



National Public Safety Telecommunications Council

EMS Telemedicine Report

Prehospital Use of Video Technologies

Final Report

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1.0 Executive Summary

The emergency medical services (EMS) system has evolved from a “horizontal” taxicab (i.e., primarily fast transport) ambulance service before the early 1970s to the provider of lifesaving and emergency mitigating medical services it is today. That EMS system is now undergoing another transformation into a system with a new value proposition.¹ The new EMS features added service lines, bringing patient access to preventive and primary care services (“community paramedicine”) where gaps in such coverage exist. This new EMS value initiative will soon add the broadband capabilities of the First Responder Network Authority (FirstNet) to the mission critical voice service of its narrowband radios. This will enable robust data communications between all members of the EMS team in the field and in facilities and the use of sophisticated diagnostic, treatment and remote medical consultation devices for emergency, non-emergency transport, and community paramedicine care.

Emergency medical services telemedicine (EMST) can include:

- 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.

Does the ability to use EMST add value to the new EMS?

This report describes an effort to assess this question. It is based on the results of a comprehensive nationwide questionnaire involving more than 670² respondents representing prehospital EMS providers, hospital emergency department directors, trauma center directors, EMS medical directors, and online EMS medical control physicians. While 77% of all respondents favored the use of EMST over a series of patient care scenarios, this report identifies a number of important issues and barriers that must be addressed.

¹ From: “*Realizing the Value of EMS in Our Nation’s Health Care Transformation*” report by the National Association of State EMS Officials (NASEMSO) and four other national EMS associations.

²² 679 total responses were received which included 9 duplicate or corrupt records, yielding 670 unique responses. The questionnaire response software included all 679 responses in the calculations found in Appendix A, which introduces an error of only 1.3% isolated to only those answers in the Appendix. Percentages and totals reported in the main body of the report are based on the 670 unique responses.

Public safety agencies, including EMS organizations, are implementing new technology solutions to supplement and enhance emergency response. The adoption of these systems is occurring more rapidly in the EMS environment because rapidly evolving in-hospital technology solutions are frequently considered for EMS field use. Patient care vital signs telemetry and other data centric platforms are increasingly important. The adoption of first responder video systems, including vehicle-based and body worn cameras to improve officer safety and increase accountability, has increased dramatically in recent years. Video represents just one of the EMST technology solutions that are being piloted to extend and enhance patient care.

The announcement by FirstNet that it is building a Nationwide Public Safety Broadband Network (NPSBN) has energized many EMS stakeholders. The ability to leverage a high-speed data network dedicated to first responders will be transformational in many areas including patient care and program management.

While hospitals have been using fiber-based video telemedicine for some time, EMS agencies are only now starting to study the issue. It is speculated that wireless EMST may similarly bring specialized diagnostic capabilities from where they abound in specialty centers and other medical facilities to field providers whose experience and/or training may not afford the accurate interpretation of certain signs and symptoms (e.g., in stroke) or interpretation of certain device output (e.g., portable ultrasound). By contrast, in these considerations, it is speculated that when the field provider is highly trained and experienced (a full-time urban paramedic, for instance), EMST may offer less added value if not negative value.

In addressing the questions related to, “Does the ability to use EMST add value to new EMS?” 670 responses were received. Of these, by EMS system role:

- The majority were from prehospital EMS providers (n=483, 72%),
- EMS medical directors generated 113 responses (16.9%),
- Online EMS medical control physicians generated nine responses (1.3 %),
- Hospital emergency department /trauma center directors generated an additional 50 responses (7.5%), and
- Fifteen respondents (2.2%) were categorized as “other,” which included emergency management professionals, managers of public safety answering points (PSAPs), and some industry representatives.

Two additional sets of questions further assessed whether EMST video adds value to EMS:

- **Role-specific value** of certain video applications, and
- **Scenario-specific value** of certain video applications.

Both used a mix of multiple choice and open-ended questions, and respondents were encouraged to provide free text comments and opinions on each of the questionnaire elements.

In the **role-specific value segment**, respondents were asked to pick video applications they thought would be useful for online EMS medical control physicians, hospital emergency department and trauma center staffs, and prehospital EMS providers.

Of nine possible EMST video applications, the following were picked by the greatest percentages of all respondents as being the most useful for online EMS medical control physicians:

- Physician assisted critical care (64%)
- Risk management/mitigation – Patient refusal scenarios (60.5%)
- Improved decision support/community P\paramedicine (57.3%)

Of eight possible EMST video applications, the following were picked by the greatest percentages of all respondents as being useful for emergency department/trauma center staff:

- Greater awareness of incoming critical care patients (67%)
- Improved patient care from visualization of scene/mechanism of injury (60.5%)
- Enhanced decision making, trauma and stroke team activation (59.9%)

Of 11 possible EMST video applications, the following were picked by the greatest percentages all respondents as being useful for prehospital EMS staff:

- Risk management on patient refusals (68.6%)
- Risk management, unruly patient behavior (67.7%)
- Additional training component (64.4%)
- Quality assurance/post-incident analysis (61.4%)

The **scenario-specific value segment** of the questionnaire presented five patient care scenarios and asked the respondents to indicate if one of the following EMST video applications would be helpful:

- Live video consultation by medical control with patient
- Live video consultation by medical control with paramedic
- Picture image of patient transmitted to medical control
- Video clip of patient to be transmitted later or shown upon arrival at Emergency Department (ED)
- No video or picture technology is needed for this case

- No opinion

Overall, 77% of all respondents identified beneficial uses over 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%

Free text comments made by respondents fell into two extreme categories. Feedback either greatly favored the adoption of video solutions by EMS or felt that it was a very bad and untested idea. Opinions were generally at either end of the spectrum and rarely portrayed a middle ground.

The following general impressions are based on a review of the comments filed by all 670 questionnaire respondents:

Positive Benefits of Video Telemedicine:

- ✓ Live video is needed for stroke assessment validation/enhancement
- ✓ Best use for Community Paramedicine- 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 will be enhanced
- ✓ 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)

Negative aspects of Video Telemedicine:

- χ Time delay for EMS to use the equipment (activation time, process time)
- χ Time needed in ED to conduct video consultations (physicians are too busy)
- χ Big Brother syndrome, surveillance, over reach by medical control
- χ Liability, Health Insurance Portability and Accountability Act (HIPPA)
- χ Cost to purchase and maintain the system; cost to train personnel
- χ Will not improve medical care outcome (protocols handle all situations now)

The following are 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.

2.0 About NPSTC

The National Public Safety Telecommunications Council is a federation of public safety organizations whose mission is to improve public safety communications and interoperability through collaborative leadership. NPSTC pursues the role of resource and advocate for public safety organizations in the United States on matters relating to public safety telecommunications. NPSTC explores technologies and policy involving public safety telecommunications, analyzes the ramifications of particular issues and submits comments to governmental bodies with the objective of furthering public safety telecommunications worldwide. NPSTC serves as a standing forum for the exchange of ideas and information for effective public safety telecommunications.

The following 16 organizations comprise the NPSTC Governing Board:

- American Association of State Highway and Transportation Officials
- American Radio Relay League
- Association of Fish and Wildlife Agencies
- Association of Public-Safety Communications Officials-International
- Forestry Conservation Communications Association
- International Association of Chiefs of Police
- International Association of Emergency Managers
- International Association of Fire Chiefs
- International Municipal Signal Association
- National Association of State Chief Information Officers
- National Association of State Emergency Medical Services Officials
- National Association of State Foresters
- National Association of State Technology Directors
- National Council of Statewide Interoperability Coordinators

National Emergency Number Association
National Sheriffs' Association

Several federal agencies are liaison members of NPSTC. These include the Department of Homeland Security (the Federal Emergency Management Agency, the Office of Emergency Communications, the Office for Interoperability and Compatibility, and the SAFECOM Program); Department of Commerce (National Telecommunications and Information Administration); Department of the Interior; and the Department of Justice (National Institute of Justice, CommTech Program). In addition, Public Safety Europe is also a liaison member. NPSTC has relationships with associate members, the Canadian Interoperability Technology Interest Group and the Utilities Telecom Council, and affiliate members the Alliance for Telecommunications Industry Solutions, Open Mobile Alliance, Telecommunications Industry Association, and TETRA Critical Communications Association.

NPSTC's EMS Working Group is comprised of approximately 80 participants who represent a broad cross section of the nation's EMS systems. Representatives include private EMS organizations as well as fire-based and third service entities. EMTs, paramedics, medical directors, and EMS system administrators contribute to the group and represent urban, suburban, and rural areas. The EMS Working Group undertook a study of telemedicine and reviewed expected advances in broadband communications that would support new technologies, including prehospital video.

3.0 Report Overview

The new NPSBN, called FirstNet,³ will allow EMTs, paramedics, and other first responders to access a dedicated high-speed wireless data network. This new network will allow mobile telemedicine, in the form of secure, live video, pictures, text, and patient data, including:

- Live video consultation between EMS dispatch centers, field personnel, and health care providers. Transmission of stored video clips or images will be possible between all segments of the healthcare community.
- Vital signs telemetry, including blood pressure, pulse rate, pulse oximetry, end tidal CO₂, and other parameters may be shared with receiving physicians, hospitals, and trauma centers.
- Transmission of 12-lead EKG and other diagnostic data including ultrasound images to receiving hospitals and medical control consoles.

³ See www.FirstNet.gov for more information.

- Automated crash telemetry sensor data providing vehicle impact information (front or side impact, roll over, final resting position), number of occupants in the vehicle, air bag deployment, and crash severity analysis.
- Machine to Machine (M2M) data exchanges where analytics are used to interpret the patient's condition and recommend (or carry out) a response such as resetting a cardiac pacemaker or initiating auto administration of medication.
- Access to remote databases for clinical consultation or to review a patient's medical record.

Telemedicine, according to the U.S. Department of Commerce, is a broad term for electronically transmitting medical information to sustain or improve a patient's health. Also called telehealth or mHealth, particularly when referring to applications that enable consumers to monitor their own health, telemedicine may include:

- Sharing documents, test results, images, and other written or visual data between clinicians in various locations, or between patients and clinicians.
- Remote monitoring of a patient's vital signs.
- Secure, HIPAA-compliant messaging, such as texts or other multimedia alerts.
- The ability for healthcare providers to observe, diagnose, and recommend treatment via video clips or live streaming video.

For over a decade, healthcare leaders have touted the potential of telemedicine to expand access to healthcare; lower costs through enhanced efficiency, better preventive care, and improved care quality; and improve patient outcomes.

This report examines multiple operational use cases for prehospital telemedicine. This includes the ability to send live video and picture images as well as share stored video clips and images. While video conferencing and mobile multi-media messaging technology is advancing quickly, there is no consensus in the health care community on how it should be used prehospital. For example, is there a benefit in having a paramedic stream live video of a stroke assessment to the ED, should a video clip shown upon arrival at the ED, or is the current voice radio report sufficient?

Would video assist the medical control physician in developing a better awareness of the overall patient condition or would it be distracting to EMS field personnel and the patient? Would pictures or a video clip showing an entrapped patient help the trauma team better prepare for the patient's arrival? Would EMS system medical directors or online medical direction physicians prefer to visualize and interact with a diabetic patient in their home before authorizing an EMS crew to transport the patient to an alternate destination other than the ED?

