and center of gravity using various parameters such as acceleration, speed and the accelerator position.
- **EUC** (Enhanced Understeering Control) – provides enhanced stability under heavy under steer, for example when driving quickly through tight-radius corners.

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## Safety First – Passive Safety

**Fold-in ridges on subframe**

**Front axle module**

- 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.

**Front axle module after crash**

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## Parametric Special Module

- PSM is a "Gateway" for vehicle information
- Control of vehicle functions
- Engine-Functions
  - Fixed rpm specification
  - Variable rpm control
- Logical Functions (AND, NAND, OR, NOR, XOR etc.)
- Counter blocks, flip-flops, timer stages etc.
- Defined interface, easy access, short set-up times

**Remarks:**

- PSM preparation is standard on Sprinter MY2008 and later

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## MY 2010 Emissions Features

- **DEF tank location on Sprinter Cargo & Bus**
  - Tank location under the floor RH side behind B-pillar
  - Tank volume 6.6gal. = 25L
  - Tank features drain plug

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## Sprinter Customer Assurance Program

Western Emergency Vehicles (WV)	500 Columbia Blvd Alhambra, CA 91803	951.274.9000	Family Service	2008
Leader Industries	12811 Truman Ave Hemellock, CA 94528	925.474.0000	Dayly Rotor	2008
North Specialty Vehicles	2008 Wilson St. Edison, NJ 08812	973.236.9177	Tom Killeen	2008

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## EMS Safety Foundation Workshop

**After the FEMA study – where to now?**

**Effective vehicle markings;  
3 case studies**

John Killeen

**Ambulance VISIBILITY**

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## Muskoka EMS Canada

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### Muskoka EMS Canada

- Heavy snow environment in winter
- Muskoka wanted to include corporate logo colors, but also increase visibility
- Orange diagonal design was confusing and provided little conspicuity
- The lower reflective strength of sweeping green & blue do not detract from dominant yellow/green

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### Muskoka EMS Canada

- Waistline height reflectivity
- Muskoka chose solid yellow for rear
- Blue lettering is key-lined to increase reflectivity
- Different brands of material used to achieve the result
- Consultation was entirely virtual over the internet with a successful result

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### Improving the vehicle profile with fluorescent colour and contour markings

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**Statens vegvesen**

### Perspective from Norway

**Ronald Rolfsen**  
 Advisor  
 Oslo university hospital - Pre-hospital division / Ambulance department

**Geir Vidhammer Engely**  
 Asst. Section leader/Paramedic  
 Oslo university hospital - Pre-hospital division / Ambulance department

Norwegian Public Roads Administration Motor Vehicle and Driving License Inspectorate:  
**Liv Bråmark**  
 Coordinator, Ambulance group  
**Stein Erichsrud**  
 Senior Engineer

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### Principles when purchasing ambulances

- Must fulfill all laws and regulations
- EN 1789 standard as a minimum
- Special requirements from our service:
  - Better internal lights (White halogen)
  - Reduced noise level (65dB A at 60 km/h and 70dB A at 120 km/h)
  - Focus on securing people and equipment
  - Focus on hygiene / easy to keep clean
- The attendant should reach all basic equipment, communication, light and climate controls without releasing the safety belt

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### Basic layout MB Sprinter ambulance

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### Basic layout Volvo V70 AWD ambulance

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### Basic layout Volvo V70 AWD ambulance

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**Statens vegvesen**

*"Together for your safety"*

### Ambulance Investigation - Norway

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Statens vegvesen "Together for your safety"

### National analysis group

- National Health Authority  
Licensing health professionals
- National Vehicle & Roads Administration  
Approval and technical control of ambulances
- Paramedics from Oslo university hospital

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### Ambulance investigation

- Accidents involving an ambulance with injury or death
- Accidents involving an ambulance with major damage to property
- Accidents where equipment inside the ambulance cause injury / danger of injury

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### Summary

- Safety of the patient and the crew are an important issue
- The use of shoulder straps on a stretcher are mandatory (unless a medical reason)
- The national analysis group can implement reactions against employees and suppliers.
- Can we be better? Absolutely!

