Future Vision of EMS Delivery

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The National Public Safety Telecommunications Council is a federation of organizations whose mission is to improve public safety communications and interoperability through collaborative leadership.
Session Overview

• EMS Working Group
• History of EMS and Technology
• Unmanned Aerial Systems
• Nationwide Telemedicine Survey
• Summary
The EMS Working Group is a joint effort of the National Public Safety Telecommunications Council (NPSTC) and the National Association of State EMS Officials (NASEMSO).

There are 120 participants representing local, regional, and state EMS agencies as well as regulatory and medical control.

This year, EMS WG published a report on Public Safety Broadband Use by Rural EMS agencies.

The WG is currently working on a report regarding medical care sensors worn by the general public that can trigger an EMS response.

The WG also published a comprehensive report on prehospital use of video technology involving feedback from more than 670 EMS agencies.
History of EMS and the Role of Technology
Technology Enhances EMS Response

“I wonder….” Situational Awareness

“We wonder…” Common Operating Picture

Sequential Processing Parallel Processing

Inability to Adopt Available Diagnostic Applications
What EMS Needs For Data Management

• Network of Databases
  – Resource Status
  – Events Status
  – Adequate Bandwidth to Push/Pull/Park Data:
    • Voice
    • Other (Complex Biotelemetry, Video, Images)

• GIS (Visually) Based User Interfaces
  – Smartphone, Tablet, Laptop, Desktop
EMS Needs Advanced Technology

• Access to new, evolving technologies.
  – Multiple Patient Monitoring (Mass Casualty Incident).
  – Multiple Responder VS Monitoring.
EMS Needs Advanced Technology

• Two Way Telemedicine (Virtual MD/Community Paramedicine)
• Portable Ultra Sound (Video and Images)
EMS Needs Advanced Technology

• Rapidly Evolving Technology is bringing the future to the present.
  – Smaller, light weight devices
  – Improved battery life
  – Intelligent sensors and analytics
  – Enhanced video technology
  – Advent of cloud storage and computing
  – Implementation of regional healthcare and hospital data networks
Major Technology Improvements
Enhancing EMS

- First Responder Network Authority (FirstNet)
  - Created by Congress in 2012.
  - Funds the construction of a nationwide public safety broadband data network.
  - Will provide high speed voice, data and video services to law enforcement, fire, and EMS.
  - Services to be provided throughout the entire U.S. including rural areas.
  - Will enable a wide range of devices which will improve EMS response and patient care.
Major Technology Improvements
Enhancing EMS

• Next Generation 9-1-1 (NG911)
  – New IP data network to manage 9-1-1 calls.
  – Allows for voice, text messaging, and video chat between citizens and 9-1-1 centers, also known as Public Safety Answering Points (PSAPs).
  – Allows for sensors and machine to machine interfaces allowing devices to automatically generate a call for help.
  – Implementation is determined on a state by state basis.
The “Golden Hour” –
Time Dependent Life Threatening Conditions

≠ 20+30+50+40 Minutes

Trauma, Heart Attack, Stroke…..
New Technology Available Today:
Mobile Stroke Response – Field CT Imaging
Google Just Patented a Smart, Futuristic, Solar-Powered Contact Lens
Unmanned Aerial Systems (UAS) EMS Use Cases

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Unmanned Aerial Systems and EMS
UAS and Medication Delivery
The ambulance drone that could save your life: Flying defibrillator can reach speeds of 60mph

- $19,000 drone tracks emergency mobile calls and uses the GPS to navigate
- Operators can watch, talk and instruct those helping the victim by using an on-board camera
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EMS Telemedicine Survey

• What is Emergency Medical Services Telemedicine (EMST)?
  – Sending of video or pictures of patients, scene environment (e.g., crashed vehicle, home setting), specific injuries, or other physical assessment signs;
  – Two-way conferencing among field providers, patients, and medical control or consulting staff;
  – Sending of diagnostic still or video images (e.g., ultrasound, eye/ear/nose/throat scopes), electronic stethoscope sounds, and multi-vital sign monitoring devices); and
  – Remotely monitoring, and perhaps adjusting, home or other remote patient diagnostic and treatment devices.
EMS Telemedicine Survey

• **Overall Survey Results:** 77% of all respondents found video to be useful in these scenarios. The following are the percentage of respondents who found a useful application for each scenario:
  – Patient Refusal – Diabetic patient: 65.1%
  – Severe Injury – Motor vehicle trauma patient: 81.4%
  – Physician Assisted Patient Assessment – Stroke patient: 81%
  – Physician Assisted Patient Care – Pediatric asthma patient: 79.5%
  – Mass Casualty Incident – Multiple patients in single event: 76.5%
• Positive Benefits of Video Telemedicine:
  – Live video is needed for stroke assessment validation.
  – Best use for Community Para medicine - Mobile Integrated Health Care (CP-MIHC) and “gray zone” patient presentations.
  – Best use for patient refusals and risk management documentation.
  – Situational awareness from EMS to PSAP and ED.
  – Best use in rural areas with extended transport times and where EMS staff who do not have high-call volumes for skills maintenance.
  – Cameras create a more professional interaction (EMS crews and patients “behave” better).
EMS Telemedicine Survey - Feedback

• Negative aspects of Video Telemedicine:
  – **Time delay** for EMS to use the equipment (activation time, process time).
  – **Time needed** in ED to conduct video consultations (physicians are too busy).
  – **Big Brother** syndrome, surveillance, over reach by medical control.
  – Liability, Health Insurance Portability and Accountability Act (**HIPAA**).
  – **Cost** to purchase and maintain the system; cost to train personnel.
  – Will not improve medical care outcome (protocols handle all situations now)
EMS Telemedicine Survey

• Conclusions suggested by the findings of this report:
  – More work is needed to educate all EMS stakeholders on the capabilities of the FirstNet public safety broadband network.
  – Stakeholders in the EMS community need to better understand the capabilities of video systems, including their benefits and risks.
  – Pilot projects for EMST that use video need to be monitored to identify real world issues, best practices, issues, and errors.
  – Research is needed to determine quantitatively whether prehospital video systems positively impact patient outcomes.
Summary

• EMS and Evolving Technology:
  – EMS agencies will benefit from rapidly advancing technology.
  – Implementation of Next Generation 911 (NG911) and FirstNet will allow access to, and exchange of, large amounts of information.
  – Video will play a large role in the evolution of pre-arrival medical care and with EMS patient consultations.
  – Unmanned Aerial Systems (UAS) will become a “main stream” tool for public safety.
  – Research and Development will be critical to the successful creation, design and implementation of EMS technologies.
Reports Available on NPSTC Web Site

- Reports located on NPSTC website, www.npstc.org
  - EMS Telemedicine Report
  - Rural Considerations for EMS Use of Public Safety Broadband
  - EMS Applications for Public Safety Broadband
  - Unmanned Air Systems and Robotics – Guidelines for Creating a UAS Program
  - FirstNet Web Status Page
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