

JAC EMS/IP Excerpt - REPORT TO CONGRESS

The Joint Advisory Committee on Communications Capabilities of Emergency Medical and Public Health Care Facilities (Joint Advisory Committee) was established by the Chairman of the Federal Communications Commission and the Assistant Secretary for Communications and Information, U.S. Department of Commerce pursuant to the Implementing Recommendations of the 9/11 Commission Act of 2007. The Joint Advisory Committee's mission is to examine the communications capabilities and needs of emergency medical and public health care facilities.

The Committee released a Report to Congress dated February 4, 2008. The report details the status of communications systems for EMS and health care systems and possible technologies that may be utilized to advance beyond the current state of most communications.

Attached is an excerpt from the report, the section that illustrates the national needs for Emergency Medical Services and Public Safety.

The full report may be viewed at:

http://energycommerce.house.gov/Press_110/JAC.Report_FINAL%20Jan.3.2008.pdf

If you have additional questions, please do not hesitate to contact me at the number listed below.

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III. WHERE WE NEED TO BE -- A DIGITAL DIAGNOSIS

The full promise and potential of modern IT and enterprise Internet Protocol (IP) technologies have yet to reach health care and EMS. Information technology and IP-based networks are necessary elements of an adaptive, flexible, and responsive health system information communications network. Yet the health care sector is under-utilizing modern communication technologies; they are getting left behind, and the lack of IP-based networks and interoperable systems underlie this fundamental challenge.

Too often today, EMS responders, doctors and nurses must practice 21st century medicine with 20th century communications technology. The health care sector, which has yet to see the same productivity improvements that other sectors have seen from the move to online systems, still operates primarily with paper-based records – leaving the nation’s health care system strangled with high paperwork costs, administrative inefficiencies, cumbersome communications, and preventable medical errors.⁵⁰ If we are to unleash the full potential of our health and safety workers, then the information on a patient that resides inside a doctor's office must be capable of being sent across the network to hospitals, laboratories, specialists, insurers, and researchers. Enabling this transformation requires that patients, doctors, and administrators can manage their information securely and trust that sensitive medical information will be protected.

Like the arteries of a digital health care circulatory system, IP networks can pump live-saving information throughout the system and enable information flows to every extremity.

IP Networks are a basic building block of this digitally connected health care system. But to achieve their full potential, these IP networks must bridge all parts of the emergency communications chain – to create a seamless world of communications. Like the arteries of a digital health care circulatory system, IP networks can pump live-saving information throughout the system and enable information flows to every extremity.

⁵⁰ The Institute of Medicine estimates that between 44,000 and 98,000 Americans die each year from medical errors. Many more die or have permanent disability because of inappropriate treatments, mistreatments, or missed treatments in ambulatory settings. The current paper based system limits the ability to consolidate and distribute comprehensive patient information to those delivering care, and creates the potential of medical errors based on misinterpretation of patient details or delay in updating/relaying new information. See http://www.abovenet.com/newsandevents/events/docs/healthcare_webinar_abovenet_april17.pdf

1. THE EMERGING VISION OF IP'S POSSIBILITIES FOR EMERGENCY AND HEALTH CARE SYSTEMS COMMUNICATIONS

A. THE PROFOUND POTENTIAL OF AN INTEROPERABLE IP BASED EMERGENCY COMMUNICATION NETWORK OF NETWORKS.

With a commitment to planning, investment, and integration, IP networks can bring extraordinary improvements in communications. The potential for human benefit is profound. For example:

- **For 9-1-1 caller information.** Automatic crash notification technology could alert call-takers to a high-speed crash where the driver is incapacitated. A 9-1-1 caller could relay picture or video of an injured child taken at the scene with a cell phone.
- **For call-taker capability.** In a mass casualty event, or power or network failure, 9-1-1 calls can be received in overflow locations. Dispatchers can route patients to hospitals based on bed-availability.
- **For EMS patient monitoring.** Real-time biometry data and video enables monitoring of patients from the incident scene and on the way to the hospital utilizing a variety of telemetry tools. If a patient can't be moved immediately, remote consultation and diagnosis shortens the time to treatment, potentially saving lives and shortening recovery time.
- **For transport communications.** Cameras inside ambulances capture video of situations and patients to send to emergency room doctors for assessment, consultation, and preparation. As a result, an emergency room doctor's knowledge of the injury enables quicker and possibly more accurate treatment.
- **For emergency manager communications.** Emergency managers can more effectively respond to mass casualty events because event monitoring systems provide real-time maps showing 9-1-1 caller locations, available EMS resources, deployed resources, patient status, and disposition.
- **For doctor effectiveness.** Doctors are able to access electronic patient records (regardless of where those records are located), physician order entry systems (eliminating illegible handwriting that can lead to medical mistakes), and e-prescribing systems. As a result, doctors are able to avoid dangerous drug interactions by accessing the information about the drugs already prescribed.
- **For hospitals efficiency.** Hospitals are able to utilize a single network for voice, video, and data – delivering new capabilities, mobility, and savings. Hospitals could connect with remote experts who in an emergency provide surge capacity, remote patient monitoring, medical education and mentoring, and the delivery of basic health information.
- **For family pocketbooks.** By enabling broader health IT transformation and savings, the average family is projected to save thousands of dollars a year in health costs.

