“Data Collection and Analysis for Safety Monitoring”

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Emergency Medical Service

- 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 and share with our international colleagues
An interhospital transport? “Do no harm....”?

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

Communication Technology trends

- 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
Data Collection

- Fleet performance and personnel safety
  - Your service – operational data
  - National data
- But before you write your data capture policies….

FARS – A National Data Set?
Small numbers – but NO data captured from 20%

of the USA in 10 years

Total Fatalities Per 100 Million Population
1996-2006

Data Collection
National data

But before you write your data capture policies….

USA Ambulance Transport Safety Data, ICEM 2010

Fundamentals - Data definitions
- What is an ambulance
- What is an ambulance crash
- What is an injury
- What is a death
- What is an ambulance transport related injury or death

http://www.objectivesafety.net/ICEM2010poster.pdf

Key elements to fleet transport safety policies

- Vehicle/Fleet Safety
- Occupant protection
- Driver performance monitoring and feedback
- Hours of service
- Driver/provider wellness and fitness
- Driver/provider impairment
- Public safety

Transport Medicine
Impact biomechanics

- Crashworthiness
- Vehicle design
- Occupant protection

Transport Ergonomics

- Operational tasks
- Human factors analysis
- Range of reach
- Patient loading and unloading

Fleet safety

- Operational policies – dispatch, safety
- Fleet mix
- Vehicle selection – safety, ESC, loading height
- Driver performance and monitoring
- Scene safety
- Visibility and conspicuity
- Safety measurement and management

Change and Innovation

- Improved data systems for injury
- Enhanced data on denominator
- New technologies
- New policies/standards
- Interdisciplinary collaboration

Fatal injuries among EMTs and paramedics, 2003-2010*

- Aircraft incidents: 34%
- Struck by vehicle: 32%
- Other transportation incidents: 11%
- Other: 8%
- Assaults and violent acts: 7%

Total = 97

* Data for 2010 are preliminary. Percents may not add to 100 due to rounding.
Source: Bureau of Labor Statistics, Census of Fatal Occupational Injuries
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

Cases with days away from work among EMTs and paramedics, 2010

- In lifting: 38%
- Overexertion: 56%
- Other: 18%

Number of days away from work among EMTs and paramedics, 2010

- Total cases = 8,360
- Total = 8,360
- 1 day: 24%
- 2 days: 10%
- 3-5 days: 16%
- 6-10 days: 10%
- 11-20 days: 14%
- 21-30 days: 6%
- 31 or more: 4%

Rules/Policies Addressing Known Hazards

- Federal Motor Carrier Safety Administration (FMCSA)
  - Cell phone use – November 2011
  - Hours of Service – December 2011

Federal Motor Carrier Safety Administration - FMCSA

- http://www.fmcsa.dot.gov/
Nov 2011, Hand Held Cell Phone Ban

Dec 2011, New FMCSA Hours of Service

Safe Practices for Motor Vehicle Operations
ASSE/ANSI Z15.1 2012

Newly Revised ANSI/ASSE Z15.1-2012 Standard is now available.
- These practices are designed for use by those having the responsibility for the administration and operation of motor vehicles as a part of organizational operations.

Z15.1 Technical Brief
http://asse.us2.list-manage.com/track/click?u=c607f19210bc178f7ceb6d716&id=a311862ffcc6=8007d740a6

What Z15 encompasses
- Safety Program
- Safety Policy
- Responsibilities and Accountabilities
- Driver Recruitment, Selection and Assessment
- Organizational Safety Rules
- Orientation and Training
- Reporting Rates and Major Incidents to Executives
- Oversight
New Safety Data
- TRB 2012
- 2011 National EMS Assessment
- 2011 NFPA
- TZD EMS
- NCHRP 17-51
- FARS/MMUCC
- NEMSIS
- BLS

National EMS Assessment
December 2011

NFPA Data Systems Analysis
November 2011

Increasing focus
- TRB - ANB10(5)
- RITA/ITS/DOT
- Traffic Records Forum
- DHS/NIST/NIOSH
- TIMS
- ASSE
- SAE
- EMS Safety Foundation

A lot is now possible and for less!
- Driver behavior
- Vehicle behavior
- Roadside ITS
- Fuel consumption/Economics
- Resource modeling

Fleet Management technologies
- Zoll rescueNet and road safety fleet management systems
- ACETech/Ferno
- FleetEyes – Intermedix
- Marvils
- Telematicus
- Priority Dispatch
- Optima
- Northrop Grumman
Transport performance

- Driver training?
- Real time safety performance outcomes?

Invehicle technologies to enhance transport safety

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

What about changing driver behavior in the real world??

