Wireless Distribution and Use of Biosensor Data

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During emergency response, use of wired bio-sensors creates problems for the response workers. It is difficult to transport patients and checking of data requires that you to be next to the patient.

This presentation reports on a work in progress regarding the development of a wireless bio-monitor system that supports distribution and use of biosensor data by all involved parties during emergency response.

The system is being developed in close cooperation between doctors, paramedics and information technology specialists using qualitative methods including ethnographically inspired field work and simulations of future work.

The system consists of small bio-monitors with sensors and a unique identifier which is placed onto the victims. The bio-monitors communicate wirelessly with one or more base-stations, which distribute the signals locally at the incident site and to remote coordination centers and emergency departments. Ongoing evaluations already have demonstrated the usefulness of being able to move patients without having to take care of wires and being able to inspect bio-sensor data without being next to the patient.

However, new problems also have emerged when no wires connect a patient to a display, e.g., how do you know whose data you are looking at? And, when an alarm goes off because the bio-sensor data of a patient reaches a critical threshold, how do you find the patient?

In order to support medical responders on site and at coordination centers/emergency departments, the biosensor data is being supplemented with photographs and descriptions of the injury, injury mechanisms, and geographical position information.

Keywords: biosensors; disasters; information; technology; wireless
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Challenges of a Global Level Playing Field for Emergency Medical Systems Transport Safety—A System Safety Emergency?

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Introduction: Ambulance transport safety is a complex and multidisciplinary field involving acute and emergency healthcare delivery, automotive transportation safety, occupational health and safety, driver training, public health, and public safety. As such, it has been shown to be hazardous. This project's objective is to identify global spectrum in Emergency Medical Services (EMS) transportation safety systems standards.

Methods: A comparative analysis of general automotive, ambulance vehicle, driver training, and transport-related occupational safety standards for the US, Canada, Australia, UK, Sweden, Norway, and Germany was conducted by a multidisciplinary team.

Results: Non-EMS passenger vehicles had more stringent safety standards than did EMS vehicles in each region, except for Australia. EMS vehicle safety standards differed markedly across the nations (0–24 G testing requirements). Formal ambulance safety performance standards did not predate 1999.

Emergency Medical Services transport-related occupational safety standards ranged from no EMS standards in the US to the stringent standards in the European and Australian areas of scene visibility, vehicle interior and stretcher ergonomics, head protection, and protective clothing. Regarding driver training, the US ranged from nothing to a 2-day course and no specific licensure required; Australia, Canada, and the UK have structured, comprehensive driver training programs; Norway has a three-month driver training program with special licensure.

Conclusions: There is a large disparity in EMS transport safety standards globally. Emergency Medical Services transport system safety standards generally lag behind the principles of accepted automotive and occupational transportation safety. In a setting of well-described EMS safety hazards, the disparity between EMS safety and general automotive safety, and between occupational health and safety standards, is unacceptable.

Keywords: automotive safety; emergency medical services transportation; global standards; occupational safety
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Where is the "State of the Art"? New Initiatives and Innovations in Ambulance Transport Safety in the Developed and Developing Countries

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Emergency medical services transport safety bridges the disciplines of EMS health care, ergonomics, automotive safety engineering, occupational and systems safety, and public safety.

Globally, the nature of EMS systems is diverse. The spectrum of challenges includes limited funds or resources and hostile environments (urban congestion/violence, politics/warfare and treacherous geography). Also many safety initiatives never reach the published literature; rather, they are applied to a specific service or region, and quality assurance remains internal if evaluated at all.

This study identifies a spectrum of new initiatives that have been developed, or are being developed, to advance EMS transport safety, globally, over the past 5 years.

Emergeny Medical Services transportation safety initiatives were identified via a literature search, (engineering and medical), internet search engines and a multidisciplinary expert panel.

Automotive and transportation safety engineering, system design and policy initiatives were identified in both developed and under-developed worlds. Engineering approaches included: ambulance crash testing, occupant restraint and protective equipment design; new intelligent vehicle technologies (driver monitoring and feedback devices, vehicle-environment technologies) in both developed and under-developed worlds, and novel vehicle design initiatives. System design focus included a safety task force, a safety seminar development, risk benefit awareness, and new policies (revised ASA, CEN standards and KKK specifications and Z15 standard.)