What research has been done to quantify enhanced patient care outcomes with this technology?

A nationwide questionnaire was the first step to determine how video and images might be used in the prehospital patient care setting. Face-to-face interviews with ED administrators, EMS medical directors, and EMS system executives were also conducted to extract more detailed thoughts and opinions.

Video technology is rapidly evolving with new features and functionality, better compression and image stabilization, and falling purchase and use costs. Commercial and home use of video systems has exploded in popularity over the past 5 years. Video feeds to citizen cell phones allow a homeowner to see who is at their front door, monitor the arrival of their children coming home from school, and keep an eye on the baby sitter.

Video is also increasingly present in the hospital environment where long distance telemedicine sessions are linking rural hospitals with tertiary facilities hundreds of miles away. Tele-radiology allows the sharing of x-ray, MRI, and CT scans with specialist physicians who can provide rapid interpretation. Tele-presence video allows a remote specialist physician to interact directly with the patient in the emergency department.

Thousands of law enforcement body camera systems are being purchased to enhance police accountability and to gather additional information at the scene of incidents. There is a national debate over how these systems should be used, how citizen privacy can be assured, how long video data should be stored, and how the public can access the video content. Most of these issues will also be faced by the EMS community.

Planning for Next Generation 911 (NG911) systems is currently underway across the U.S. The NG911 system will provide data connectivity between emergency callers and the Public Safety Answering Point (PSAP) which will enable sharing of non-voice information including video and images. This will allow EMS agencies to interact with 911 callers in new ways and may change many prehospital care protocols used by dispatchers. Advanced automated crash notification, like that provided by OnStar is but one type of Machine to Machine (M2M) data input that may flow to the PSAP, be automatically or manually analyzed, and then cause a dispatch data burst through the FirstNet network to the responder's device.

Leveraging all of this new technology could allow the ED physician to visualize a stroke or seizure patient's medical presentation at the time of the 911 call and compare it with the paramedic's on scene assessment to determine the rate and degree of the medical emergency progression.

This report seeks to identify specific uses for video telemedicine and to determine the next steps in evaluating telemedicine programs.

4.0 EMS Agency Operations

EMS systems come in all shapes and sizes and there is great diversity in how agencies manage their response to patient care incidents. Each EMS agency may be defined by their organizational structure, geography served, service level, and a host of other factors. **It is important to understand these dynamics when considering the impact of EMS video telemedicine.**

Organizational Type

EMS agencies may be operated as public entities operated by a unit of local government, as a private not-for-profit, or a for-profit corporation. They may be associated with a fire service or law enforcement agency, operated as an independent third service, or organized as a function of a private service or system such as a hospital.

Geography

EMS agencies are tailored to support the topographic and population density characteristics of their service area geography. Organizations may cover urban, suburban, or rural areas or be responsible for a combination of all three. Service areas may have mountains, bodies of water, and other impediments to access. The density and spread of the population and the topographic features of the land combine to impact EMS response and clinical operations. Urban area EMS agencies may receive an EMS event call soon after it happens (e.g., a car crash), only need 10 minutes to respond to the scene, and another 10 to transport a patient to the ED. A car crash in a rural area may not even be discovered for an extended period of time with additional delays in determining the exact location and severity of the injuries. Additional time is lost while appropriate resources are dispatched and can respond to the scene, treat, stabilize, and transport of the patient(s) to the hospital. Together, these may add to hours to the eventual arrival of the patient at the receiving hospital.

Service Level

EMS organizations may provide Basic Life Support (BLS) using Emergency Medical Technicians (EMTs) who provide emergency care including bleeding control, basic airway support, oxygen delivery, and patient stabilization. EMTs may also operate automatic external defibrillators (AEDs) and, in some systems, are able to start intravenous lines.

EMS organizations may also provide Advanced Life Support (ALS) using paramedics who provide a higher level of care including interpretation of the patient's heart rhythm, administration of drugs, complex airway support, and other therapies.

Some EMS agencies are also engaging in CP-MIHC programs where their personnel take on a greater role in managing patients with chronic conditions or those just released from the hospital. This program is covered in great detail at the end of this section.

Response Configuration

EMS organizations may provide patient transport and/or provide first response services which are designed to reach the patient rapidly and provide stabilizing care while awaiting the arrival of the transport ambulance. These services may also be provided at the BLS or ALS level or a combination of the both.

Many EMS systems incorporate medical severity screening questions used by specially trained telecommunicators. Answers to these questions, such as, "Is the patient awake?", trigger a tiered response that is medically appropriate for the patient's perceived condition. These systems, also called Medical Priority Screening, can conserve EMS resources and ensure that patients who are the most likely to need advanced care receive a paramedic response.

Staffing

EMS agencies may use an all career (paid) staffing model or they may rely entirely on a volunteer staff of trained personnel. Other agencies use a combined model that includes paid and volunteer providers. In some agencies, EMS personnel are on duty and immediately available to respond. In other organizations, EMS personnel are "on call" while at work or at home and respond as quickly as possible. In some systems, typically serving rural areas, EMS personnel are neither on-duty nor on-call. In these systems, also called "best effort" EMS, any available personnel will respond to the incident.

Medical Control

Patient care aspects of EMS systems are generally directed by a physician medical director as an extension of his/her license. There are a variety of online and off line medical control configurations used by EMS agencies.

In some systems, EMS personnel operate exclusively from a set of physician approved "standing orders" which allow them to assess and treat most medical conditions ("off-line medical direction"). EMS personnel may occasionally contact a physician by radio or phone to receive assistance on complicated or unusual cases ("online" medical control). In other systems, EMS personnel must contact their online medical control physician in almost all cases to confirm patient care decisions. Medical control activities may be managed by the physician in the

receiving hospital's ED; by a designated set of ED physicians handling all EMS calls regardless of patient destination; or by a dedicated physician who is not in the ED. Typically, online medical control communications are recorded for quality and medical–legal purposes. Recording is often done at the hospital, but may occur at a communications or dispatch center. Storage requirements for recordings vary wildly from none to up to 18years for the case of pediatric patients.

Aeromedical EMS

Specialized EMS organizations provide aeromedical transportation including the use of helicopters and fixed wing aircraft. These systems respond directly to the scene of the medical or trauma emergency or provide inter-facility transfer. Many of the patients transported via air require critical care and advanced medical procedures. These can include neonatal and pediatric cases, patients on balloon pumps receiving ECMO,⁴ and adult critical care involving burns, trauma, stroke, and cardiac emergencies. Aeromedical EMS units are typically staffed with personnel who have advanced training and are considered experts in their field. However, they are managing the most critically ill and injured patients with extended transport times. Some systems are currently using video chat programs to allow consultation with specialty physicians during pediatric and neonatal transports. These programs have unique telemedicine needs, including:

- The need to receive a data message from the dispatch center managing the emergency call, to include location information, GPS coordinates, incident details, and units on scene.
- The need to receive video from the scene of the emergency to verify landing zones and hazards.
- The need to receive and exchange patient care information from on scene EMS units and sending and receiving hospitals.
- The need to send location data and other telemetry from the aircraft to the dispatch center for operational tracking and crew safety.
- The need to send video and patient telemetry from the aircraft to the designated medical control physician as well as the receiving hospital.

Community Paramedicine

Community paramedicine⁵(CP)– and a related concept, mobile integrated healthcare (MIH or MICH) is changing the face of EMS and placing EMTs and paramedics into a new environment. EMS agencies will likely evolve to provide some or all of the following services:

⁴ Extracorporeal membrane oxygenation treatment requiring highly specialized medical technology.

⁵ From “*Realizing the Value of EMS in Our Nation’s Health Care Transformation*” report by the National Association of State EMS Officials (NASEMSO) and four other national EMS associations.

- Urgent medical assessment and care.
- Preventive medical assessment and care.
- Chronic disease assessment and management support.
- Post-discharge follow-up assessment and management support and/or
- Based on the assessments described above, patient transport, arranged transportation, or referral to other community health and social service resources.

This evolution is logical because of the existing strengths inherent in the nationwide EMS structure:

- EMS is already in virtually every community.
- EMS is fully mobile and able to address patient needs 24 hours a day, 7 days a week, and 365 days a year.
- EMS is an expected, respected, and welcomed source of medical assessment and care in people's homes and elsewhere in the community.
- EMS provides highly reliable patient assessment and intervention during calls to 911 and in response to emergency, urgent, or unscheduled episodes of illness or injury.
- EMS, through its multiple service lines, can effectively navigate patients needing urgent or unscheduled care through the health care system to ensure they receive the right care, in the right place, at the right time.
- Through its 24/7/365 health care safety net, EMS CP-MIHC services are able to fill gaps in patient care identified by its providers and by others in the community's health care network. EMS can prevent new or recurrent medical episodes through these services. This reduces the incidence of ambulance transports, emergency department visits, hospital admissions and readmissions, preserving medical resources and reducing costs.
- Patient management routinely requires consultation with a physician or other advanced practice provider. Video consultation between EMS CP personnel and physicians to enhance home care is being tested in several regions of the U.S.

This expansion of the EMS system role is still being defined and has implications for training and scope of practice. As of the end of 2014, more than 100 EMS agencies, often in collaboration with hospitals, had a CP or MIHC program, according to a survey issued by the National Association of Emergency Medical Technicians (NAEMT).

The broad array of EMS system configuration, staffing, and response options clearly indicate that any technology program, including video telemedicine, must be tailored to meet the unique operational requirements of the agency. **A "one size fits all" video program is unlikely to meet the needs of most EMS organizations.**

5.0 Video Trends, Issues, and Concerns

Video systems and the use of video conferencing solutions are becoming more commonplace across the U.S. Banks, retail establishments, and other companies are using virtual presence devices to provide customer service. The Hertz Rental Car facility at the Denver International Airport has ten “virtual assistance” kiosks where customers can instantly interact with a live agent via video chat on a large screen.

Health insurance companies are now offering video consultation services linking their patients with physicians paid by the insurance provider to provide routine and urgent care while reducing their cost.

EMS agencies have used in-vehicle video systems to monitor driver performance and reduce their risk management exposure. Some agencies are exploring the use of video for medical care quality assurance purposes and to document patient refusal cases.

More extensive use of prehospital video, including video streaming of patient care activities is still being assessed. There are a number of extremely complex policy and governance issues that must be addressed by EMS agencies contemplating a video telemedicine program. Many of these are similar to those being faced by law enforcement agencies today.

Video Use Policy

When should a paramedic’s body camera be turned on? Should it run all the time as some law enforcement agencies require or only during a patient encounter? Should it only be activated for predefined medical and trauma events or can the paramedic use discretion to turn the camera on or off? If a patient or family member objects to the use of a camera, is the recording stopped? Should the paramedic’s camera be turned off when entering the hospital emergency department?

Impact of Public Disclosure Laws

Guarding the privacy of persons who are deliberately or accidentally caught in the video record should be a high priority. Each state sets statutory guidance on this subject and there is a wide array of legislation that ranges from significant restrictions on video release to near full public access to all video records.