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Ergonomist Chris Fitzgerald addressing the Workshop



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EMS Safety Foundation  
Ambulance Transport Innovation Workshop

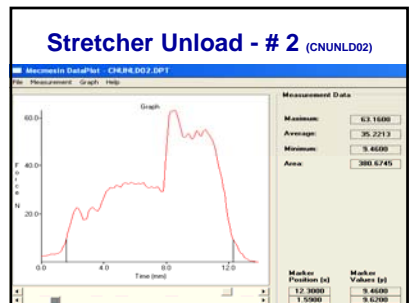
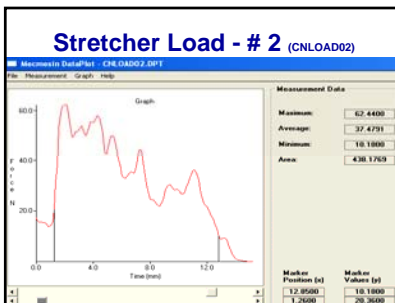
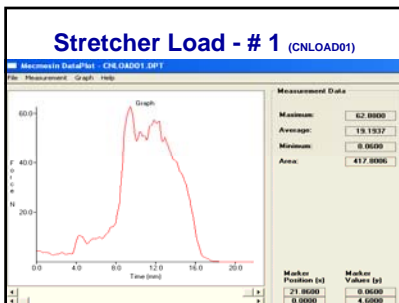
Design and operational aspects of X Frame Stretchers

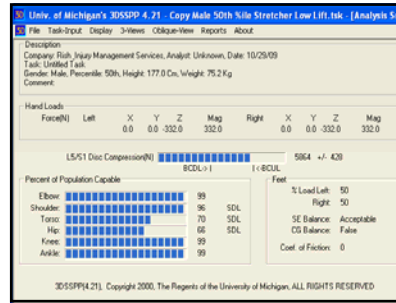
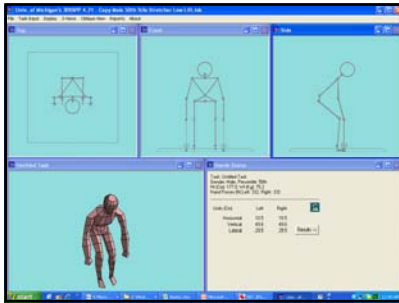
Chris Fitzgerald - Ergonomist

October 28<sup>th</sup>, 2009

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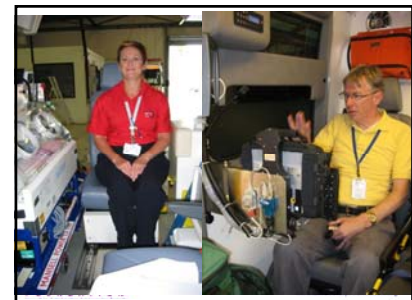


## Solutions

- Reduce levels of force exertion via,
  - Greater recruitment strategies for lifting, lowering, loading & unloading
  - Mechanisation / Design based
    - Use lower ambulance floors
    - Use other stretcher systems such as those with independent front & rear leg system – these collapse as they are loaded

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## National Academies Transportation Research Board's Ambulance Transport Safety Summit October 29, 2009

<http://www.objectivesafety.net/TRBSummit2009.htm>

## TRB Summit Focus

▶ *'Bridging the gap between what we do and what is known - Enhancing ambulance transport safety through shared knowledge of technical data'.*

## Thank you to the EMS Safety Foundation Speakers and Moderators who assisted with the TRB Summit

▶ Matt Crossman	▶ Dan Garstang
▶ Sandy Beers	▶ Gene Lukianov
▶ Charlene Cobb	▶ Chris Fitzgerald
▶ Comilla Sasson	▶ Jeff Welch
▶ Ken Beers	▶ Eileen Frazer
▶ Wayne Zygowicz,	▶ Jon Swanson
▶ Mike Reid	▶ Jim Love
▶ Martha Florey	▶ Kevin Peters
▶ Art Cooper	▶ Dia Gainor

