

Link Conference 2010,
Halifax, Nova Scotia

'Building a Culture of Safety in Health Care' - Are You on the Ride of Your Life?



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

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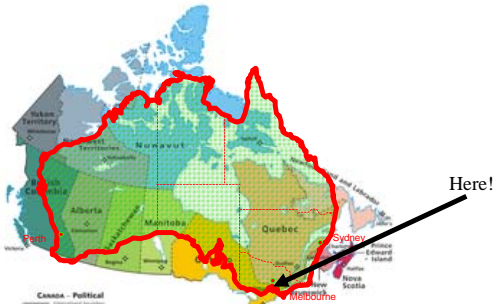
What I have been asked to cover today

- Ambulance transport safety "is just one part of the health care system."
- Patient safety...a hospital safety issue too?
- Issues with Ambulance manufacturing
- "It's an unsafe system...why?"
- Need for measurement for safer performance
- Creating a 'culture of safety' thru awareness, training, and incentive.

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



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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?
- What can we learn from international colleagues

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Outline

- I. Identification of ground EMS transport safety issues, hazards and areas of risk to patients, providers and public
- II. Highlight unacceptable mythology and challenges to advancing EMS transport safety
- III. Profile innovation, new safety technologies and strategies and knowledge transfer to enhance safety and reduce risks of ground EMS and patient transport

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Tragedy you don't want to be involved in

SUN NEWS Edmonton
 Sun, September 3, 2006
'Staff are very, very shaken'
Driver who collided with ambulance dies

By **AJAY BHARDWAL, EDMONTON SUN**

City paramedics are in shock and a family is in mourning after an ambulance headed to a priority call collided with a car at a busy north-side intersection, killing a 45-year-old woman.

"Certainly, our staff are very, very shaken, there's care given," said emergency medicine services chief Gene Boisjars.

Police and traffic investigators are now looking into the collision that happened Friday at Yellowhead Trail and 50 Street at the site of Edmonton's Luis Marquis.

Marquis died of blunt chest trauma, said a spokesman for the medical examiner's office.

Fatal ambulance crash probed
 By **JACQUELINE BOISJARS**
 EDMONTON — Paramedics are in shock at a fatal collision involving an ambulance on Friday that killed a 45-year-old woman.

City paramedics are in shock and a family is in mourning after an ambulance headed to a priority call collided with a car at a busy north-side intersection, killing a 45-year-old woman.

"Certainly, our staff are very, very shaken, there's care given," said emergency medicine services chief Gene Boisjars.

Police and traffic investigators are now looking into the collision that happened Friday at Yellowhead Trail and 50 Street at the site of Edmonton's Luis Marquis.

Marquis died of blunt chest trauma, said a spokesman for the medical examiner's office.

Family killed in collision with ambulance
 Call to police Wednesday, September 13, 2006 / 11:16 AM EDT
 An ambulance and a car collided Tuesday night on the Trans-Canada Highway east of Calgary, killing a 24-year-old man, his wife and infant daughter.

A Siksa First Nation ambulance was taking a patient to the Foothills Medical Centre when it and a Ford Escort collided at 10:30 p.m. near Range Road 284.

Calgary ambulances rushed to the scene and transported the ambulance's patient and crew to hospital, where they were reported in stable condition.

All three people in the Escort were pronounced dead at the scene. They were identified as a family from northwest Calgary, but their names were not immediately released.

The ChronicleHerald.ca
 October 17, 2006
 NEWS OPINIONS BUSINESS SPORTS ARTS & LIFE COMM

Patient dies in ambulance crash
 201's first in vehicle spins 20 metres into woods near 103 Hubbard's exit
 By **DAVID JIMMY DAFF**
 The Post 10 - 10:16 AM EDT

A Lunenburg County woman is dead and two paramedics were sent to hospital with serious injuries Wednesday after an ambulance veered off the road and crashed into the woods on the South Shore.

The single-vehicle accident occurred at about 10:30 a.m. on Highway 103 near the Hubbard's exit.