Many agencies mistakenly believe that HIPAA will automatically restrict the release of all EMS-generated video. While video involving patient care will likely be covered by a privacy

exemption,⁶ there are many other cases where EMS may have to release video. These include video of accident scenes where the paramedic interviews the occupants of the vehicles and determines there are no patients. Deceased victims are not “patients” and would not be covered by HIPAA. Finally, family members and others who happen to be in the frame of the video camera would not be covered by a HIPAA patient privacy exemption. It should also be noted that law enforcement agencies are not bound by HIPAA and the police officer’s body camera may also record patient interactions if they are present on the EMS scene.

Managing the Release of Video Records

The release of a video record typically requires significant technical and personnel resources. An authorized agency employee must review the video file to determine what content must be redacted from the video. Currently, video redaction processes require significant manual intervention to target the elements of the video that must be pixelated or covered. It is also important to examine the meta data files that are embedded with the video which include audio and location data. This information may be isolated and removed as necessary to comply with applicable state law.

Storage of Video Records

Storage of video files represents a technical challenge. How long should EMS video files be maintained, if at all? Are they subject to the same state patient record maintenance requirements? Should the video be maintained in its original file condition (potentially high-resolution imagery) or should it be compressed for more efficient storage? Should storage of video files occur at the local agency level or should they be stored in the cloud using a commercial service?

The EMS agency, hospital, or medical control facility may be the “owner” of the video and therefore the responsible custodian. What requirements do hospitals have if they receive the video and incorporate it into a patient care record? Are they merely consumers of video data or do they also become custodians?

Security and Access to Video Files

EMS video system design must consider end-to-end encryption methodologies to prevent unauthorized access to the video content. Agency policy must provide direction on who has access to the video records stored on local devices or in the main video repository. The use of credentialing and passwords are necessary components of EMS video management.

⁶ Cornell Law briefing on HIPAA <https://www.law.cornell.edu/cfr/text/45/164.501>

The perception of the video program by the EMS community (including EMS agency employees, hospital, and medical director staff) and the general public must be considered. Video programs must have clearly articulated purposes and agencies should disclose how video may be used for non-patient care documentation. For example, if video is a component of a quality assurance program, can that video evidence become a part of a disciplinary process against an employee? When a paramedic wheels a patient into a hospital emergency department, what assurances are there that the lapel camera is not recording the scene in the ED? Patients and other EMS consumers (e.g., nursing homes, urgent care centers) also need to understand how the video program will work before an EMS crew arrives at their facility with a camera running.

6.0 EMST Video

In spite of numerous policy, governance, and technical issues the use of prehospital video seems poised to advance EMS care.

Use of video by EMS is in early stages of adoption. A few companies are marketing video consultation equipment designed for use in the field and there are an ever increasing number of vendors who are building fixed and body worn camera devices.

Video and image systems can be divided into several categories based on their potential use to support clinical care:

- Live video: A video stream is sent from the field to the receiving console, usually located in a hospital emergency department or medical control unit.
- Video Clip: A video clip is recorded by field personnel and either transmitted to the receiving console at a later time (e.g., during transport) or is replayed for the physician upon arrival at the hospital.
- Still Image: A picture of an incident scene or patient is taken by field personnel and either transmitted to the receiving console immediately, at a later time, or upon arrival at the hospital.

Each of these approaches has different benefits and issues that must be addressed. For instance, live video requires that a physician be available at the moment the content is delivered to the console while a video clip can be viewed later and more easily shared with others (e.g., distributed to on-call personnel who are on a stroke response team). Live video may or may not be stored for use in patient care reporting systems or for later review.

Several EMS and hospital systems are running pilot projects to test the use of video in specific clinical care scenarios. Two of those programs are discussed here. The first involves the City of

Houston Fire Department using video at the scene of an incident to better manage non-emergency patients. The second program involves the Cleveland Clinic and their telestroke network which provides video consultation to the referring hospital and throughout transport of the patient to the tertiary care facility.

City of Houston ETHAN Program: Video Telemedicine Pilot Project

The City of Houston Fire Department (HFD) recently completed a pilot project that allowed paramedics to engage in real time video consultation with a dedicated medical control physician.⁷ The project is called ETHAN for (Emergency TeleHealth and Navigation) and was funded by the State of Texas using an “1115 Waiver” which allowed the use of CMS⁸ funds for the pilot project.⁹ The Houston EMS system provides service to more than 2.1 million residents and 40 hospitals receive more than 300 patient transports each day. Like many EMS systems, HFD only transports half of the patients they encounter following a 911 call for service.

This pilot project was designed to improve the utilization of EMS services, to divert medically appropriate patients away from hospital emergency departments, and to provide a follow-up program to ensure that at-risk patients successfully entered the health care system. Houston Fire had previously used a nurse screening program to validate EMS response and later used paramedics to question 911 callers to determine the appropriate EMS response. In order to eliminate delays in dispatching EMS resources, the program was modified to allow paramedics to contact medical control after arrival with the patient. Minimal triage of the EMS request is now done by the dispatch center.

The ETHAN program is the latest iteration of the project and uses emergency department physicians and a video chat program linking the physician, paramedic, and patient. The project operated 7 days a week on a variable schedule that matched periods of EMS system high utilization. EMS units were equipped with Panasonic G1 Touchpad computers with built in cameras. This is the same device EMS crews were using to complete patient care reports. Paramedics evaluated the patient and then contacted the base station physician if the situation met certain criteria for a possible ER diversion. The physician could engage with the paramedic via video chat and also talk directly to the patient and family members. This program was based on a similar concept used by U.S. military forces in Afghanistan in which video telemedicine was used to determine transport methods from the field to the hospital.

Early feedback from the program included the following observations:

⁷ Interview with Dr. David Persse, City of Houston Fire Department, EMS Physician Director.

⁸ Centers for Medicare and Medicaid Services.

⁹ The pilot project started operation in December of 2014 and was completed in October 2015.

- Initial connectivity problems with the video chat program were resolved.
- The camera lens on the EMS device needs to be cleaned to provide a clear video image.
- Training of the EMS crews on use of the equipment was relatively easy.
- The patient/physician video interaction frequently revealed additional medical history information the patient had not offered to the paramedics.

A June 2015 project summary report indicated increasing adoption of the program by field personnel. Only 20% of the ETHAN patients were transported to the ED by EMS. Fifty percent took a cab to the ED, and the remaining patients were referred to a health care clinic (14%) or their primary physician or other care provider (16%). The majority of the patients encountered during the program were covered by insurance and had resources necessary to manage their problem. Only 20% of the overall patient population was considered homeless.

A full report on the ETHAN program is provided in **Appendix E**.

Cleveland Clinic Telestroke Network; Specialty Response Units

One area where video telemedicine has been deemed beneficial is during the initial assessment of a patient suffering a stroke. The “Target Stroke” program, sponsored by the American Heart Association and American Stroke Association, focuses the EMS and health care system to provide a rapid response, assessment, and transportation to an appropriate treatment facility.

The Cleveland Clinic operates a telestroke network¹⁰ serving 11 hospitals in Ohio and Pennsylvania providing rapid exchange of patient information and radiology data. In 2014, they launched a mobile stroke unit which can transmit live video and telemetry, including a patient’s CT brain scan, to its main campus for review by specialty physicians. Video consultation technology allows interaction with the patient and critical care team members during the transport phase. The mobile stroke unit supplements the virtual telepresence of the neurologist or neurosurgeon who interacts with the patient and ED staff at the transferring hospital.

These programs represent just two components of EMS telemedicine video. There are potentially dozens of ways in which video may be incorporated into EMS response, patient care, quality assurance/quality improvement, and administrative/risk management areas. In order to assess the potential use of video, the EMS Working Group realized they needed to solicit input from a broad range of EMS system components and stakeholders.

¹⁰ <http://www.unionhospital.org/news-and-announcements/18/world-class-stroke-care-comes-to-uh>

7.0 Nationwide EMS Telemedicine Video Questionnaire

In order to fully understand the potential impact of EMS telemedicine a decision was made to solicit input from EMS agencies, hospitals, and medical control physicians on a range of video issues and case presentations.

7.1 Questionnaire process

The questionnaire was designed over the course of several weeks and involved input from EMS agencies, industry partners, and other stakeholders. The questionnaire included two main components covering potential uses for video and how video use might apply in specific patient care scenarios. It included a mix of forced choice and open-end questions and respondents were encouraged to provide free text comments and opinions on each of the questionnaire elements.

The introduction section of the questionnaire asked for basic demographic information:

- Type of respondent (EMS, hospital, medical director)
- Population served by EMS organization or hospital
- Square miles of service area
- Typical transport times from scene to hospital

This demographic information allowed the questionnaire results to be parsed out to determine differences in opinion between the various stakeholder groups.

In the first section, respondents were asked to rank the potential effectiveness of video. The questionnaire provided a list of video capabilities specific to EMS operations, hospital emergency departments, and trauma centers, and EMS system medical directors and medical control physicians.

Example of video use options by category:

- Medical Control: Better decisionmaking/risk mitigation on patient refusal request
- Hospital ED: Enhanced decisionmaking on when to activate special teams (trauma team/stroke team/stemi team).
- EMS System: Enhanced crew safety

The questionnaire allowed all respondents (regardless of professional discipline) to weigh in on how they felt video would assist each of the three areas. This allowed the questionnaire to capture how medical directors and hospitals thought EMS should use video and how EMS felt hospitals and medical control physicians should use video.

The second section of the questionnaire presented five patient care scenarios and asked the respondents to indicate if video use would be helpful.

1. Patient Refusal - Diabetic Patient: This scenario describes the response to an unconscious diabetic patient who is resuscitated with IV glucose and is now awake refusing further treatment and transport. The EMS crew is consulting with their medical control physician.

2. Severe Injury – Motor Vehicle Trauma Patient: This case involves a vehicle crash with an adult patient who has low blood pressure and abdominal pain and is being packaged for transport to a trauma center.

3. Physician Assisted Patient Assessment – Stroke Patient: This incident involves a semi-conscious patient who is reported to have stroke like symptoms. The EMS crew is consulting their medical control physician to determine if they should transport to the closest community hospital or a more distant stroke certified treatment center.

4. Physician Assisted Patient Care – Pediatric Asthma Patient: This case involves a pediatric asthma patient in a rural area with an extended EMS transport time to the hospital. The patient's condition is deteriorating and the paramedic is seeking advice from the medical control physician.

5. Mass Casualty Incident – Multiple Patients in Single Event: This incident involves a school bus crash with multiple patients. A paramedic supervisor is communicating with medical control and the trauma center regarding the number of patients and their severity.

In each case the respondent was asked to pick the statement that reflected the best use of video technology for the particular patient presentation. There were six options available to evaluate each case:

1. Live video consultation by medical control with patient.
2. Live video consultation by medical control with paramedic.
3. Picture image of patient transmitted to medical control.
4. Video clip of patient to be transmitted later or shown upon arrival at ED.
5. No video or picture technology is needed for this case.
6. No opinion.

