Implementation of a Sustainable Interdisciplinary Emergency Medical Services (EMS) Transport Safety Innovation and Knowledge Transfer e-platform

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The EMS Safety Foundation Consortium

Objective

- To design, implement, and sustain a purpose developed e-platform for interdisciplinary collaboration and transfer of knowledge from research to practice in EMS transport safety

Mission

- 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.

Why now?

- Operating optimally in a transportation environment that is largely devoid of specific safety standards for the hazards and risks present
- Bridge the gap between what technical information exists and what is accessible and applied to EMS

Absence of standards and oversight

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

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
Burden
2010 Insurance data
- 35 crash claims for every one medical liability claim
- 1 in 4 EMS workers have a career ending back injury in the first 4 years
- back injury is the number one reason for leaving EMS

Balance of concerns and risk during transport
- Response and transport time
- Clinical care provision
- Occupant safety/protection
- Public Safety

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

and who's life was he racing to save?

Some odd USA 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

this vehicle is safety crash tested by automotive experts
Unlike this vehicle

ESC – Does your ambulance have it??

- 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.

1980’s Then....

And NOW!....

The science of lifting & loading

Data...

- What is your transport safety record in your service?
- What can you lift safely? Can you reach the equipment you need?
- How can you improve if you don’t have a meaningful measure of safety performance?
- Safety is not guesswork, it is a science.
Operational Process
- A lean infrastructure
- Focus on information dense content
- Skewed towards innovators
- Optimize use of state of the art virtual interactive technologies
- Leverage use of social media tools
- Minimize travel and face to face meeting

Methodology
- An electronic virtual environment/consortium was established to create an end-user driven forum bridging operational EMS services with specific technical fields addressing EMS transport systems safety

Methodology
- Communication platform identified as ‘Webinar’ VOIP technology with secure electronic access to interactive interdisciplinary presentations, recordings, handouts and workshops combining onsite and virtual offsite participation
- Participants essentially self selected

The EMS Safety Foundation Webinar platform

Participant selection

Key 5 Safety Priority areas of focus
Here is what you sent in:  n = 155
Relative Priority Issues

- Priority Number one
  - Vehicle ops - 29%
  - Ambulance design - 27%
- Priority Number two
  - Ambulance design - 35%
  - Vehicle ops - 29%

Big issues are

- Transport
  - Vehicle
  - Vehicle operations
  - Scene
- Patient handling
- Equipment
  - Protective and other

Approach:

- 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
- A not-for-profit institute

Goals

- The primary goals of bringing this unique group of folks together are to:
  - Share pooled best practices
  - Integrate key technical expertise to address common challenges
  - Advance new multidisciplinary research projects
  - Translate safety technology from appropriate related technical areas to EMS
  - Knowledge transfer from research to practice

The EMS Safety Foundation:
A practical and functional model

Interdisciplinary and Operational

- Innovation
- Collaboration
- Knowledge transfer

Structure

- Innovation Consortium
- Technical Expert Panel
- Advisory Board
- Operational Team
- Management Board
- Corporate Sponsors
- Corporate Partners
- Interns
Innovation Consortium

- Small volunteer rural EMS services
- Major metropolitan EMS services
- Private patient transport services
- EMS Associations
- Interns

Technical Expert Panel

- Transport engineering
- Automotive safety
- Ergonomics and human factors
- Occupational safety
- Patient Safety
- Public Safety
- New information technologies
- Data Management
- Risk Management
- Systems safety research.
- Public health

Oversight and Support

- Oversight
  - Advisory Board
  - Management Board
- Support
  - Membership Dues
  - Corporate Sponsors/Partners

Results

- The e-platform, launched January 2008, utilizes a user friendly interactive Webinar program.
- The >360 participant consortium includes major urban municipal EMS services to small volunteer rural services, and a spectrum of technical experts, from North America, Europe, Scandinavia and Australasia: automotive and transportation engineers, ergonomists, and public health researchers.