### TRB Summit Downloads

<http://www.objectivesafety.net/TRBSummit2009.htm>

### October 2009, TRB Ambulance Transport Safety Summit Agenda

- **Session 1: Burden/Benefit** - Safety Data, Economics, Ethics and Risk /Benefit
- **Session 2: Transport System Management** - Fleet/Vehicle Operations Safety, Operations Management
- **Session 3: Vehicle Safety - Assessment and design** - Vehicles, Special Populations
- **Session 4: Information Sharing and Policy** - Knowledge Transfer/Dissemination, Standards/Specifications Policy, An international perspective from Oslo, Norway
- **Session 5: Panel and Research Priorities** -



### 2009 TRB Summit

<http://www.objectivesafety.net/TRBSummit2009.htm>

► Brought together a spectrum of diverse expertise and representation :

- **Government agencies**
  - National Highway Traffic Safety Administration (NHTSA)
  - Department of Transportation (DOT)
  - National Transportation Safety Board (NTSB)
  - Federal Highway Administration (FHWA)
  - Federal Motor Carrier Safety Administration (FMCSA)
  - Bureau of Labor and Statistics (BLS)
  - Department of Homeland Security (DHS)
- **Teamsters**
- **EMS State Directors**
- **EMS Services**
  - private and municipal from across North America
  - Fire/Rescue
  - Volunteer EMS
- **EMS Physicians**
- **Industry partners**
  - EMS Equipment
  - Vehicles, both OEM and aftermarket
- **Academics**
- **Technical experts**
  - Automotive safety engineering, occupant protection
  - Ergonomics and human factors



### Session1: Burden & Benefit

- **Introduction and Opening Address – 8.00-8.15am EDT USA**  
Introduction - Rick Fain PhD, Nadine Levick MD, MPH  
Opening address – Mr. Glenn Luedtke (Introduced by Mr. Jeff Lindsay)
- **Session 1: Burden/Benefit - 8.15-10.00am**  
Safety Data – 8.15-8.50  
Economics- 8.50 – 9.40  
Ethics and Risk /Benefit – 9.40 – 10.00

Break 10.00- 10.30am

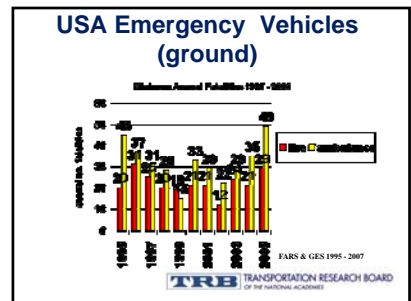
\*Webinar attendees - LOG OUT 10am- LOGIN 10.20am USA EDT\*

### Ambulance Safety The Delaware Experience

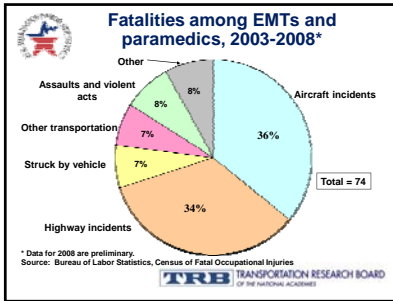
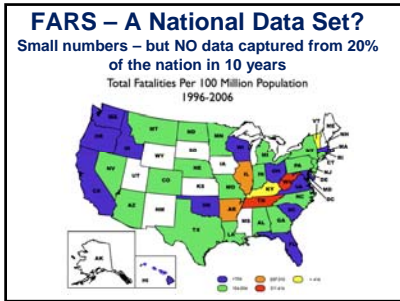
### Ambulance Safety The Delaware Experience