AN OPTIMAL SOLUTION FOR ENHANCING AMBULANCE SAFETY: IMPLEMENTING A DRIVER PERFORMANCE FEEDBACK AND MONITORING DEVICE IN GROUND EMERGENCY MEDICAL SERVICE VEHICLES

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REAL WORLD APPLICATION OF AN AFTERMARKET DRIVER HUMAN FACTORS REAL TIME MONITORING AND FEEDBACK DEVICE: AN EMERGENCY SERVICE PERSPECTIVE

Nadine Levick
Solutions Safety LLC

Human Interface approaches

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

Spectrum of dimensions

- CAD
- Resource allocation
- Fleet performance –
  - Monitoring: System that gives management data of vehicle efficiency and use
  - Feedback: Directly to drivers at the wheel
- Public Alerts

Zoll Online – RescueNet

Road Safety

ZOLL Online

Built for an effective on-site experience.

With ZOLL, online care access is all of your company's trusted emergency response software for tele and EMS operations, too. ZOLL Online offers powerful personalization that allows ZOLL customers to administer all their ZOLL applications from one place, streamlining the road for beneficial alternative data that are

ZOLL Online is being offered as an extension of our software services. Getting started with ZOLL Online is simple. Sign up today and get started for free. It’s the fastest way to join our customers and organizations, and start getting the most out of their resources.

To signup or login, simply click here or visit www.zoll.com
Monthly Driver Reports

- Identifies high risk behaviors
- Provides real time feedback to driver
- Provides reports for employee evaluation

Sustained Measurement of Success at Sunstar Paramedics

Ferno Acetech

ACETECH\textsuperscript{TM} Web
- Mapping, reports, alerts, hotspots, vehicle data
Niagara – Acetech Integrated Vehicle Intelligence System

Fully integrated, vehicle performance monitoring and control system with on-board intelligence.

- Safety Systems
- Eco-Run Module Benefits
- Asset Protection Benefits

Safety System (Integrated into AVI)

- Speeding infractions, Unbelted, Unsecured occupants
- Lights and siren compliance
- Create Driver Safety Reports- provide feedback to employees
- Set pre-defined speedimiters

Niagara EMS Decrease in Speeding Infractions

Fleet eyes

Telematicus

GGD views

A smart phone App that is a safety tool
Telematicus

Fleet Management capability

Vehicle database
- Individual vehicle/data
- Fleet mileage collection/Checklists
- Link to other systems (SAP, Fleet)

Maintenance & Service Plans
- Repair history & Scheduling
- Action planning

Reporting
- Export to Excel for manipulation
- Scorecards views, Crystal Reports reporting
- Direct Feedback

Optima

Demand/Resource analysis and modeling and base location planning

Northrop Grumman

- Operationally Demonstrated

These technologies:

- Realized dramatic sustainable change in drivers attitude toward safety
- Provide evidence based data to use for individual driver training and refresher courses
- Able to identify drivers that fail to align themselves with our mission of safety
Marvlis

- The dashboard calculates:
  - current percent of demand coverage
  - three closest vehicle recommendations for recent incidents
  - realistic travel time estimates for each possible responder

Marvlis

- The web interface:
  - individual choice of reference maps
  - integration of AVL/ARL and other live feeds
  - native Android client
  - creation/update of spatial data direct to ArcGIS Server
  - customization options to extend functionality

Priority Dispatch

SAAB

911ETA – Integrating geolocation of Emergency Vehicles and the Public

911ETA

- Alerts the public in the vicinity of responding emergency vehicles.
- Motorists are alerted on their Smartphones or in-dash navigation system
- Takes exact location of each responding emergency vehicle (Police/Fire/EMS) and reports that to other responders.
- Allows Emergency Vehicles to improve response times and greatly reduce accidents.
## Untapped Opportunities: Resource Utilization

- Emergency medical dispatch is a critical gatekeeper for resource allocation and distribution
- Paramedic versus emergency medical technician
- Air medical versus ground transport
- Critical care ground transport units
- Traffic and bystander management

## DATA: EMS IS NOT AN ISLAND

- Impact of formally trained emergency medical dispatchers on resource utilization and patient outcomes
- Impact of mandatory restraint use on EMS personnel and patient injury patterns
- Fatalities
- Inclusion of EMS in traffic incident management plans/drills

## Relative benefit: Data Sharing Between PSAPs, the Scene, Emergency Response and Hospitals

- Predictors of Injury Severity
- Mobile Apps
- Route selection & guidance

## Model Inventory of Emergency Care Elements “MIECE”

- Having access to that technical knowledge supports changes to improve safety practice
Air EMS is a role model for safety initiatives and focus

An Aviation Safety Plan

Air Safety Approach

- Safety Program Planning
- Evaluating
- Analysis of Safety Performance
- Analysis of Safety Information and Data
- Analysis of Risk Profiles and Plans

Fleet Mix
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.

So now there are -

- New Tools
- New Collaborations
- New Platforms
- New Events
- New Organizations
- Webinar, Podcasts, Blogs, Skype and Twitter

Goals

- Standards for safety
- Policy based on Science
- Databases to demonstrate outcome
Thank you!
Any Questions??
Electronic handout and resources available online
http://www.objectivesafety.net