Results

- Real-time and asynchronous access is 426,292 accesses from 26,306 distinct addresses.
- Interactive and interdisciplinary Webinars are held every 8 weeks.
- Biannual workshops addressing topic areas identified as gaps in systems safety knowledge, and an annual international best practice field trip are also conducted.

www.EMSSafetyFoundation.org
Results
- Three fleets of innovative prototype vehicles have been developed, manufactured and implemented in North America and Europe based on this interdisciplinary technical input, a fourth is underdevelopment.
- Ergonomic operational task analysis and measurement innovation has been performed.
- General advances in fleet and operational safety practice and policy throughout the consortium have been embarked upon.

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.

What is the result of the EMS Safety Foundation’s activities??
- Networking
  - Opportunities to build relationships with like minded colleagues and also technical experts across a spectrum of safety related disciplines.
- Innovation Community
  - A regionally diverse community of EMS services and providers all focused on the mission of innovation and information dissemination.
- Collaborative Consortium
  - A unique opportunity to expand and optimize decision making, purchase approaches and impact regional policy.

Knowledge transfer and information sharing
Automotive engineers addressing EMS Safety Foundation Workshop

Ergonomic Challenges

Automotive technical input

Loading height – size matters
European EMS Interdisciplinary Innovation Delegation

Rettmobil 2008-2011

Rettmobil is -
- A major European Emergency Rescue Congress, Trade show and Symposium
- Held in Fulda, Germany
- Established in 2001
- Attended by ~20,000 attendees
- Brainchild of Prof Peter Sefrin

Birds eye view

EMS Safety Foundation Rettmobil Interdisciplinary Delegation

Workshop May 2009 – Rettmobil Germany
2010 Rettmobil Interdisciplinary Onsite and Webcast Workshop

Lessons from 2009 Rettmobil Delegation

FORWARD FACING ATTENDANT SEATS
EVERYTHING WITHIN ARMS REACH WHILE REMAINING BELTED

Live from Rettmobil 2010, 2011 recording for gratis public access at www.EMSSafetyFoundation.org

Rettmobil 2011
PodCasts - with Kyle Bates in ‘First Few Moments’

- Latest Podcast - Chris Fitzgerald, our EMS Safety Foundation’s Director of Human Factors and Ergonomics shares some key points on lifting and moving patients and equipment - [http://firstfewmoments.com/?p=742](http://firstfewmoments.com/?p=742)

Innovation in back strain measurement

Swedish industrial designer meets North American Ambulance builder
Achievements

- Having access to interdisciplinary technical knowledge supports changes to improve safety practice

Muskoka EMS – Canada 2009

Old design

New design

New vehicle Innovation - 2010

Texas - Careflite’s new vehicle
and From this... October 2010 from Western Eagle County Ambulance District, Colorado

To this, in September 2011!

Pittsburgh Childrens Hospital
The new Oslo Ambulance

2011 Hands on Workshop

Support of new NAEMT Safety Course
Active Relationship with National Academies Transportation Research Board

- Limited to a small spectrum of forward thinking EMS services, who are focused on the benefits of interdisciplinary collaboration and innovation
- Not representative of EMS generally
- Lean infrastructure, limited resources
- Operational in contrast to academic

Interdisciplinary Collaboration and Outcomes

- Collaboration can be facilitated between EMS and appropriate technical expertise - automotive and occupant protection engineers, transport system design, ergonomics and human factors expertise, safety science and industry
- Is key to facilitating and enhancing the development of innovative solutions
- Meaningful measures of outcome and performance improvement can be demonstrated

Conclusion

- Establishment of a sustained interdisciplinary forum for transfer of knowledge from research to practice has been achieved through a secure virtual access network, in a cost efficient manner
- Demonstrated to be accessible to a spectrum of end users
- Has resulted in development of innovations in vehicle design and operations policy for safer EMS transport.

Thank you! Any Questions??

Handout is available online