**Glenn H . Luedtke, NREMT/P**  
Director, Sussex County EMS  
Vice-Chair, Delaware EMS Oversight Council  
Chair, NAEMT EMS Safety Course Committee

- Representing:
  - Sussex County EMS
  - Delaware Volunteer Firefighter's Association
  - National Association of EMT's

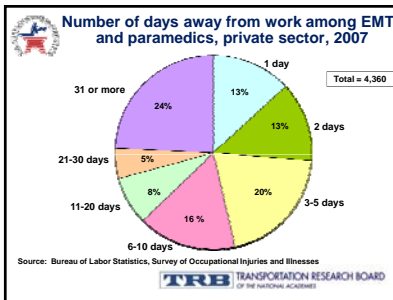
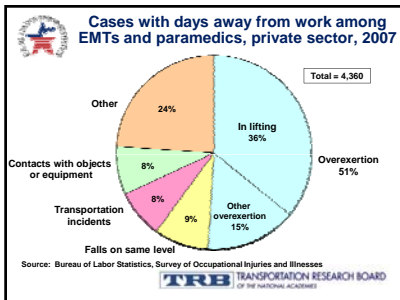






### Survey of Occupational Injuries and Illnesses (SOII)—Nonfatal data

- Data obtained from an establishment survey based on OSHA recordkeeping logs.
- National data prior to 2008:
  - Cover private wage and salary workers only
  - Exclude volunteers unless compensated
- Data for 2008 and beyond:
  - Include paid State and local government workers
- Case and demographic characteristics:
  - Available for cases with days away from work only.



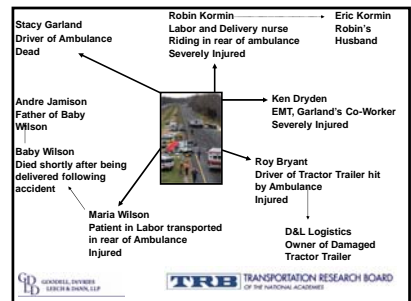
### Upcoming releases: 2008 data

- National data for nonfatal injuries in the public sector:
  - Summary industry data: October 29
  - Case and demographic data (i.e. data for EMTs): Early 2010
- Final fatality data: April 2010

IF SAFETY FOR THE SAKE OF SAFETY WASN'T ENOUGH:

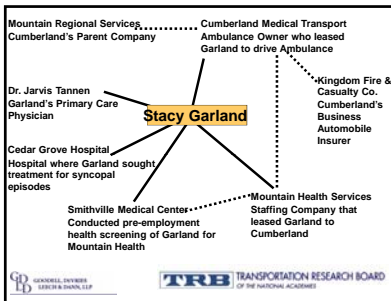
**A WORD ON LAWSUITS AND LIABILITY**

Michele R. Kendus  
Goodell, DeVries, Leach & Dann, LLP



### Causes of Action:

- Bodily Injury
- Wrongful Death
- Loss of Services
- Property Damage
- Workers' Compensation



## Usability – Human Factors

### Chris Fitzgerald (Ergonomist)

EMS Subcommittee of the TRB Ambulance Transport Safety Summit

October 29<sup>th</sup>, 2009

### Outline

#### Presentation overview

- Framework to consider human factors.
- Defining your population of users.
- Designing for operational paramedic tasks.
- Understanding how paramedics access, use & restow equipment.
- Balancing item accessibility with prevention of strike hazards.
- Design challenges.