The ambulance was travelling west when it veered across the road and plunged into the woods, striking rocks and trees along the way. It ended up wedged between two trees, RCMP spokesman Sgt. Mark Callaghan said.

The highway was closed between exits 6 and 7 for several hours.

"We are co-operating fully with the RCMP," said Paul Hayward, spokesman for Emergency Health Services, who added that police are now in charge of the investigation to determine what caused the accident.

"It's a beautiful day here and it's a fairly straight stretch of road," Mr. Hayward said in a phone interview from the scene.

A 20-year-old patient in the ambulance was taken to the hospital with serious injuries. The ambulance crew were taken to hospital with serious injuries. The ambulance crew were taken to hospital with serious injuries.

At the time of the accident, the paramedics were on a "routine transfer with a patient on board going between facilities," Mr. Hayward said.

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Patient Safety UK- A routine concept...

Tuesday, 14 March 2006

NHS
National Patient Safety Agency

home public health professionals press/media industry

Building a safer NHS for patients

NPSA BOARD
 The National Patient Safety Agency Board

Designing future ambulance transport for patient safety

Background

In June 2005 the Department of Health (DH) set out a vision of how ambulance services can be transformed from a service focusing primarily on resuscitation, trauma and acute care towards becoming the mobile health resource for the whole NHS - taking healthcare to the patient in the community. The benefits include:

- patients will receive improved care by consistently receiving the right response first time, in time;
- more patients treated in the community
- greater job satisfaction for staff
- more effective and efficient use of NHS resources
- improvements in self care and health promotion

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But Patient Safety is just one part of this system

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EMS Transport Safety

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

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Balance of concerns and risk during transport

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

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Some odd USA and also Canadian 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

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Ambulance transport a serious transport safety problem...

- the most lethal vehicle on the road both per mile travelled and per vehicle
- is exempt from federal commercial fleet safety oversight (FMCSA)
- 2/3 fatalities not in the ambulance
- Exempt from most FMVSS standards

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Data...

- What is your transport safety record in your service?
- How can you improve if you don't have a meaningful measure of safety performance?
- Transport safety is not guesswork, it is a science

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ESC – Does your ambulance have it??

- Transport Canada announced that effective August 31, 2011, automakers must install Electronic Stability Control (ESC) technology in Canadian vehicles.
- ESC helps drivers stay in control when they need to swerve or brake suddenly to avoid an obstacle or turn corners on slippery roads.
- Vehicles equipped with ESC are involved in fewer severe collisions caused by loss of control, resulting in significantly fewer deaths and injuries

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So

- What's important
- What's not important

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- What's going to save your life
- What might take your life

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- What's going to hurt you
- What's going to protect you

- What is factual
- What is garbage

- What is new
- What is not new

Some new dimensions

- Vehicles – smarter, sleeker, safer – CHEAPER!
- Operations – new technology tools
- Interdisciplinary infrastructure – new global platforms

Systems safety of:

- Getting you, your patient and equipment in and out of the vehicle
- Providing patient care inside the vehicle
- Occupant protection in crash and near miss situations

Safety Performance

- Measurement
- Outcomes
- Technical expertise

What is a safe speed and how do we identify that?

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What is a survivable impact ?



12 mph (20 km/hr)?

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What is a survivable impact?

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



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What is a survivable impact?

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



~ 30 mph - survivable

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What is a survivable impact?

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



~ 60 mph - not survivable

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A survivable impact??



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A serious problem...

Transport related aspects -

- dispatch of EMS/Medical transport vehicles
- transport policies and protocols
- vehicle fleets and vehicle design
- vehicle purchase standards
- Intelligent Transportation Systems (ITS) technology
- driver training
- driver performance monitoring
- roadside and road design
- integrated traffic safety technologies
- scene safety and visibility
- safety data capture
- safety oversight

Transport Medicine

- Impact Biomechanics
- Transport Ergonomics
- Fleet Safety

A "Fleet" to many in Emergency Medical care means....