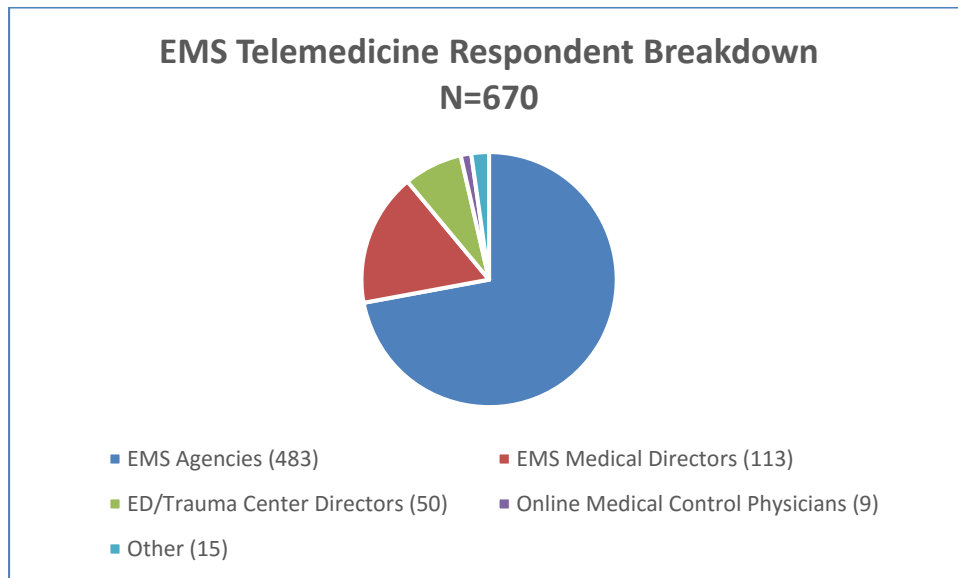
Each question provided a space for the respondent to enter text comments allowing them to enhance their response or provide additional information. At the end of the

questionnaire a general free form question was provided to allow each respondent to provide any additional thoughts or opinions of EMS video.

The questions were then entered into the Constant Contact questionnaire system used by NPSTC and distributed broadly through various social media channels. NPSTC staff compiled the questionnaire results and removed duplicate and incomplete records. An analysis was also performed to verify that the respondents' job title matched the professional discipline they selected in the questionnaire. For example, in some cases, EMS system agency directors selected the EMS medical director category.

7.2 Overview of Questionnaire Results

The EMS Working Group released the Video Telemedicine Questionnaire on April 24, 2015. Several EMS, hospital, and emergency physician organizations helped distribute the questionnaire to their memberships. During a 30-day period, more than 670¹¹ responses were received from EMS agencies, hospitals, trauma centers, EMS medical directors and online medical control physicians. Responses were also received from EMS training personnel, PSAP managers, emergency management officials, and other interested parties.



¹¹ A total of 679 responses were received. Nine responses were deleted as being either duplicate, incomplete, or corrupt resulting in a total of 670 responses represented in this report. The printed questionnaire results which are displayed later in the report reflect the full 679 responses, resulting in an error rate of less than 2%. Response data and percentages displayed in the report are calculated based on the true 670 number.

Of the 670 questionnaire responses received, the majority were from EMS organizations (n=483, 72%). EMS medical directors generated 113 responses (16.9%) while online medical control physicians generated 9 responses (1.3%). This brings the total physician respondent group up to 122 responses representing 18.2% of the overall feedback. Hospital and trauma center directors generated an additional 50 responses (7.5%). Finally, 15 respondents (2.2%) were categorized into the “other” category.

All questionnaire data was reviewed including respondent answers to multiple choice questions and a wide range of free text comments. A complete and unabridged listing of all comments provided by respondents is included in **Appendix A through Appendix D**.

The questionnaire demonstrated a strong interest in the use of video by EMS. The positive feedback was seen in both the response to specific video capabilities as well as in the patient care case studies.

Overall, the questionnaire found 77% of all respondents felt the prehospital use of video would be beneficial in certain patient care situations. The positive benefit of video for different stakeholder groups ranged from 68% for prehospital EMS providers to 64% for online EMS medical control physicians.

Comments made by respondents fell into two extreme categories. Feedback either greatly favored the adoption of video by EMS or felt that it was a very, very bad idea. Opinions were generally at either end of the spectrum and rarely portrayed a middle ground. The degree of negative opinion in the comments was at odds with the 77% of respondents who favored video usage. This may be due to the questionnaire design, which required respondents to complete multiple choice questions but did not require them to provide comments.

Video Capability Questionnaire Results

Since each respondent could select more than one video capability from the provided list, the report examined the single highest ranking for each question in order to isolate the number of individual respondents who favored any type of video use in the subject category. The percentages of respondents favoring specific video capabilities ranged from 64% in the medical control physician set to 68% in the EMS system set.

Video Capability Category	Highest Positive Response Rate
Medical control physician use of video	64.0%
Hospital Emergency Department/Trauma Center use of video	67.0%

EMS system use of video	68.6%
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Patient Care Scenario Questionnaire Results

Respondent data was then analyzed for each of the five patient care scenarios to determine if prehospital use of video would be deemed helpful. The results were reviewed for the entire respondent group and then segmented to determine if there were any significant differences between EMS agency representatives and physicians. The results indicate that between 77% - 78% of all respondents and respondent subgroups found video to be useful. Physician respondents felt video use would be most beneficial with the patient assessment case study involving a semi-conscious stroke patient. EMS agency respondents felt the best use for video would be with the mechanism of injury case study involving the trauma patient in the vehicle crash.

Full questionnaire results for each of the five patient care scenarios can be found in Section 7.3. A summary of the feedback for each case is presented below, showing individual charts for (1) all questionnaire respondents, (2) medical director/online medical control physicians and (3) EMS agencies:

All Questionnaire Respondents			
SCENARIO	Video Use Helpful	Video Use Not Indicated	No Opinion
Patient Refusal – Diabetic Patient	65.1%	27.5%	7.4%
Severe Injury – Motor Vehicle Trauma Patient	81.4%	15.5%	3.1%
Physician Assisted Patient Assessment – Stroke Patient	81.0%	14.3%	4.7%
Physician Assisted Patient Care – Pediatric Asthma Patient	79.5%	15.0%	5.5%
Mass Casualty Incident – Multiple Patients in Single Event	76.5%	20.0%	3.5%
Summary/Total	76.7%	18.5%	4.8%

Almost 77% of all respondents felt that video would be helpful, while 19% felt video was not needed and less than 5% said they had no opinion. The case study scoring the most benefit was a near tie between the mechanism of injury event (vehicle crash) and the patient assessment event (semi-conscious stroke patient). The lowest scoring case study was the patient refusal incident involving the diabetic.

Physician Feedback

Of 670 responses, 122 respondents either self-selected, or were manually categorized by NPSTC, into the EMS medical director or EMS online medical control physician group. When feedback from physicians was isolated from the overall questionnaire results, the percentages of support for video were very similar.

Medical Director/Online Medical Control Physician Respondents			
SCENARIO	Video Use Helpful	Video Use Not Indicated	No Opinion
Patient Refusal – Diabetic Patient	62%	33%	5%
Severe Injury – Motor Vehicle Trauma Patient	75%	23%	2%
Physician Assisted Patient Assessment – Stroke Patient	89.4%	10%	0.6%
Physician Assisted Patient Care – Pediatric Asthma Patient	86%	12%	2%
Mass Casualty Incident – Multiple Patients in Single Event	77%	21%	2%
Summary/Total	77.9%	19.8%	2.3%

These results indicate that almost 78% of physicians indicated that prehospital video would be helpful. However, it should be noted that nearly 2 out of every 10 physicians indicated that video usage would have not been helpful in the listed scenarios. Less than 3% of the physician respondents had no opinion. The case study scoring the most benefit was the patient assessment event involving the semi-conscious stroke patient. The lowest scoring case study was the patient refusal incident involving the diabetic.

EMS Agency Feedback

Of 670 respondents, 483 were categorized into the EMS agency group and their responses were isolated from the questionnaire results. The questionnaire results in the EMS agency group closely matched the overall questionnaire results and those from the physician group.

EMS Agency Respondents			
SCENARIO	Video Use Helpful	Video Use Not Indicated	No Opinion
Patient Refusal – Diabetic Patient	66%	26%	8%
Severe Injury Motor Vehicle Trauma Patient	85%	12%	3%
Physician Assisted Patient Assessment – Stroke Patient	80%	15%	5%
Physician Assisted Patient Care – Pediatric Asthma Patient	79%	15%	6%
Mass Casualty Incident – Multiple Patients in a single event	77%	19%	4%
Summary/Total	77.4%	17.4%	5.2%

More than 77% of EMS agency representatives found value in using video telemedicine, while 17% thought video would not be helpful and another 5% did not have an opinion. The case study that ranked as most beneficial was the mechanism of injury event involving the trauma patient in the vehicle crash. The case study that ranked lowest for video use was the incident involving the diabetic patient.

It should be noted the design of the patient care scenarios did not have universal acceptance by the respondents. Many felt a diabetic patient refusal would not warrant a call to medical control and would be handled by standing protocols. This case study scored the lowest positive indicator of all case studies, with a 66% approval rating by EMS and a 62% approval rating by medical directors and online medical control physicians.

Comments Based Impressions

A great deal of information was gathered during the questionnaire process, including more than 3,000 lines of comments. This feedback represented the unique issues, concerns, and

desires of EMS agencies across the U.S. It also provided insight into the differences faced by urban, suburban, and rural EMS providers.

Several consistent themes emerged during a review of the entire set of comments that were submitted. It has been previously noted that the respondent comments did not always match or reflect the scoring of the patient care scenarios and the video capabilities list.

The following impressions are based on comment feedback from all 670 respondents:

Positive Benefits of Video Telemedicine:

- ✓ Live video is needed for stroke assessment validation/enhancement.
- ✓ Best use for Community Paramedicine (CP-MIHC) and “gray zone” patient presentations.
- ✓ Best use for patient refusals and risk management documentation.
- ✓ Situational awareness from EMS to PSAP and ED will be enhanced.
- ✓ 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).

Negative aspects of Video Telemedicine:

- χ Time delay for EMS to use the equipment (activation time, process time).
- χ Time needed in ED to conduct video consultations (physicians are too busy).
- χ Big Brother syndrome, surveillance, over reach by Medical Control.
- χ Liability, HIPPA.
- χ Cost to purchase and maintain the system; cost to train personnel.
- χ Will not improve medical care outcome (protocols handle all situations now).

A review of EMS medical director and ED physician comments revealed the following themes:

- Physician and hospital responses tracked EMS results (no significant gap)
- Physicians and EDs expressed more interest in live video than in a video clip or still image.
 - Especially true for stroke patient assessment
- Physicians saw the greatest benefit in:
 - Community paramedicine programs
 - Patient diversion to Urgent Care or Clinic vs. ED
 - Patient refusal risk management
 - Enhanced patient care documentation
 - Potential use in field mental health exam
- Physician respondents expressed concern:

- HIPPA compliance (who owns the video?)
- Potential for increased litigation
- Time to manage video conference calls (staffing)

Approximately 10 questionnaire respondents indicated their EMS systems were using, or were about to start using, a prehospital video system. There was also concern that existing commercial broadband cellular systems had insufficient coverage and were unreliable. Some responses indicated a lack of awareness of the FirstNet project to activate a public safety broadband network.

Many respondents felt the use of video technology would be distracting for EMS crews and for patients and could divert the paramedic's attention away from their primary mission while also delaying patient care. To resolve this issue, respondents indicated the technology must be easy to use and governed by strong training and policy.