### Ambulance Fleet Economics

- Fleet Costs
- Accident Costs
- Driver Training

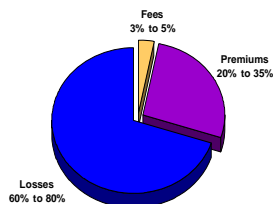


Canadian Ambu-Moose

### Fleet Safety Management Systems

- Fleet Management
  - Leadership
  - Driver Selection Standards
  - Driver Performance- identify high risk drivers
  - Vehicle Selection, Inspection, Maintenance
  - Accident Reporting/analysis
  - Program Evaluation
- EMS Practice/Policy
  - Safe Drive Policy
  - Seat belt use for all occupants
  - Equipment secured
  - Intersection policy
  - EVOC – Emergency Vehicle operators course
  - Communications
    - Cell phones / texting
    - In-vehicle communication

### Total Cost of Risk



### Corporate Cost of Risk

- Cost of risk
  - Typically represents 1 to 3 percent of total organization (for small companies may be higher).
  - Usually the highest cost are found in workers' compensation and liability depending on the type of company
    - EMS may have high WC cost due to patient handling or vehicle crashes
    - EMS may have high GL costs due to vehicle crashes and impact to general public or patients involved in crash
  - Is affected by retention levels and losses

### Direct Costs of Vehicle Crash

- Cargo Damage
- Vehicle Damage
- Indemnity (payroll) Costs of Injured EMS Personnel
- Medical Costs
- Loss of Revenue
- Administrative Costs
- Police Report
- Possible Effect on Cost of Insurance
- Possible Effect on Cost of Workmen's Compensation Insurance
- Aon Insurance Costs
- Storage of Damaged Vehicle

## EMS Specific issues

- Negative impact on EMS response times
- Negative impact on regional EMS resources
- Consequences of decrease of emergency care response capacity
- Negative impact on service morale and ability to recruit
- Loss of other skilled EMS personnel due to concerns regarding safety issues

## Indirect Costs of Crashes

- Lost Clients/Customers
- Meetings Missed
- Salaries Paid to Employees in Accident
- Lost Time at Work
- Cost to Hire/Train Replacement Employees
- Supervisor's Time
- Loss of Personal Property
- Replacement Vehicle Rental
- Damaged Equipment Downtime
- Accelerated Depreciation of Equipment
- Accident Reporting
- Medical Costs Paid by Company
- Poor Public Relations/Publicity
- Increased Public Relations Costs
- Government Agency Costs

## Costs of Motor Vehicle Crashes Worksheet

Direct Costs to the Organization	
Workers' compensation benefits	\$ _____
Healthcare costs	\$ _____
Increase in medical insurance premiums	\$ _____
Auto insurance and liability claims and settlements	\$ _____
Physical and vocational rehabilitation costs	\$ _____
Life insurance and survivor benefits	\$ _____
Group health insurance dependent coverage	\$ _____
Property damage (equipment, products, etc.)	\$ _____
Motor vehicle repair and replacement	\$ _____
EMS costs (ambulance or medvac helicopter)	\$ _____
Vehicle towing, impoundment and inspection fees	\$ _____
Municipality or utility fees for damage to roads, signs or poles	\$ _____
Direct Total	\$ _____

## Costs of Motor Vehicle Crashes Worksheet

Indirect Costs -	
Supervisor's time (rescheduling, making special arrangements)	\$ _____
Fleet manager's time to coordinate vehicle repair/replacement, etc.	\$ _____
Reassignment of personnel to cover for missing employees (less efficient)	\$ _____
Employee replacement	\$ _____
Overtime pay (to cover work of missing employees)	\$ _____
Re-entry and retraining of injured employees	\$ _____
Administrative costs (documentation of injuries, treatment, absences, crash investigation)	\$ _____
Inspection costs	\$ _____
Failure to meet customer requirements resulting in loss of business	\$ _____
Bad publicity, loss of business	\$ _____
Indirect Total	\$ _____
TOTAL	\$ _____

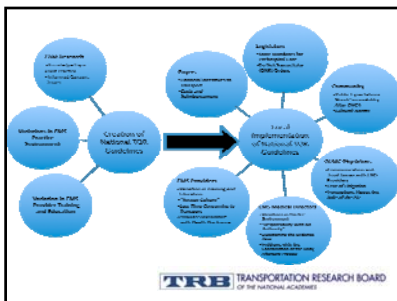
## Clinical Decision Priorities in Out-of-Hospital Cardiac Arrest