Safe Systems Approach



Source: Road Safety Branch, Infrastructure and Surface Transport Policy, Department of Infrastructure, Transport, Regional Development and Local Government, Australia.

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?

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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

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In the USA AND Canada there are more safety standards for moving cattle than for moving patients



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Absence of standards and oversight

- Challenges in identifying best practice
- Myriad of unregulated commercial products
- No safety performance standards
- Absent national safety oversight

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- What we need to consider, where is the 'bang for buck' in ambulance transport safety:

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Creating a Safety Culture

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

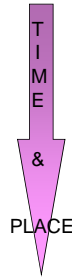
- Awareness
- Training
- Incentive

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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



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The Emergency Department (ED)



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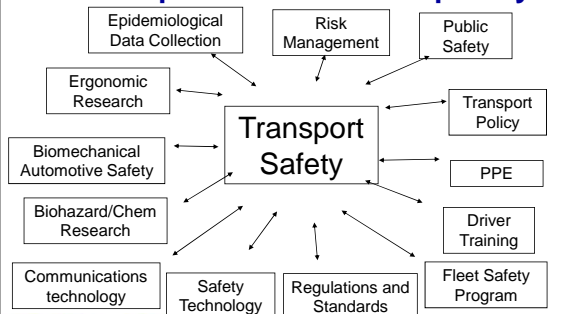
An ambulance is not an ED /ICU on wheels



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Ground Ambulance Transport Safety IS Complex AND Multidisciplinary



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Do we ask vehicle builders to write cardiac arrest protocols...?
Vehicle design and safety is not what we are trained to do!!!!



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Would we...?

Seeing that we are health care providers – lets look at it this way –

- Would we use medical equipment that was built by folks who were not technically qualified or trained biomedical engineers and who just said – “this device is safe”?
- Or would we expect them to be qualified in this field and that their products were tested in a meaningful way to ensure that they were safe?

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April 14th, 2008

Ambulance worker loses arm in accident - West Nyack, New York

An emergency service worker lost her right arm today after the ambulance in which she was a passenger crashed into a truck parked along Route 59 near the flyover to the Palisades Center mall.

Bonnie Ames, 20, was taken by helicopter to the Westchester Medical Center in Valhalla where she underwent surgery.

"She's out of danger, but she lost her arm," Raymond Florida, director of Rockland Paramedic Services said early this evening.

"We used multiple units from the jaws of life to extricate her," West Nyack Fire Chief George Drescher said. "She appeared to be seriously injured."

The paramedic van driver, 19-year-old Scott, was taken to Westchester Medical Center, said...



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April 20, 2008..??



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Child injured after being struck by ambulance

Sunday, April 20, 2008 9:40 AM CDT

SPRINGFIELD, Ill. (AP) - Springfield police say a 7-year-old child is hospitalized with life-threatening injuries after being struck by an ambulance.

Police Lieutenant Kenny Winslow said the unidentified child was riding a bicycle about 8:30 p.m. Saturday when the ambulance struck him, throwing him from the bike.

After treatment at the scene, the child was loaded into the ambulance and taken to St. John's hospital. A hospital spokesman said he was still being treated in the emergency room late Saturday.

[Winslow said the ambulance was not responding to an emergency when the accident occurred.](#)



Springfield boy hit by ambulance dies

Monday, April 21, 2008 6:31 PM CDT

SPRINGFIELD, Ill. (AP) - A 7-year-old boy has died after being struck by an ambulance while riding his bike over the weekend.

Trayvonte M. Edwards was pronounced dead at 8:37 a.m. Monday morning at St. Louis Children's hospital, the Springfield State Journal-Register reported on its Web site. A spokesman with the St. Louis medical examiner's office says a cause of death has not yet been determined.

Police say Edwards was trying to cross a street on the east side of town around 8:30 p.m. Saturday.

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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 Lewes-Rehoboth joint fire company substation in Angola.

The Mid-Sussex Rescue Squad ambulance was transporting to Beebe Medical Center with a patient, 2 MSRS 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 Milford Fire Company ambulance he was riding in, while returning from a run. Additional details on this morning's crash will follow.