There was generalized concern over how to manage patient privacy including bystanders and the patient's family who may be caught on camera.

EMS personnel expressed concern that video and images might create more questions from medical control physicians who feel the need to clarify what they would be seeing in the video feed. It was noted that video and still images may not portray the entire patient condition and may be misleading. Some EMS respondents were also concerned that a video telemedicine program may turn into a "video surveillance program" used by management against employees.

A common theme among most respondents was that a video telemedicine program must be easy to use, reliable, and not impact or delay patient care. It was also felt that video is just one component of a larger data exchange between EMS personnel and health care organizations and should be complimentary to that effort.

There was broad consensus among the questionnaire respondents in the following topical areas:

Training: It was noted that video should not be a substitute for effective training and a commitment to maintain the medical care competency of field personnel. Hospitals and medical control physicians will also need training on the proper interpretation and action resulting from a prehospital video (just as EMS providers will need training and policy direction).

Scope of Practice: EMS personnel expressed concern over video leading to a shift in patient treatment in which they defer medical care decisions to physicians and nurses. A few medical

control physicians advised they do not have time to engage in video consultation and that they are frequently managing EMS radio calls from the bedside of another patient in the ED. They concurred that paramedic training and scope of practice issues should not be allowed to erode as a result of video usage.

Cost: Several agencies, including many rural agencies, noted their budgets are currently constrained and would not be able to support the cost to implement and maintain a video program.

Public Relations: Training of EMS personnel on the proper use of the system and how to explain the program to patients and their families is critically necessary to insure a successful program.

Best Venue for Video: Video telemedicine was thought to be most helpful during extended transport times and of limited use in urban areas. CP-MIHC programs will likely need video telemedicine linking to a telemedicine base station, not an ED. Respondents felt that live video consultation with a physician may help convince the patient to seek ED evaluation when they would otherwise refuse care.

Concurrent Needs: Problems with technology implementation in air ambulances (helicopter and fixed wing) need to be addressed. Video consultation regarding critical care patients during long transit times would be beneficial. Real time vital signs and other patient telemetry data is considered to be complimentary to or more important than a video image/consultation. 12-Lead EKG transmissions are still not widely available throughout many EMS systems and many respondents felt that gap should be addressed first. Additional evolving technologies should also be examined in the context of improved patient care. For example, Bluetooth stethoscopes allow EMS teams to send auscultation of lung sounds and heart tones to a physician for interpretation and some EMS systems are experimenting with the use of ultrasound devices in the field which could transmit imagery to the ED.

There were several comments regarding system implementation. Is it more efficient to send telemedicine and video data to an ED physician or to a dedicated base station physician?

It was also noted that video can improve EMS crew safety and provide a variety of other administrative functions. Video should be available to PSAPs and EMS dispatch centers as well as with EMS field supervisors to provide better resource allocation and support.

There was considerable support for additional research to determine how video telemedicine will impact patient outcomes.

Telemedicine Video Success Factors

The EMS Working Group studied the questionnaire results and comments and developed a draft set of success factors for implementation of prehospital video programs:

- Identification of specific clinical and/or operational use in which benefits of program outweigh negative components of implementation. This also requires an analysis of the applicable local or state laws involving video.
- Creation of a comprehensive budget which assesses the full impact of the video program, including equipment/software purchase/license, installation, maintenance, support, training, replacement, etc. In addition to expenses, potential cost savings to the healthcare system, agency, and patient should be evaluated.
- Identification and engagement of stakeholders of video program with all impacted groups (EMS, hospitals, physicians) to obtain input and buy-in into policy, procedure, and operations.
- Comprehensive policy guidance on how equipment and video will be used, stored, and accessed, including type(s) of video (live streaming, video clips, or still pictures) as well as execution of inter-local agreements between EMS and area hospitals to govern video content use, liability, etc. Medical directors should play a prominent role in this guidance.
- Selection of equipment/software that meets clinical, operational, and regulatory (FDA) requirements; that is reliable, easy to manage and maintain with good vendor technical support; and easy to use in the field without creating a distraction to EMS personnel. Pilot projects are strongly encouraged in which field users test and provide feedback on potential solutions for a range geographic and use applications.
- Provision for HIPAA-secure data storage on device, for secure data transmission to final storage location, and secure transmission to end point (hospital ED, dispatch center, etc.)
- Training for all users (personnel wearing/carrying devices or cameras, personnel managing infrastructure and network, personnel consuming the video) to make sure each group understands and is competent in their role. To include use and HIPAA safeguards aspects.
- Solutions should have compatibility with both FirstNet and commercial carrier networks to maximize connectivity. Compatibility with and leveraging mobile devices typically carried by EMS (laptops, tablets, pads, phones) is desirable to reduce costs.

- Outreach education to patients and users of EMS services (nursing homes, urgent care centers, etc.) on the video telemedicine program and what policy and privacy safeguards are in place.
- Quality assurance/quality improvement framework to validate video program is meeting the intended clinical and operational need and not negatively impacting patient care, response times, patient perception of care, etc. A system is needed to identify issues early, provide remedial education where indicated, and to resolve inter-agency issues and problems.

8.0 Conclusions

The development of the FirstNet public safety broadband wireless network will provide the conduit for many new disruptive technology innovations that will enhance the capabilities of our nation's first responders. For emergency medical services, the most prominent utility of such a dedicated network is mobile telemedicine.

Setting the Stage for the Widespread Adoption of Mobile Telemedicine

Trends in healthcare policy and financing coupled with technological advances suggest that telemedicine is an innovation whose time has come. A recent article in the Journal of the American Medical Association (JAMA), one of the nation's most influential medical publications, highlighted three forces fueling a surge in the widespread adoption of mobile health tools.

- The need for "disruptive solutions" to control unsustainable healthcare spending.
- Rapid improvements in reliability and availability of wireless connectivity, with more than 3.2 billion mobile users worldwide, and the capacity for instantaneous, bidirectional transfer of information.
- A shift toward "more precise and personalized" medicine, which requires individualized data streams that go beyond current data collection systems.

The Role of Telemedicine in EMS

In its vital role as the nation's emergency medical responders, EMS is in a prime position to take advantage of the transformative potential of telemedicine to benefit patients and the EMS profession. Already, EMS agencies are implementing or exploring telemedicine as a means to:

- Enhance decisionmaking during time-sensitive emergencies such as stroke and trauma.
- Improve preparedness, triage, and situational awareness for disaster or mass casualty situations.
- Improve the integration of EMS with hospitals and the wider healthcare delivery system.
- Demonstrate the value of EMS to the community through CP-MICH programs that reduce healthcare costs and improve patient care.
- Provide a better mechanism for medical legal documentation and quality improvement.

- Pave the way for new and alternative care and transport models.

It is clear from the questionnaire that there is strong support for mobile telemedicine and video usage. Almost 77% of all respondents felt that video would be helpful, while 19% felt video was not needed, and less than 5% said they had no opinion. Results from both the EMS and physician perspectives were similarly positive.

As indicated by the questionnaire results, mobile telemedicine use applications are widely varied; there's no one-size-fits-all solution and need will drive innovation. A key to utilization is appropriate use – use that provides real value, not just because it's a cool gadget. Quality, cost-effective patient care must be the primary focus.

There are some logical recommendations that surface from this report.

- More work is needed to educate all EMS stakeholders on the capabilities of the FirstNet public safety broadband network.
- EMS agencies and stakeholders need to better understand the capabilities of video systems, including their benefits and risks.
- EMS telemedicine pilot projects that use video need to be monitored to identify real world issues, best practices, and errors.
- Research is needed to determine quantitatively whether prehospital video systems positively impact patient outcomes.

NPSTC will continue to evaluate these recommendations and engage with the EMS community.

APPENDIX A: Questionnaire Results by Question

This section provides the statistical analysis of each question posed in the questionnaire and also includes a summary of the comments that were filed by the respondents to this specific question. It should be noted that 679 respondents completed the questionnaire and the results are displayed here. However, nine responses were eliminated as either being duplicate or incomplete.

Please note that the “Number of Responses” column may total more than the total number of questionnaire respondents (679). This is because some questions allowed for multiple responses (e.g., check all that apply). The first appears in Question #5.

Appendices B through E include a list of all comments that were received. Those comments are displayed as they were received and have not been edited for grammar or spelling. If a respondent provided personal identifying information, it was removed.

Question #1: EMS Role of Questionnaire Respondent

Are you a/an:				
Answer	0%	100%	Number of Response(s)	Response Ratio
EMS System Responder.			402	59.2 %
EMS System Medical Director.			113	16.6 %
Hospital Emergency Department or Trauma Center Director.			22	3.2 %
Hospital ED online medical control physician.			8	1.1 %
Other			128	18.8 %
No Response(s)			6	<1 %
Totals			679	100%

Summary of Responses

More than 50% of the respondents represented EMS agencies. EMS system medical director and online medical control physician comments were merged into a single group for analysis. The majority of responses in the “Other” category represented EMS agency management personnel, including EMS system directors, quality assurance managers, and training supervisors.

Question #2: Population of Service Area

Please describe the population of the area served by your EMS organization or hospital:				
Answer	0%	100%	Number of Response(s)	Response Ratio
< 50k.			310	45.6 %
50k to 100k.			104	15.3 %
100k to 250k.			84	12.3 %
250k to 500k.			68	10.0 %
> 500k.			106	15.6 %
No Response(s)			7	1.0 %
Totals			679	100%

Summary of Responses

Results match the expected distribution of EMS systems across the U.S. Almost half of the questionnaire responses were from agencies and hospitals serving less than 50,000 persons.

Question #3:

Please indicate the approximate square miles served by your department/organization?(answer should be provided in square miles)





635 Response(s)

Summary of Responses:

Service area for EMS agencies were noted to be as low as .15 square miles, covering a portion of a single city, to a high of 415,000 square miles, covering an entire state. These responses confirmed that the questionnaire respondents represented urban, suburban, and rural service areas.

Question #4:

What are the typical transport times from the scene to the receiving hospital?











Answer	0%	100%	Number of Response(s)	Response Ratio
< 15 minutes.			300	44.1 %
15-30 minutes.			303	44.6 %
> 30 minutes.			66	9.7 %
No Response(s)			10	1.4 %
Totals			679	100%

Summary of Responses:

There was a typical transport time of less than 30 minutes in 88.7% of all responses, with 44% of those respondents indicating that their transport time was less than 15 minutes. Just less than 10% of respondents indicated a transport greater than 30 minutes.

Question #5: Medical Control Physician Use of Video Telemedicine

Check all of the video/picture image telemedicine uses that you feel are beneficial in the EMS prehospital setting. These questions relate to how Medical Control Physicians would use this technology. You can also add comments regarding Video/Picture telemedicine and Medical Control.