Comilla Sasson, MD, MS  
Robert Wood Johnson Clinical Scholar  
University of Michigan  
Department of Emergency Medicine

October 29<sup>th</sup>, 2009

## Guiding EMS Practice for OHCA

- Current EMS Practice for the Termination of Resuscitation (TOR) of Unsuccessful Efforts
- Evidence-based Recommendations
- Barriers to Implementing National Guidelines
- Next Steps



## Operational Issues

ISSUE	RECOMMENDATION
EMS Providers	<ol style="list-style-type: none"> <li>1. Variation in Training and Education</li> <li>2. "Success Failure"</li> <li>3. Issues in Transport</li> <li>4. Provider Recruitment and Staffing</li> </ol>
EMS Medical Direction	<ol style="list-style-type: none"> <li>1. Variation in Provider Employment</li> <li>2. "Responsibility With No Authority"</li> <li>3. Overlapping the Evidence Base</li> <li>4. Problems with the Coordination of the Body Aftercare Process</li> </ol>
Out-of-Hospital Cardiac Arrest	<ol style="list-style-type: none"> <li>1. Communication and Team Issues with Dispatch</li> <li>2. EMS Practices</li> <li>3. Flow of Information</li> <li>4. Prehospital Administration of the ED</li> </ol>

## Facilitators to Knowledge Transfer

- Improve Communication between EMS/Medical Directors and OLMC
  - Strengthen current AHA/ILCOR Guidelines on Termination of Resuscitation
- Standardize Educational Requirements
- Increase Coordination of Local Services
  - Streamline Body Aftercare and Family Support System

## What We Need to Know

There are several groups that are actively working to answer the many questions that have presented.



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## Community-Based Health Care



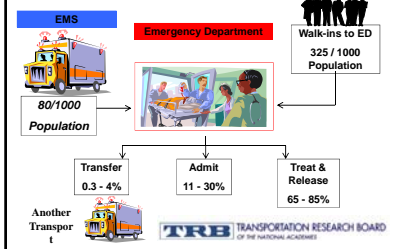
## More Users, More Needs



- Send the Unfocused to the emergency system
- Complicated, multisystem disease patients
- More needing transport assistance
- Example: Changing nature of ACS patients

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## Emergency Service Utilization is Predictable



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## Session 4: Information Sharing and Policy

### Session 4:

- Knowledge Transfer and Dissemination Government and Non-Government Platforms Challenges
- Standards/Specifications and Policy

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## State and Federal EMS Transport Safety Knowledge Transfer Platforms

EMS Subcommittee of the TRB Ambulance Transport Safety Summit

October 29<sup>th</sup>, 2009

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## State Initiatives Related to Crashing Ambulances

- Mandatory crash reporting:
  - PA, annual report generated
  - ND, but #s low
- Other programs:
  - CO, conference
  - Grant programs for equipment

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## Federal Initiatives

- National EMS Advisory Council -- Safety Committee
- Federal Interagency Committee on EMS -- Technical Working Group Safety Committee
- Transportation Safety Advancement Group -- US DOT/RITA ITS Joint Program Office

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## What's Missing from this List?

- Railroads
- Commercial Trucks
- Aviation
- Passenger cars
- Marine
- Transit
- ...



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## Summary - Feds

- Federal authority and interest lacking
- EMS transport safety is subordinate
- Committees and research are not enough
- EMS is the “missing mode”

## Non-Government

- Organization
  - TRB, ATS Ad Hoc, EMS Safety Foundation,
  - Web based
    - Responder Safety.com, Closecalls.com, EMSNetwork.org, Global EMS Forum, EMS Garage
  - Trade Journals
  - Foundation
    - FARE / Vision Zero
- Association
  - NAEMT, NAEMSMA, NASEMSO NAEMSP
- Accreditation
  - CAMTS, CAAS
- Coalition
  - Advocates for EMS – Kurt Krumpferman