In this vehicle...



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October 31, 2008 - Kentucky



April 30, 2009 - Tennessee



August 2009 – Impaired...



Posted: Thursday, August 13, 2009
Updated: August 13th, 2009 05:04 PM GMT-05:00

Kentucky EMT Indicted on Murder Charges after Crash

By Andy Alcock/WLKY
Story by wlv.com

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, Vickie Whobrey, 54, died of her injuries from the wreck.

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



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EMT Indicted On Murder Charges

Tammy Brewer Driving Ambulance Involved In Fatal 2008 Crash

By Andy Alcock/WLKY

POSTED: 11:36 am EDT August 13, 2009

UPDATED: 6:17 pm EDT August 13, 2009



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, Vickie Whobrey, 54, died of her injuries from the wreck.

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

Ambulance, TDOT truck collide on I-65; ambulance driver killed

Just before 3 p.m., a Rural/Metro ambulance transport appointment ran into a Tennessee Department of Transportation emergency lane, according to Metro police information.

The ambulance driver--David Cline, a firefighter in Ft. Vanderbilt Medical Center, where he died.

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

Nashville firefighter and Rural/Metro employee Evans 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.

TDOT vehicle driver Robert Green, 60, of Columbia was transported to Vanderbilt Medical Center where he is in stable condition, Mumford said.

As of 5:45 p.m., traffic on the northbound lanes of I-65 was moving, but southbound traffic was moving slowly, Mumford said. There were also significant delays on I-440.



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December 2009



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January 14, 2010

WARREN COUNTY, N.J. NEWS
Real-time news for Belvidere, Phillipsburg and more

- WARREN COUNTY NEWS with THE EXPRESS-TIMES
- The Express-Times
- Warren Co. arrest headlines
- Lehigh Valley crash, time, news, updates
- Warren County news on NJ.com
- Report a news tip, community article
- Post video / photos
- Contact The Express-Times newspaper
- Get email updates

Accidents, Breaking News - Ambulance accident on Route 519 in White Township claims patient in back - UPDATE

By Express-Times staff
January 14, 2010, 5:13PM



Rescue workers from various agencies work to free the driver of an Atlantic Ambulance after the vehicle crashed into a tree along Route 519 in White Township.



The Express-Times, great headlines
The Express-Times

A patient in the back of an ambulance was killed this afternoon in Warren County when the vehicle swerved suddenly to the right and crashed into a tree, New Jersey State Police said at the scene.

Knowledge Transfer
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February 1, 2010



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Sept 16, 2010

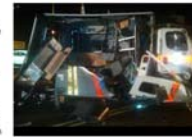
SUV Rips Side Off Ambulance in Deadly Maryland Crash

EMS Crew Escapes Serious Injury, Three Civilians Killed



SUSAN PHILLIPS, WUSA9 | Thursday, September 16, 2010

DISTRICT HEIGHTS, Md. (WUSA) - A violent collision between an SUV and an ambulance has killed three people and sent two paramedics to the hospital.



Mark Brady, spokesperson for Prince George's County Fire and Rescue, says the crash happened shortly after midnight in the 5600 block of Marlboro Pike in District Heights. According to Brady, investigators believe ambulance 804 was traveling west on Marlboro Pike on its way to an overdose call on Tamar Place when it came upon a GMC Suburban traveling eastbound in the westbound lanes at a high rate of speed.



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- This IS a Transportation and Automotive Safety issue

Safety is a tool to save

- Lives
- Time
- Money

must be evidenced based

Important...

- Ergonomics and automotive safety issues are interrelated
- Crashworthiness priorities override the ergonomic issues

The laws of physics prevail...

- and they don't care what your job title is or if you are a patient, a provider or a member of the public

Science behind Policy

- "For successful technology, reality must take precedence over public relations, for Nature cannot be fooled."