Answer	0%	100%	Number of Response(s)	Response Ratio
Medical Control - better decision making/risk mitigation on patient refusal requests.			389	60.5 %
Medical Control - better decision making on termination of resuscitation in the field.			248	38.6 %
Medical Control - better decision making on patient treatment and enhanced paramedic voice report.			286	44.5 %
Medical Control - physician assisted, real time, critical care support, and direction to field personnel.			411	64.0 %
Medical Control - better decision support on transport destination.			194	30.2 %
Medical Control - better decision support on transport modality (ground vs air).			160	24.9 %
Medical Control - better decision support for field triage.			181	28.1 %
Medical Control - physician assisted decision support/management for wounds or rash following chemical/biological hazard.			228	35.5 %
Medical Control - better decision support / direction for mobile health / community paramedicine visits.			368	57.3 %
No opinion on this topic.			49	7.6 %
Totals			642	100%

Summary of Responses:

This question sought to identify how medical control physicians might use video. The respondents include both physicians and EMS providers.

The highest scoring uses included:

- Physician assisted critical care (64%)
- Risk management/mitigation – patient refusal scenarios (60.5%)
- Improved decision support/Community Paramedicine (57.3%)

The lowest scoring uses included:

- Transport modality decision making (24.9%)
- Improved field triage support (28.1%)
- Improved transport destination (30.2%)









Summary of Comments:

This question generated a significant number of comments from the respondents who also noted other uses for broadband data:

- The broadband public safety network should also transmit 12-lead EKGs directly to ED and to STEMI team from field, allowing EMS personnel to bypass the ED and go directly to Cath Lab.
- Enhanced notification/activation of specialized teams would be accomplished with video and other data transmissions.
- To be successful, the technology must be compatible with hospital work flow.
- A video telemedicine program should improve the relationship between EMS and hospital ED and other hospital departments.
- Video transmission is less valuable during critical care incidents. Teams should be trained to treat the patient without additional consultation. Video would be more valuable with highly specialized emergencies or “gray areas” involving patients with multiple diagnoses.
- Inter-facility critical care transports, including aeromedical flights, would benefit from this technology.
- Transmission of ultrasound images from the field to the ED would be helpful in certain clinical situations.
- CP-MIHC use would benefit from video consultation with health care providers.
- In many systems, medical control is not in the hospital ED. How will the ED receive the video consultation or images? In other systems, a nurse handles the EMS radio call and a physician is not available.
- A picture can be worth 1,000 words but video and images can also distort the actual patient presentation.
- Scene video can be useful to case managers and social workers to assess patient home condition.
- Video is a great benefit during a complicated patient refusal situation.
- Video may allow for expanded scope of practice and better patient outcomes.

Question #6: Hospital Emergency Department/Trauma Center Use of Video Telemedicine

Check all of the video/picture image telemedicine uses that you feel are beneficial in the EMS prehospital setting. These questions relate to how Hospital Emergency Departments would use this technology. You can also add comments regarding Video/Picture telemedicine and Hospital Emergency Departments.

Answer	0%	100%	Number of Response(s)	Response Ratio
Hospital ED - greater awareness of incoming patient status - critical care patient.			425	67.0 %
Hospital ED - video/picture documentation of patient status/presentation pre-treatment.			317	50.0 %
Hospital ED - enhanced decision making on when to activate trauma team/stroke team/stemi team.			380	59.9 %
Hospital ED - enhanced notification / activation of trauma team/stroke team/stemi team.			360	56.7 %
Hospital ED - improved patient care from visualization of scene or mechanism of injury.			384	60.5 %
Hospital ED - additional quality assurance component of patient care - post incident QA analysis.			271	42.7 %
Hospital ED - additional training component - live or post incident analysis.			307	48.4 %
No opinion on this topic.			48	7.5 %
Totals			634	100%

Summary of Responses:

This question sought to identify how hospital emergency departments and trauma centers might use video. The respondents include both physicians and EMS providers.

Highest scoring uses include:

- Greater awareness of incoming critical care patients (67%)
- Improved patient care from visualization of scene/mechanism of injury (60.5%)
- Enhanced decisionmaking, trauma and stroke team activation (59.9%)

Lowest scoring uses include:

- Quality assurance component and post incident analysis (42.7%)
- Additional training component (48.4%)

Summary of Comments:

This question generated a significant amount of comments from the respondents who also noted other uses for broadband data:

- Video usage would likely EMS more than the hospital/trauma center.
- Patient visualization by ED and physician will result in expeditious activation of critical care teams, when used in conjunction with other assessment parameters.
- Specific criteria should be defined for video transmission to ensure it is used efficiently and not as a routine matter.
- Telemetry and capacity status information for EMS units and hospitals should be shared before live video is shared. There is a need for hospitals to visualize EMS incidents in real time and EMS units need to see hospital ED capacity information in order to make better transport decisions.
- Most EMS systems have strong protocols in place to trigger the alert for trauma, STEMI and Stroke teams and that alerting may not be enhanced with video.
- Video would benefit basic life support systems more than ALS systems with physician, nurse, or even paramedic consultation for the EMT.
- Video should also benefit an agency's quality assurance/quality improvement program and associated training components. This should be done in a non-punitive way.

Question #7: EMS System Use of Video Telemedicine

Check all of the video/picture image telemedicine uses that you feel are beneficial in the EMS prehospital setting. These questions relate to how EMS Systems would use this technology. You can also add comments regarding Video/Picture telemedicine and EMS System First Responders.

Answer	0%	100%	Number of Response(s)	Response Ratio
EMS System - quality assurance component of patient care - post incident QA analysis.			410	61.4 %
EMS System - additional training component - live or post incident analysis.			430	64.4 %
EMS System - video/picture documentation of access to stored narcotics.			190	28.4 %
EMS System - video/picture documentation of patient status/presentation pre-treatment.			346	51.8 %
EMS System - risk management on patient refusals.			458	68.6 %
EMS System - risk management - documentation regarding patient's valuables.			237	35.5 %
EMS System - risk management - documentation of unruly patient behavior on scene.			452	67.7 %
EMS System - enhanced crew safety.			338	50.6 %
EMS System - better decision support for field triage.			264	39.5 %
EMS System - better decision support for critical care transport.			345	51.7 %
EMS System - better decision support / direction for mobile health / community paramedicine visits.			382	57.2 %
No opinion on this topic.			28	4.1 %
Totals			667	100%

Summary of Responses:

This question sought to identify how EMS agencies might use video. The respondents include both physicians and EMS providers.

Highest scoring uses include:

- Risk management on patient refusals (68.6%)
- Risk management, unruly patient behavior (67.7%)
- Additional training component (64.4%)

- Quality assurance/post incident analysis (61.4%)

Lowest scoring uses include:

- Documentation on narcotics access (28.4%)
- Documentation on patient valuables (35.5%)







Summary of Comments:

This question generated comments from the respondents who also noted other uses for broadband data:

- There was some discussion that risk management elements of video should be studied further. Video capture of a violent or unruly patient may make the situation worse.
- Other respondents felt that all aspects of care would be enhanced as well as risk management and QA/QI. The ability to see and record secure video should only help enhance patient care and lower the risk for EMS personnel.
- Medical control physicians are sometimes hesitant to support a patient refusal request. Video might help clarify the true patient condition.
- There was concern that patient video cannot be used legally for training due to HIPPA privacy protections.
- Community paramedicine without direct access to a physician can be risky and a video link would make this function more efficient.

Question #8: Patient Refusal – Diabetic Patient Scenario

Patient Refusal Scenario. EMS personnel have arrived at the scene of an adult diabetic patient who is unconscious. They start an IV and administer glucose and the patient is now awake and refusing transportation to the hospital. The paramedic advises that the patient is being monitored by family and will contact their primary care physician. There are no other signs or indications of a medical problem and the paramedic is in agreement that the patient can remain at home. Which of the following would be helpful for the EMS medical control physician?

Answer	0%	100%	Number of Response(s)	Response Ratio
Live video - consultation directly with the physician and patient.			334	50.0 %
Live video - from paramedic (allows doctor to see the patient, but no interaction).			125	18.7 %
Picture image of the patient (to see skin color and overall condition).			104	15.5 %
Video clip to document the summary and refusal acknowledgement.			284	42.5 %
No video/picture is needed, voice consultation is fine.			184	27.5 %
No opinion on this topic.			50	7.4 %
Totals			667	100%

Summary of Responses:

Respondents saw the greatest benefit in live video consultation between patient and physician (50%), followed by video clip documentation of patient refusal acknowledgement (42.5%). It was noted that many EMS agencies manage this patient presentation without any need to consult medical control. This may explain why 27.5% of respondents indicated that video was not needed in this situation.

Summary of Comments:

This question also generated comments from the respondents who noted other issues and situations for EMS use of video.

- The ability for direct communication between the physician and the patient that is refusing care could be beneficial for all patients and not just the diabetic patient mentioned in this case study question. Video would better allow the physician to determine the patient’s mental status and their competency to refuse EMS care.
- Other respondents noted this was a poorly selected scenario. Most diabetic patients are handled by protocol without physician consultation.

- Some physicians expressed a liability concern as to whether their malpractice insurance covered the provision of medical advice to a patient that he/she does not have an existing relationship with.
- Several respondents noted that direct video interaction between the physician and a patient suffering a mental health crisis would provide a better assessment.
- Live video interaction with a physician would also allow the appropriate redirection of non-emergent patients to better healthcare options and enhance a paramedics' ability to obtain field refusals.
- Some physicians expressed concern over the Emergency Medical Treatment and Active Labor (EMTALA) law when using video to interact with a patient. One respondent noted that in the State of Kansas, video conference counts as a physician being "present" which would put increased liability on that doctor instead of on the EMS service medical director.
- Other respondents noted video interaction should not be required but should be a resource that is available when needed. The online physician should be able to ask for a level of interaction that makes the physician comfortable with the outcome of the encounter

Question #9: Severe Injury – Motor Vehicle Trauma Patient Scenario

Trauma Patient - Mechanism of Injury Scenario. Paramedics are at a vehicle crash scene and report a 40-year-old female with low blood pressure complaining of abdominal pain. The patient is being packaged for transport to the trauma center and the paramedic is giving a report. Which of the following would be helpful for the trauma center team either pre or post arrival?

Answer	0%	100%	Number of Response(s)	Response Ratio
Live video sent to ED/Trauma Center from the paramedic's wearable camera of the incident scene to show vehicle damage and mechanism of injury.			292	43.9 %
Video clip sent to ED/Trauma Center from the paramedic's wearable camera of the incident scene to show vehicle damage and mechanism of injury.			343	51.6 %
Picture image of vehicle damage and mechanism of injury sent from incident scene to ED/Trauma Center.			365	54.9 %
Still image or video clip shown by paramedic upon arrival in the ED.			218	32.8 %
No video/picture needed - paramedic voice radio report is all that is needed.			103	15.5 %
No opinion on this topic.			21	3.1 %
Totals			664	100%

Summary of Responses:

Respondents saw the greatest benefit in the transmission of a still image of the incident scene to the ED in advance of EMS arrival at the hospital (54.9%). Transmission of a video clip from the scene was recommended nearly as often (51.6%). The transmission of live video from the scene was only recommended by 44% of the respondents. Almost one-third of respondents (32.8%) indicated the image or video could be shown by the paramedic to the physician at the time of arrival in the ED. It should also be noted that 15.5% of respondents indicated that video or picture images were not indicated in this scenario.

Summary of Comments:







- Many respondents felt a video or still image would greatly enhance the ED’s understanding of the mechanism of injury and other overall severity of the situation. It was noted that in some cases, the patient does not present with signs and symptoms consistent with the damage done in the crash.
- Other respondents felt there was little value in the transmission of incident scene pictures. They noted that mechanism of injury information (MOI) can be relayed by the

paramedic on scene and MOI is not a reliable predictor of severity or outcome. Seeing the video image may be distracting for the clinician.