- **For remote patient monitoring and treatment.** At home, patients using broadband connections can check their pulse, screen their vision, monitor blood pressure, take their temperature, record glucose levels, and send this information in real-time to medical staff.
- **For outbreak detection.** Health officials could identify emerging health care trends or outbreaks sooner by monitoring, for example, types of medicines being prescribed, 9-1-1 call meta-data, or reported symptoms as people enter the health care system.
- **For life-saving research.** Researchers could sift through vast amounts of patient data to accelerate adoption of promising new treatments, or to spot dangerous drugs faster.
- **For triage center communications.** Hospitals that need to temporarily erect facilities for a triage staging area in an emergency could utilize wireless networks to establish remote communications and access all of their in-hospital application and services.
- **For communications providers.** Communications providers could manage networks to reduce costs, help eliminate single points of failure, extend capabilities, enable EMS, medical and public health to take advantage of private sector innovations, and ensure more robust communications in an emergency.
- **For statewide and regional system integration and coordination.** Emergency medical and health communications centers can integrate and coordinate the day-to-day needs of EMS, hospital, public health and related providers. These centers assure that appropriate resources are dispatched, that these responders are linked to medical overseers by the most expeditious means and to public health colleagues as needed for response and surveillance, and provide the ability to ramp up for major multiple casualty incidents.

B. EVER-GROWING RECOGNITION OF THE NEED TO MOVE TOWARD IP

Throughout EMS, medical, and public health facilities, there is a widely recognized need to extend communications capabilities beyond voice – to converge voice, video, and data and a plethora of applications using common networking technologies. Only then can communications systems used by emergency medical and public health care facilities be integrated with existing and future emergency communications networks.

By recognizing the power of IP-based communications technology – common in large and small businesses for improving communications and information sharing – EMS and public health entities can unite disparate users, adopt enhanced and secure applications that use open standards, and facilitate interoperability through a “network of networks” strategy.

There is growing agreement around this need, and a common vision is arising for the use of integrated IP networks.

- For public safety, for example, Silicon Flatirons has recommended the “development of a next generation network (“NGN”) for public safety ... [which] should be broadband,

Internet Protocol (IP)-based and capable of handling voice, data, image, video, and multi-media content.”⁵¹

- The FCC’s Network Reliability and Interoperability Council VII, Focus Group 1D, has recommended a “single, interconnected Internet Protocol system should be used for all emergency communications, connecting a wide variety of agency-run and public networks, both wireline and wireless.”⁵²
- For Hospitals, the Markle Foundation has recommended development of nationwide health information exchange built on common Internet protocol networks through a “Common Framework model ... [that] achieves a health information sharing environment with a decentralized “network of networks” approach based on common, open technical and policy standards and enforcement.”⁵³
- ComCare’s E-Safety vision is a “unified emergency Web services information architecture that ties together the various data systems used by law enforcement, fire, emergency management, public health, emergency medical, transportation, and homeland security and others” using Internet Protocol networks.⁵⁴

These progressive approaches need to be supported, linked and integrated. To make these visions a reality, hospitals and EMS providers need sufficient bandwidth – not just for day-to-day operations, but for surge capacity. These networks must be able to grow as technologies change, utilize common off-the-shelf technologies, and take advantage of the benefits that convergence brings.