Richard P. Feynman 1988

MedStar Ambulances Will No Longer "Run Hot" When Transporting Cardiac Arrest Patients (4/21/2010)

- "MedStar ambulances will no longer 'run hot' - when paramedics inside are giving chest compressions to patients in cardiac arrest, officials say." This "policy, which took effect Friday, will affect about 1,400 of the more than 100,000 calls to which MedStar responds annually in the 15 Tarrant County cities it serves."

Safety is Good Business

The screenshot shows the homepage of the Federal Motor Carrier Safety Administration (FMCSA). The main heading is "Safety is Good Business—Crashes Hurt Your Bottom Line". Below this, there is a section titled "Overview" with bullet points: "Getting Started with FMCSA Registration", "Initiatives to help you meet your Safety Goals", "CDL Requirements", "What Happens if I Don't Comply With Regulations?", and "Industry Best Practices". There is also a section titled "Why Safety is Good Business" which states: "Crashes are devastating in terms of fatalities and injuries, financial costs, damaged reputations, the inability to attract and retain good drivers, and general goodwill in the industry and community."

A problem

2007 Insurance data –

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

2003 Insurance data –

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



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Expensive....

The screenshot shows a news article from The Huntsville Times. The headline is "Ambulance suit gets \$3.1 million". The sub-headline is "Meridianville teen killed in wreck with speeding vehicle". The article is dated Tuesday, May 01, 2007, and is written by David Holden. The text of the article states: "A federal jury awarded \$3.1 million in damages Friday to the family of a Madison County woman who was killed in a collision with a speeding ambulance from Tennessee in 2005. A felony charge of manslaughter is still pending in Madison County Circuit Court against the ambulance driver, Charles Christopher Eakes of Tennessee. Dianna Christine Bowden, 18, of Meridianville died in a two-vehicle crash Oct. 13 involving the ambulance owned by Lincoln County Medical Center Emergency Services. The wreck occurred around 9:45 p.m. at U.S. 231431 and West Limestone Road, about seven miles north of Huntsville."

Very Expensive

Law & Justice @ ambulances firegeezzer on 30 Sep 2008 09:10 am

\$24 Million Judgement Against AMR

AN ALAMEDA COUNTY, CALIFORNIA, JURY ORDERED AMERICAN MEDICAL RESPONSE (AMR) to pay nearly \$24 million damages to a man who was permanently paralyzed after a traffic accident involving one of their ambulances.

On April 16, 2007, Louis Del Barba, 85, was driving his auto and making a turn when he was broadsided by the ambulance. The ambulance's speed was measured at 65 mph in a 35 mph zone. Experts agreed that such a speed, in rush hour conditions, was reckless and unsafe.

A press statement released yesterday by the plaintiff's lawyers stated:

Mr.

Del Barba had the right of way and was wearing a shoulder and lap seat belt when the crash occurred. As a result of the accident, he received numerous traumatic injuries and is paralyzed completely, save for some movement of his head and left arm. He is constantly dependent on a ventilator. Doctors believe that he can return to his 110-year-old family home if there are funds to fit a room for medical care. The jury felt strongly that Mr.



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

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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



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What do we know now??

- Intersection crashes are the most lethal
- There are documented hazards, some which can be avoided
- Occupant restraint with standard belts is effective. (Over the shoulder belts for patients, with the gurney in the upright position where medically feasible)
- All equipment should be locked down
- Some vehicle design features are beneficial - automotive grade padding in head strike areas, seats that can slide toward the patient
- Head protection??
- Electronic Driver monitoring/feedback systems appear to be highly effective



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Predictable risks

- Fatal crashes more often at intersections, & with another vehicle (p < 0.001)*
- 70% 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**
- > 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, Pirralo RG, Kuhn EM, Prehosp Emerg Care 2001 Jul-Sep;5(3):261-9
**Becker, Zaloshnja, Levick, Li, Miller, Acc Anal Prev 2003
***Maguire, Hunting, Smith, Levick, Annals Emerg Med Dec 2002
#NIOSH: 2003
##Ray AM, Kupas DF, Prehosp Emerg Care 2005 Dec; 9:412-415
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Current accepted safety design and transport system technologies are being ignored, and worse...