- Head injury assessment requires a good neurologic skill set which could be enhanced with live video.
- Respondents noted that it was important for the cameras to transmit accurate color images in order to accurately assess the patient's condition.
- Several respondents noted the advantage of a video clip, which could be replayed if needed or shared with others. During a live feed the physician cannot "rewind" the incident to look at a particular area of interest.
- Other respondents noted the information gained from the video should be shared with the ED as soon as possible. There is less value in the information when the patient arrives at the ED and personnel are engaged directly with patient care.

Question #10: Physician Assisted Patient Assessment – Stroke Patient Scenario

Patient Assessment Scenario. A basic life support unit is on the scene of a patient who is semi-conscious and was reported by the family to have stroke like symptoms. The EMT crew has contacted medical control to determine if they should transport the patient to the closest hospital or transport to a more distant hospital that is a certified stroke alert center. The local paramedic crew is not available. Which of the following would be helpful to the medical control physician or Neurologist in assessing this patient?

Answer	0%	100%	Number of Response(s)	Response Ratio
Live video - consultation directly with doctor and patient's family while viewing the patient.			388	58.1 %
Live video - from EMT (allows doctor to see the patient, but the only interaction is with the EMT).			293	43.9 %
Video clip of the stroke assessment showing how patient presented on scene.			302	45.2 %
Still image of patient.			43	6.4 %
No video/picture is needed, voice consultation is fine.			96	14.3 %
No opinion on this topic.			32	4.7 %
Totals			667	100%

Summary of Responses:

The majority of respondents recommended the use of a live video consultation between the physician and the patient/patient’s family (58.1%). Live video interaction between the EMT and the physician was seen as less helpful (43.9%) as was the transmission of a video clip showing the stroke assessment (45.2%). There was little support for the use of a still image to support this situation. It should be noted that 14% of respondents indicated video was not necessary in this scenario.

Summary of Comments:

- Most respondents felt that video interaction would be beneficial and would result in better decisionmaking.
- Video would be helpful for real time decision support and retrospective review
- Other respondents felt that video could provide direct interaction between the neurologist which might allow the patient to bypass the ED and proceed directly to a CT scanner.
- Some physician respondents noted that the standard stroke assessment performed by EMS personnel is an abbreviated version of the more complex NIH scoring that a

physician would perform. Live video interaction would allow for additional testing, but should be done en route to the hospital and not increase the on-scene time.

- Live video consultation would also allow for better air ambulance utilization and patient destination decisions.
- Other respondents noted that live video would help with the decisionmaking to activate a paramedic intercept unit from an adjacent jurisdiction is necessary.
- One respondent noted they have been doing live video stroke assessment in the ED for about 4 years and it is very beneficial.
- Other respondents noted the patient's family often has the best information on the patient's baseline level of consciousness and immediate access to the family to obtain the patient's history is very important. Family members frequently arrive many minutes after the ambulance has reached the ED. Having a live video consultation capability would allow the physician to interview the family at the scene while the patient is being packaged for transport.

Question #11: Physician Assisted Patient Care – Pediatric Asthma Patient Scenario

Physician Assisted Patient Care Scenario. EMS personnel are transporting a pediatric asthma patient from a rural area with an extended transport time. The paramedic sees that the patients condition is deteriorating and is requesting advice on the proper course of treatment. Which of the following would be helpful?

Answer	0%	100%	Number of Response(s)	Response Ratio
Live video consultation with paramedic using a helmet camera, allowing physician to visualize patient's overall condition and provide step by step instructions if necessary (ie: video laryngoscope).			424	63.7 %
Video clip from paramedics camera showing patient condition (skin color, degree of respiratory distress).			316	47.5 %
Still image patient.			41	6.1 %
No video or image data is necessary; the physician can talk the paramedic through the necessary procedure.			100	15.0 %
No opinion on this topic.			37	5.5 %
Totals			665	100%

Summary of Responses:

Most respondents favored the use of live video consultation between the paramedic and the physician (63.7%) in this case. Almost half of the respondents also indicated the transmission of a video clip would help convey the patient condition to the physician (47.5%). Almost 20% of the respondents felt that video is not indicated in this case (15%) or that they had no opinion on the use of video (5.5%).






Summary of Comments:

- Most respondents felt that live video would help make a determination on the next level of treatment for the patient (since the original treatment course was not working). Live video could support a decision to move directly to endotracheal intubation instead of trying another round of drug therapy.
- Some respondents felt live video might encourage a medical control physician to ask the paramedic to initiate a patient care action that was outside of their scope of training.
- Most respondents felt the paramedic should be capable of performing an intubation without any direction from medical control. However, it was noted that there may be unusual situations and case presentations where tracheal visualization may be helpful.

- Several physicians noted they would be very receptive of a video program in the rural areas where they practice.

Question #12 Mass Casualty Incident – Multiple Patients in a Single Event Scenario

Mass Casualty Incident Scenario. A paramedic supervisor contacts medical control and/or local hospitals from the scene of a school bus crash to provide an update on the number and severity of a range of patients. Which of the following would be helpful to the medical control physician and/or hospital ED personnel?

Answer	0%	100%	Number of Response(s)	Response Ratio
Live video - showing the crash scene, the number of patients, and a general indication of the status of the patients.			383	57.3 %
Video clip - sent to ED/Trauma Center showing the number of patients and general conditions at the scene.			315	47.1 %
Picture image or series of pictures of the crash scene sent to the Emergency Department to assist in triage or preparation.			250	37.4 %
No video or pictures are needed, radio voice report is sufficient.			134	20.0 %
No opinion on this topic.			24	3.5 %
Totals			668	100%

Summary of Responses:

The majority of respondents indicated that live video from the MCI scene to the Emergency Department would provide enhanced situational awareness (57.3%). Slightly less than half, 47.1% of respondents, also felt that a video clip of the scene transmitted to the Emergency Department would be helpful, while 37.4% felt that a still image of the incident scene would be sufficient. Consistent with prior questionnaire results, 20% of respondents indicated that video and/or picture imagery were not indicated in this scenario.

Summary of Comments:

- Most respondents felt that any information that provides an accurate overview of the MCI scene would be helpful. Today, in some cases, ER personnel watch the local TV news station to get updates.
- Some respondents expressed a concern the video transmission may overwhelm the ER staff and that a clear and concise radio or telephone report would be more beneficial.

Other respondents felt that taking time to watch the scene video would delay the ED's preparation to receive patients.

- Some respondents expressed concern that medical control physicians would try to exert influence into the patient triage and transport decisions, when those activities are covered by protocol and must occur rapidly.

APPENDIX B: General Telemedicine Comment and Feedback

NPSTC is providing all of the questionnaire responses in order to allow the reader of the report to better appreciate the full conversation that was recorded during this process. The responses are presented exactly as they were received with no editing by NPSTC.

General Telemedicine Questionnaire Comments

1. Time to manipulate the items before the images are sent, will take time from patient care.
2. Big concern for patient privacy as wireless signals can be intercepted by hackers.
3. I would prefer to see any monies available for this type of technology be diverted to provide state of the art patient care equipment such as cardiac monitors, glide scopes (video mounted laryngoscope), etc.
4. If video/pictures are sent, how much time will be spend answering questions from medical control that really are not pertinent to the prehospital setting and will take time away from transporting the patient?
5. Seconding guessing by hospital ED personnel of how field providers work when they have no experience in field work.
6. The cost of this equipment may be too much for certain services or may divert money away from better patient care equipment.
7. If a person forgets to turn on their camera or there is a camera failure, will there be an increased liability to the field provider?

A camera on an EMT or Paramedic could be a great thing if they are in need of help. However, it could also get in the way if a physician is barking orders while EMS is trying to work.

A lot of capabilities. Many of these will be "transitional". In the Emergency TV series the paramedics sent a "strip" to verify V-fib. Much of what we are trying to do now is similar. As these new roles and capabilities come into being I think the well trained paramedic will soon be able to master most of this. I also think we are going to have a difficult time getting the busy ED physician to leave his patients to spend a lot of time in front of the TV. My EMS is hospital based. Georgia has funded four rural hospitals in a "Rural Hospital Stabilization Program. Ours hospital is one of those. We will be working with many agencies, State and Local, to develop many of these capabilities. It will be like a roller coaster....scary as hell but fun nevertheless.

Any live video feed could be looked upon as intrusive and make many first responders feel defensive as if the physicians don't trust them and have the need to be a "back seat driver" and "Monday morning quarterback" their treatment. There is a time and place for live video feed and as long as the first responders have the decision on when to go live and when not to, it would be a benefit to everyone. If it becomes a mandated issue and starts to hinder the first responders duties while they are extricating a patient from a vehicle accident, carrying an acute patient down the stairs, etc. then it would cause big problems. Sometimes we have to tell the MICN to cease her radio traffic because she wants information but we are too busy with a critical patient to give it to her at that point. As long as the decision stayed with the first responders of when the best time to take video is and when to send it, then I see this technology being extremely beneficial.

As a EMT your scope of practice and protocols limit you on what you can do with a patient regardless of what the doctors see or hear at a incident.

As a paramedic as well as an IT support person, I'm excited to see the possibilities of Live Video, etc. become available. However, in my opinion, it can only be successful if 3 things happen, 1. It's easy to use, 2. It's reliable, and 3. It doesn't delay or affect actual patient care. I have seen many times where personnel are trying to "get the damn EMS tablet to work" that they neglect or don't pay as much attention to patient care, and frustration levels mount quickly if they get a few reports behind because "the tech stuff" isn't working right.

As previously noted above, while there would be beneficial options available to pre-hospital EMS providers and receiving facilities, in my opinion, it does not justify the cost of acquisition and training of this advanced technology. If there seems to be documented generalized nationwide near-failures of current EMS TTP, then I say train the people. There IS, however, both past and current documentation of Comms failures in various incidents, both militarily, and within the various jurisdictional agencies. Do we need to contribute to this existing fail? IF there were to be an EMP/HEMP incident, it goes without saying that ALL of the electronic technology would be rendered immediately USELESS. However, current, competent EMS hands-on training is invaluable

Liken the use of GPS technology to the knowledgeable use of the basic compass/navigation concepts...would our SAR teams and military field personnel be useless without GPS availability?

As stated above I am in favor of some video and photography. The main concern is that it doesn't in any way cause a complication to accessing the patient and treating as needed. It seems when new things come out like this it gets mandated and becomes more a complication or a distraction. My hope is that it doesn't become a must have "or else" or a "you will do this on every encounter".

As with any video it can be good and useful, if used correctly. However, it will always be used to second guess and for liability reasons.

There should be nothing to hide and if doing the job correctly then there is nothing to worry about, except for those that will second guess to create doubt which will then create liability.