⁵¹ Toward A Next Generation Network For Public Safety Communications, by Dale N. Hatfield and Philip J. Weiser, Silicon Flatirons Program, University of Colorado School of Law, May 17, 2007. At: http://www.silicon-flatirons.org/conferences/Hatfield_Weiser_PublicSafetyCommunications.pdf

⁵² http://www.nric.org/meetings/docs/meeting_20051216/FG1D_Dec%2005_Final%20Report.pdf

⁵³ The Connecting for Health Common Framework: Overview and Principles, Markle Foundation, <http://www.connectingforhealth.org/commonframework/docs/Overview.pdf>

⁵⁴ ComCare E-vision at: <http://www.comcare.org/ESafetyVision.html>

C. THE EMERGING VISION OF INTEROPERABLE IP-BASED NETWORKS FOR OUR EMS SYSTEMS.

The Advisory Committee set out to outline “where we need to be.” In an ideal world, EMS responders need to be able to connect anytime, from anywhere, with any device, regardless of the access method.

Below is the vision for where we need to head:

- ***Integrating and ensuring geographic interoperability with other public safety networks.*** Communications networks must be geographically integrated and based on functional needs enabling routine, reliable communications among EMS, fire, law enforcement, and other public safety agencies. Integrating EMS helps facilitate a more effective, coordinated, and cohesive response during both routine and large scale operations, and helps ensure optimal utilization of resources over large geographic regions.
- ***Ensuring wireless compatibility without gaps.*** Well-integrated radio, cellular, satellite, and other communications systems can provide robust, secure, and redundant service for both emergency and EMS-based community health service purposes.
- ***Integrating EMS with 9-1-1 dispatchers and calltakers.*** 9-1-1 calltakers and dispatchers must become an integrated node in an IP-based system of emergency broadband networks. Public safety answering points need the ability to integrate voice, caller geographic location, automatic vehicle location systems, vehicular automatic crash notification (ACN) systems, as well as user generated voice, text, and images into emergency response systems.
- ***Enabling EMS event monitoring systems.*** Every agency or facility with an EMS responsibility should be linked with an “EMS event and resource monitoring system”. These systems generally consist of a computer, mobile data unit (MDU), and/or personal data assistant (PDA) that enables access to overall data on activities in a general geographic area of responsibility. An icon on a map can mark all EMS and related resources including details about the availability of those resources. As soon as a PSAP enters information into a system, the screen can show the EMS dispatch by type (e.g. “cardiac.”) It enables easy one-stop access to real-time information on the type of call, patient(s) status, and disposition. Hospital staff, airmedical responders, and other EMS resources use the system to anticipate their involvement in an EMS event and/or to call in additional resources. It can be centrally coordinated by a regional or statewide emergency medical communications center.

- ***Enabling smarter decision-making in the field and better preparation at the receiving facility.*** Robust EMS communications systems can help make available on-line medical resources and enable transmission of relevant real-time patient data to a receiving medical facility. Such capabilities potentially allow medical decisions of greater complexity to be made in the field and permit a greater degree of preparation at the receiving facility – saving time, improving outcomes, and potentially saving lives.
- ***Developing patient records data earlier in the process.*** Communications systems enable data collection and facilitate commencement of patients’ medical records earlier in the course of their injuries/illnesses.
- ***Transmitting and receiving real-time patient data.*** Telemedicine and electronic patient monitoring and reporting technologies fully support emergency and EMS-based community health service operations.

Dispatching Digital Ambulances.

In Texas, they put their digital dreams on the road. The DREAMS (Disaster Relief and Emergency Medical Services) effort links medics in the field with doctors in the emergency room. This digital EMS system includes a high-tech interactive digital ambulance. The program develops and tests a variety of telemedicine and telecommunications technologies that feature real-time remote monitoring of patients who are in locations where hospital care is not readily available. These technologies are being designed to offer emergency medical care in rural areas, on the battlefield, and in disaster areas.

The program has resulted in numerous accomplishments, discoveries, and improvements. These digital ambulances – capable of communicating with voice, video, or text -- can deliver high-quality video and real-time patient data to the remote ER physician, greatly enhancing the physician's situational awareness in the ambulance to support the medical decision-making process. The ambulance hardware integrates communications systems with commercial, off-the-shelf medical and computer devices such as digital video cameras, GPS navigation systems, rugged laptops, signature pads, bar-code scanners, vital signs monitors, 12-lead EKGs, portable blood analyzers, ultrasounds and more. The system allows the ER physician to receive video, audio, real-time medical data, and text from the ambulance and transmit audio, text, and video annotations to the ambulance. The ER physician can remotely control the multiple video cameras in the ambulance to pan, tilt, or zoom to view the patient's injuries. With colored, on-screen markers, the physician can coach the EMTs through treatment that extends beyond normal EMS protocols. To make it all possible, they combine multiple low-bandwidth communications systems like cell phones, satellite phones, and data radios in order to produce enough bandwidth to send things like video.