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October 29, 2009 TRB EMS Transport Safety Summit



What could you learn from the National Academies – right NOW and gratis

- The realm of burden and benefit
 - measuring the safety of the system
 - determining the economic, ethical and risk benefit challenges
- Transport System Management
 - fleet safety and oversight technologies and policies
 - operations management – dispatch, congestion routing, deployment of resources, benchmarking
- Vehicle safety
 - occupant protection design and testing
 - Vehicle performance safety
 - vehicle and personnel human factors issues
- Dissemination and Policy
 - Knowledge transfer
 - Standards, specifications and policy



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Its out there NOW

- TRB 2009 Summit – addressed the key and interdisciplinary issues, in one day – please seek that information out.
- There have been two TRB Summits held, 2008, 2009 and both with vehicle engineering and transportation systems technical expertise
- See www.trb.org, and for the Summit archives: www.objectivesafety.net/TRBSummit2008.htm www.objectivesafety.net/TRBSummit2009.htm



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Invehicle technologies to enhance transport safety

- Aftermarket in vehicle electronic e-safety devices with monitoring and feedback

Human Interface approaches

- Hardware fitted to the vehicle
- Non hardware App Driven cellular technology

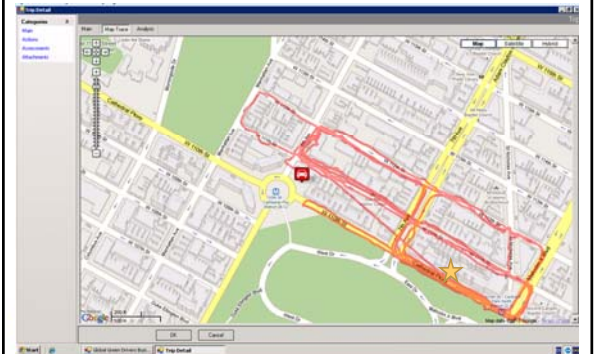
New cost effective App driven innovation



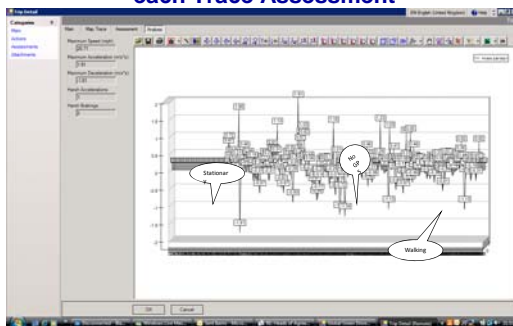
GPS and GPRS status

Driver and vehicle ids

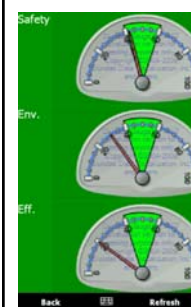
Realtime mapping from London for 2.5hr of a trip of attempting to park in NYC after a snow storm and whilst 'Law and Order' filming was underway



The analysed system data that sits behind each Trace Assessment



GGD Smartphone views



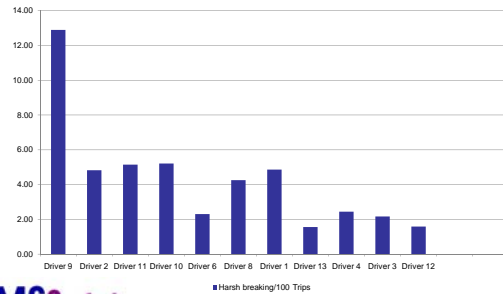
Driver's Individual performance against company set performance targets in the system

- Needle points to individual driver performance against targets
- Green area represents the difference between standard and stretch targets
- Goals can be varied by region, market, team as required
- Performance is updated and presented in real time.