## SESSION 4: Information Sharing and Policy

### Challenges – Knowledge Transfer/Dissemination

Kevin Roche  
Phoenix Fire Department, Arizona

## Challenges – Knowledge Transfer/Dissemination

- ▶ Size of the Fire and EMS Services
- ▶ Variety of Service Delivery Models
- ▶ Variety of Organizational Models
- ▶ Lack of Standardization
- ▶ Culture
- ▶ Tradition

## Fire Service Culture and Tradition

- ▶ Pride in Service to the Community
- ▶ History
- ▶ Tradition
- ▶ Change
- ▶ Risk-Takers  
Invincibility



## How To Get Through:

- ▶ Focused Message
- ▶ Consistent Message
- ▶ Involvement in the Standards Process
- ▶ Involvement in the Regulatory Process
- ▶ Good Research  
Conveyed in a Way that Can be Understood

## The National Academies Transportation Research Board EMS Safety Subcommittee

EMS Safety Summit  
Washington, District of Columbia  
October 29, 2009  
Summary

Arthur Cooper, MD, MS  
Columbia University/Harlem Hospital

## EMS Safety Summit Wrap Up

- Burden/Benefit
  - Safety Data
    - Multiple datasets – not interoperable, huge holes
    - Inconsistent definitions, incomplete collection
  - Economics
    - Vehicles: small fortune; crashes: many fortunes
    - Data-driven business and insurance case is strong
  - Ethics and Risk/Benefit
    - Decision rules ↓ crashes, but few use them
    - Technology also ↓ crashes, but few have it

## EMS Safety Summit Wrap Up

- Transport System Management
  - Fleet/Vehicle Operations Safety
    - Safety program/culture – crashes ↓ 60%
    - “Trust, but verify” – vehicle “black boxes”
    - Align rewards with safety, not profit
  - Operations Management
    - EMD ↓ hot responses, hence crashes
    - ITS: great promise in ↓ crashes
    - Dynamic deployment, visual systems ↓ crashes

## EMS Safety Summit Wrap Up

- Vehicle Safety – Assessment and Design
  - Vehicles
    - Our engineering colleagues are way ahead of us
  - Special Populations – Pediatric to Bariatric
    - Special populations → illustrative solutions
- Information Sharing and Research Priorities
  - Knowledge Transfer/Dissemination
    - The world is large...our "worlds" are small, and insular
  - Standards/Specifications/Policy
    - For vehicles, not patients or providers...must change!



## Solutions?

- National Incident Management System
  - Unified ICS (potential partnership with DHS)
- **T**ogether **E**veryone **A**chieves **M**ore
  - TeamSTEPPS (AHRQ/TriCare) may help
- Government can't (and shouldn't) do it alone
  - Interdisciplinary professional collaboration needed
- We all know what needs to be done
  - TRB White Paper → interdisciplinary NAs panel



## Thoughts To Ponder

- Public Health Answering Points
  - Health advice for patients at home
- No substitute for the human touch
  - Mid level providers/advanced practice medics
- PC based telemedicine in rural areas
  - Skype™ has shown us how to do it
- Fossil fuels will be prohibitively expensive
  - Medical transport only a last resort



## The www.GlobalEMSForum.org your public access gratis resource



## Safety in the Back? Ergonomic and Automotive Safety Challenges

What are the practices, technologies and challenges of ambulance safety design – in a spectrum of countries, a real world perspective

- **Introduction:**  
Mr. Darren Walter FRCS(Ed) FCEM – Emergency Medicine Physician, South Manchester, UK
- **A Systems and Interdisciplinary Perspective:**  
Nadine Levick MD, MPH, FACEP – Emergency Medicine Physician and Injury Researcher, EMS Safety Foundation, New York, USA
- **Automotive Safety and Engineering Challenges:**  
Gene Lukianov, Automotive Safety Engineer, Michigan Detroit, USA
- **Operational Ergonomics – Key issues:**  
Chris Fitzgerald CPE, EMS Ergonomist, Risk and Injury Management Services, Melbourne, Australia
- **Overview - Q & A**