D. THE EMERGING VISION OF INTEROPERABILITY IN OUR HEALTH CARE NETWORK.

America is still just in the beginning stages of an incredible IP revolution. Most experts believe we have seen only a fraction of its potential, and that the best is still ahead. On the horizon are a host of new data intensive network applications that can help make Americans more healthy, safe, and secure. Innovation in networking technology is essential to helping unlock these extraordinary new opportunities.

From prescriptions to medical histories and life-critical hospital charts, patient care today relies on an increasingly antiquated, costly, and error-prone system of pen-and-paper notations. The potential of information technology to reduce the number of medical errors, reduce costs, and improve patient care is enormous.

Some hospitals are striving to become largely paperless and filmless – by making patient records, lab results, clinical decision support, prescription systems, physician order entry, and health information exchanges accessible over the network. Radiology can complete a series of X-rays and make them immediately available to an entire team of orthopedic surgeons, instead of first waiting for the film to develop and then hand-delivering them to every necessary surgeon. It reduces paperwork bottlenecks, increases staff productivity, and helps cut down on the amount of time a patient generally waits for healthcare decisions.

There is broad national agreement that we need a national health information communications network. The JAC heard testimony from leaders of the successful Health Emergency Response Data System (HERDS) network, a New York based health information exchange application, recommending that we need a national health information communications network infrastructure – with a national plan, standardization, and a funding process.⁵⁵

E. UNIVERSAL BROADBAND'S ROLE IN THIS VISION FOR THE FUTURE.

Ensuring that every American has access to broadband service throughout the country is also an essential health care communications imperative. Broadband access can mean access to telemedicine applications, health information, and the ability of health care workers to work remotely in an emergency.

⁵⁵ Presenters included Mary Ellen Hennessy, Deputy Director, Division of Primary and Acute Care Services, New York State Department of Health and Ivan J. Gotham, Ph.D., Director, Bureau Healthcom Network Systems Management, New York State Department of Health, <http://www.fcc.gov/pshs/docs/advisory/jac/ppt/nysdoh102907.ppt>

Telemedicine and telehealth can:

- Extend the continuum of patient care beyond the “walls” of a hospital
- Make possible remote access to clinical services for patients
- Enable distance education, disease management, consumer outreach
- Provide significantly improved, cost-effective access to quality healthcare

Broadband also enables a host of remote patient monitoring technologies. Whether patient procrastination, age, isolation, or distance, sometimes patients do not stay in regular medical contact and do not seek appropriate medical care until there is a medical emergency. Innovative home health-care monitoring devices and systems now allow doctors to remotely monitor high-risk patients and their blood-pressure, pulse, and other measures over broadband. Progress can be monitored and intervention made before a medical crisis occurs. These technologies can avoid expensive house calls, provide real-time feedback, and allow resources to be focused on the most urgent cases. Some are even using video over broadband for regular video consults.

Telemedicine is not just about connecting health care to people at home. Every hospital, clinic, doctor’s office, and medical facility should have also affordable access to broadband. Broadband access can help level the playing field between urban and rural medical capabilities. With broadband, training becomes more accessible; second opinions don’t require long car trips for patients; and live-saving technologies can often be extended to wherever the patient may be located.

As FCC Chairman Kevin Martin correctly notes⁵⁶, *“In order to receive the benefits of telemedicine, electronic health care records, and other healthcare benefits, health providers must have access to underlying broadband infrastructure. Without this underlying infrastructure, efforts to implement these advances in health care cannot succeed.”*

2. THE NUTS AND BOLTS OF IP NETWORKS: UNDERSTANDING THE ATTRIBUTES AND PROMISE OF IP.

IP networks, common in Fortune 500 business, are essential for enabling a converged IP network of networks for emergency communications. JAC heard testimony from a number of witnesses who outlined some of the key benefits of integrating and utilizing IP-based communications systems. Compared to traditional analog voice communications systems, IP networks offer a number of inherent advantages and capabilities that are essential for improving both EMS and health care emergency communications.

⁵⁶ http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07-198A2.pdf