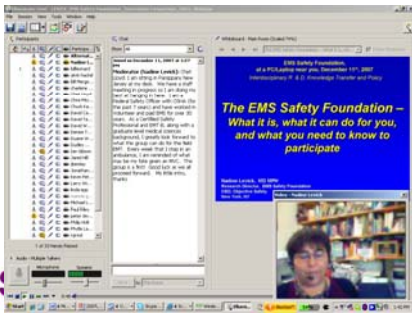
How did the UK pilot drivers perform??

Name	Total distance (Miles)	Total number of trips	Distance per Trip	All Breaking <math>< 0.0</math>	Harsh breaking <math>< 0.0</math>	Severe Harsh breaking <math>< -0.6</math>	Harsh breaking/1,000 Mile	Severe HB/1,000 Mile	Harsh breaking/100 Trips		
Driver 9	11,972	194	62	16,066	25	16	1341.96	2.09	1.34	83	12.89
Driver 2	12912	394	33	5,217	19	7	404.04	1.47	0.54	13	4.82
Driver 11	7,433	136	55	5,164	7	5	694.74	0.94	0.67	38	5.15
Driver 10	5,733	96	60	2,169	5	1	378.34	0.87	0.17	23	5.21
Driver 6	6939	261	27	9,254	6	3	1333.62	0.86	0.43	35	2.30
Driver 8	2,365	47	50	768	2	1	324.74	0.85	0.42	16	4.26
Driver 1	9179	144	64	9,972	7	3	1086.39	0.76	0.33	69	4.86
Driver 13	7,337	321	23	2,000	5	4	272.59	0.68	0.55	6	1.56
Driver 4	7,556	164	46	1,463	4	1	193.62	0.53	0.13	9	2.44
Driver 3	9,479	231	41	2,394	5	2	252.56	0.53	0.21	10	2.16
Driver 12	5,497	63	87	1,516	1	1	275.79	0.18	0.18	24	1.59

Harsh Braking per 100 trips



The EMS Safety Foundation www.EMSSafetyFoundation.org 2010 Rettmobil Delegation



The EMS Safety Foundation: A practical and functional model

Interdisciplinary and Operational and International

- Innovation
- Collaboration
- Knowledge transfer

R & D “Ripoff and Duplicate”

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

Automotive engineers addressing EMS Safety Foundation Workshops





Careflite's new vehicle



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Manitoba's new fleet



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Manitoba Health is looking to act on its original plan by implementing a pilot project, giving the RHA's a year to test the Sprinter design to see if it could be a replacement to the current Fleet Mac ambulance design.

According to Christenson, 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 Christenson.

Christenson 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.

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Collaboration and Outcomes

- Interdisciplinary Collaboration is what is key – not orthopedic folks talking to cardiologists – BUT collaboration between the health care folks appropriate automotive and occupant protection engineers and transportation system design, ergonomists and industry standards that make sense – and
- Meaningful measures of outcome and performance

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Technical Collaboration is key

- We are NOT the experts in this science
- We cannot afford to play the silo game here, it is costing lives, time and money
- We MUST have a meaningful evidenced based approach to design, operations and policy
- We must be outcomes driven

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this vehicle is safety crash tested by automotive experts



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Unlike this vehicle



EM
FOU

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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?

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Fleet Mix ?



Were we safer in the Cadillac???



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Is this acceptable...?

- There are ambulances rolling out of the show room on a daily basis – as we speak – being designed by health care providers and built by after market retrofitters, who are not at all governed as are other passenger vehicle manufacturers by the standards set by automotive engineers

Risk/Hazards

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

Goals

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

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

EMS Transport Safety

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

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

Conclusion

- EMS transport has serious hazards and safety issues
- Major advances in EMS safety research, infrastructure and practice over the past 5 years
- Development of substantive EMS safety standards is a necessity and a reality
- Multidisciplinary safety issue that EMS cannot solve internally
- 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, transportation and occupational safety

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And....

- It is no longer acceptable for EMS to be functioning outside of transportation, automotive and PPE safety standards for prevention of and protection of EMS providers and the public from injury and death

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Thank you! Any Questions??

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



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