## Safety in the Back?- IS a system

COMBINATIONS of ALL SCENARIOS MUST BE CONSIDERED

**ROAD ACCIDENT SCENARIOS**  
Frontal impacts  
Side Impacts  
Roadway Departures and Rollovers



**ATTENDANT POSITION SCENARIOS**  
• Seated (in position), belted in Designated Seating  
• "Out of Position", unbelted and/or ambulant

**PATIENT SCENARIOS**  
• Pediatric to Bariatric size and weight  
• Various levels of injury and medical need

## Safety in the Back? SO WHAT'S THE CHALLENGE?

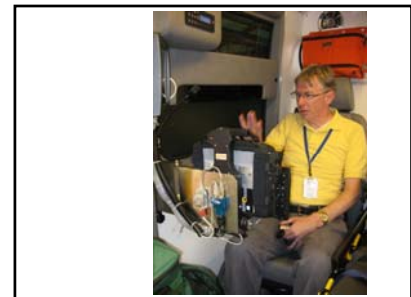
- Occupant Protection is a systems issue
- AVOID crashes with Driver Training, Operating Policies, Safety monitoring and feedback technologies, Ambulance conspicuity and Vehicle crashworthiness specifications
- Constrain Attendants SAFELY, ideally forward and rear facing
- Constrain Patients SAFELY, with shoulder belts
- SECURE all Equipment effectively
- Engineer Compartment Interior to be IMPACT FRIENDLY



## EMS Operational Ergonomics

### Presentation overview

- Defining the framework for consideration of human factors.
- Defining your population of users.
- Designing for tasks paramedic perform "in the back".
- Understanding how paramedics access, use & restow equipment.
- Balancing item accessibility with prevention of strike hazards.
- Design challenges.



## User Population

### Who will use the ambulance

- Female participation rates of up to 30 to 40 %.
- Height difference between a 5<sup>th</sup> percentile female & 95<sup>th</sup> percentile male is approximately 400 mm.
- User size needs to be accommodated in design for comfort & access to the patient & equipment.
- Need to balancing head & shoulder clearance with reach distance.
- What is the height, weight and "size" range of patients that are to be restrained on the stretcher.

## Standards Update

- ▶ NFPA – forthcoming meeting in December
- ▶ SAE – x2 standards underdevelopment
  - General vehicle crashworthiness and occupant safety standard
  - Specific equipment and occupant restraint standard
- ▶ ISO - ISO/AWI 39001 - Road-traffic Safety management systems
  - Recent update meeting in Canada

## ISO – 39001 Road-traffic Safety management systems



## SAE development



## Vehicles Update

- ▶ As of January 1, 2010
  - USA the Sprinter will be distributed by Mercedes and Freightliner
  - Canada the Sprinter will be solely distributed by Mercedes
- ▶ State policy developments
- ▶ EMS Safety Foundation Innovation Consortium new vehicle and fleet purchases

## Planning for 2010 EMS Safety Foundation Rettmobil Delegation?? May 5-7, 2010



## Rettmobil 2010 Delegation Registration of Interest



## Time line

November 2009 – June 2010

- ▶ TRB Subcommittee meeting Jan 13, 2010
- ▶ January 14<sup>th</sup> EMS Safety Foundation Webinar
- ▶ Rettmobil Delegation 2010, May 5-7<sup>th</sup>, 2010
- ▶ Workshop May 4<sup>th</sup>, 5<sup>th</sup> and 7<sup>th</sup>, Germany
- ▶ ICEM 9-12<sup>th</sup> June, Singapore
- ▶ Global EMS Forum Webinar June, 2010

## Thank you! Any Questions??

an electronic recording and a .pdf handout of this presentation awaits EMS Safety Foundation Members online

[www.EMSSafetyFoundation.org](http://www.EMSSafetyFoundation.org)