Good Luck
At the risk of repeating my perspective, I think there is some value to the concept but in very limited situations. And if the prehospital providers are capable, it should not be necessary.
Thank you for the opportunity to weigh in.
AV monitoring of pts and situations in the prehospital setting would be most beneficial in order to assess patient situation and prepare receiving medical facility for rapid assessment, such as clearing a CT scanner for assessing trauma injuries, etc. But also in the pre admission aspects of patient registration. This would also be beneficial in getting the patient to the most appropriate facility.
Bandwidth will be the issue.
Be careful with this technology. Live video and still images is still provides a limited view compared to the full senses of a properly trained paramedic. I don't think paramedics need someone looking over their shoulder in the heat of the moment.
benefits of the ability to stream live video are endless. Also need someone at the hospital to be available to use it.
Body cameras are fast becoming a reality in law enforcement. Body cameras not only protect the wearer, but also creates a reinforcement mechanism for good behavior, positive patient satisfaction, and a high standard of care.
Certainly has benefit in the field. The issue would be streamlining the process. Delay of care to utilize it would be detrimental, but in certain cases, particularly in CVAs, absolutely has a place.
Changes and improvements in technology can only improve our ability to provide accurate field care. However, we MUST NOT allow this change to lessen the skill of our provider. Additional tools should be used in confirmation of our Medic's line of thinking and can be helpful in "bringing the scene" into the E.D.
Concerns would be HIPPA and use of video in court. Protections extended to use as QA item. Ownership?
Cost associated with hardware, software and subscription fees with this level of technology will probably keep most agencies and hospitals from participating.
Cost of start-up and the cost to maintain Training of personnel in the use Storage of video (takes large amount of space) Protection of patient rights (HIPPA)
Currently in use in our network as a pilot. We have encountered several of the examples listed and have had positive results.
Depending on how video is used will affect patient outcome. I believe in most instances it will take too long to set up and will take a provider (probably driver) away from other duties to set up video connection, hold camera and other A/V duties.

Enhanced ability to communicate as a replacement to VHF radio. Instant message between dispatch, ambulance, hospital, etc. Sending of patient data to hospital. Video and images that help show mechanism of injury or the entirety of a large situation would help communicate the extent of an incident. Telemedicine and management by video would be time intensive for MD and technology could distract from hands on assessment.
Great for the paramedics and ambulance service but for our small community of maybe 400 people - no
Great opportunity to provide better care in the moment as well as improve the system through appropriate QA/PI processes. Bust protect against deterring aggressive patient care or delays in care.
Great topic to survey
Having the ability to begin treatment planning prior to arrival supports Idaho's efforts to improve the care of patients with a Time Sensitive Emergency (trauma, stroke, stemi)
Healthcare remains primarily a physician responsibility. With video technology, limited physician resource can be extended and quality of care improved.
HIPAA will be a concern, particularly in the mass casualty scenario where the patient visualized might not go to the hospital viewing the scene
HIPAA protected information sharing needs some safeguards in place.
Home healthcare will increasingly be provided via telemedicine-physician-guided care from a "base station" similar to those providing on-line medical direction for acute EMS issues. Communities will employ NG 911 linkage to remote medical experts for a variety of acute and chronic conditions. EMS telemedicine should be embedded in planning all regional "enterprise CAD" systems that link fire, law enforcement and EMS.
How would such technology be funded?
I am concerned about the liability of video/pictures with regard to public access.
I am concerned for the release of the pictures in regards to patient privacy. I am also concerned that it could make on-scene situations more complicated, especially with a non-cooperative patient that doesn't want their picture taken. I am concerned that our service will have to purchase expensive equipment (camera/video) and it will have to be maintained by a volunteer staff. I am concerned that basic skills and decision making will become deferred and weaken. I am concerned that emergency departments will be critiquing pictures and video and not positive feedback about patient care. I am concerned that the availability of doctors will be a limiting factor when trying to video and discuss.
I am happy to share the 18 months of research I have done already. I have design work completed and have limited beta testing
I am in support of this technology and product only if there is universal consensus on cost sharing, hardware, software, training, and support to all players involved.

I am not sure filling this out from a Air Medical perspective is helpful in your data but just in case. We cannot use cellular devices in flight but we do have some limited telemedicine capabilities by ground with our Neo team and we work a lot with the Co-Doc for stroke patients on inter-facility calls. Through these experiences we very much value the contribution potential of Telemedicine.

I am still very concern with the control of all images and conversations.

I believe that in many instances this would be a good tool for the paramedics and EMT's. I also believe that it will help to protect the care givers from any accusations made against them. There may be great difficulty in obtaining compliance from ambulance crews in initiating this.

I believe the greatest benefit would be to very rural EMS providers with long transport times.

I believe this tech. holds great promise. One area not addressed in the questionnaire is providing good customer service and ensuring that patients are not treated inappropriately.

I currently work at XXXXX and we are currently using this type of technology on one of ground MICU's. Soon we will have this technology on one of the aircraft. Preliminary results have been good but with anything there are minor road bumps. Telemedicine is a great idea and is the future of EMS.

I do not think using this type of technology would be the best idea. 1. Who is going to be paying for this equipment? There are many departments out there that barely have money to buy the things that they need. 2. In rural areas there are many time you can't get a signal to send a 12 lead. How would poor broad band/internet issues be addressed? 3. What are the legal implications for having pictures and videos now part of a legal record? 4. Is there any possibility that this information could end up on social media? How secure would this technology be?

I feel real time vital signs and potentially ultrasound and video laryngoscopy would be better than general video images. The Tempus Pro is a very interesting piece of equipment. How we could put this into use over the secure First Net system is intriguing.

The other issues are ownership and storage of these images. Do we need to have releases of patients in order to keep such images? How about QA use?

I feel that "go-cam" or "live helmet-cams" may approach HIPAA violation. If select videos or still images are utilized, info can be communicated and care taken to not violate patient privacy issues.

Also, my concern would be that news media might approach EMS crews on scene for video images.

<p>I feel that this technology would be of great assistance in the areas covered above and also in any instance where there is a distance between the caregiver and the receiving facility (between hospitals). The more information provided to the next caregiver in the process the better the patient outcome.</p>
<p>I feel that this type of action is not trusting the EMS decision is not good enough. That why we train.</p>
<p>I feel this is technology best suited to a clinic type operation, not the prehospital field setting. I feel like trying to use video or photo in the field does nothing but distract from proper patient care and build an unusual amount of reliance on other medical professionals to treat pt. I think time and effort would be better spent training paramedics to identify and treat patients rather than make them reliable on an outside dr. or a PA or RN who may have little if any more experience in the case at hand.</p>
<p>I feel this technology would be more helpful for those departments that have extended transport times, minimal resources in their area in respect to hospitals and especially specialized services and when paramedic evaluation is not available.</p>
<p>I feel this technology would have little effect on improving patient outcome. Seems more trouble than it is worth.</p>
<p>I foresee the difficult part of implantation of this technology will be questions concerning patient consent, HIPPA, is this technology used only on a specific type of incident, does this become part of the Pt's EHR, how do ensure secure data transmission, what is encrypted, how are videos or pictures de-identified.</p>
<p>I HAVE BEEN IN EMS FOR OVER 40 YEARS. I HAD ALWAYS HOPED THAT SOME DAY THIS TYPE OF TECHNOLOGY WOULD BE AVAILABLE. IT LOOKS WE ARE CLOSER NOW THAN EVER.</p>
<p>I have some concerns that the video equipment would be a distraction to patient care. A well trained EMT or Paramedic should be able to deliver pre-hospital care. There are rare occasions that assistance from a physician may be needed, but a simple phone call or radio contact should be enough to continue pre-hospital care. I feel strongly that we should concentrate on good BLS and ALS care and rapid transport to the hospital and not complicate it with more technology. There is usually already enough happening at the scene and generally we don't need another person in the mix confusing the chain of command.</p>
<p>I do think there is some info that is valuable to transmit ahead of time in cardio and stroke patients, and a snap shot of Mechanism of Injury can be helpful to a physician to determine the extent of injury.</p>
<p>I like high tech equipment but...it seems to me like this is tech overkill. We are trained in what we do and medical director voice consult works well for us when we need it, which is rare. Sorry, but it sounds like a whole lot of taxpayer money wasted.</p>
<p>I only concern is time taken away from patient care or interruption of patient care, areas of tower transmission is slow or not at all. this i believe best suite community medicine, and transport time over 30 min.</p>

I prefer a live chat between the EMT/PARAMEDIC and the ED/Physician

I really do not think this technology is necessary. EMS and paramedicine has gravitated further and further away from requiring that paramedics be competent. Training for paramedics has become weaker and weaker over the years. This technology can in some ways render some paramedic's knowledge base unacceptable because they will depend on this technology. Instead of requiring paramedics to be outstanding medical care providers we will provide them with a crutch that they may rely on too much! A potential problem with this will become evident when the technology fails. Additionally, sometimes we can have or provide too much information that will cloud or overwhelm the receiver's decision making ability. Also, in the 1990's there was a movement for paramedics to take instant photographs of motor vehicle collisions. This idea fell to the wayside because it was not really that helpful and served to become a wow factor for the ED staff instead of a factor in their decision making process.

I see great value in this system only if it is capable of transmitting 12 lead EKGs to the hospital. We currently spend \$8,400.00 per year on data lines to transmit 12 leads. We transmit ~125-12 leads per year and of those there are about 25 that are cardiac alert/STEMI. The time it takes to transmit the 12 lead is a minute or less. That equates to \$67 dollars per transmission, \$67 dollars per minute of use and \$336 per STEMI. This cost represents 25% of our annual EMS supply & equipment budget.

I see this as a really good option if used correctly, but one of the issues not addressed here is patient privacy.

In our area, we get calls from law enforcement to examine a suspect, or remove barbs from a Tazer, or calls where people have injured themselves, and some videotaping might infringe on privacy.

Would patients have a right to refuse being videotaped? Rape victims, etc?

Could this information be used by a patient or family member that requests it to start a case against the care of a patient? Who would have the rights to the video? All these questions would be a concern, mostly for patient privacy. Real time communications with a physician would be nice, but also, many hospitals are busy, and would there be someone available for communication with on-scene responders?

I strongly feel that this technology has a place in the pre-hospital arena. My only concerns is creating another avenue for the lawyers to use this technology to create additional frivolous law suits. If that could be prevented patient care could have an additional set of eyes in creating an accurate patient assessment and subsequent treatment modalities.

I think a better example of where video conferencing will be beneficial for patient refusals is the middle aged patient who has some possible ACS symptoms and a normal or near normal ECG who is refusing transport.

It will be very beneficial to have an MD try to convince the patient go to the hospital (they may change their mind and go), or in the event the patient still refuses and has a bad outcome later, it will be much easier to defend those who did the right thing in spite of the bad outcome.

Also, we are using this technology in XXX as part of our XXX.

I think for Trauma / MOI / MCI events, a video or photo would be highly beneficial to Medical Control. Trying to describe these events, usually to an ECRN, sometimes does accurately describe what we are seeing in the field. For Medical events, the EMS providers should be able to handle and convey over the phone. I do think that having direct video capability to Medical Control would be valuable. What I don't want to see is EMS crews having to face time with hospital on every call. This could lead to increased scene times and EMS providers only treating reactively, per a direct order, instead of proactively using established protocols.

I think it could be a wonderful resource to use in some circumstances to allow paramedics to truly advocate for patients in need, increase the general knowledge of what out-of-hospital care truly should provide for patients consistently, and provide a wonderful risk assessment tool for service administration. I do think that mandating long, difficult procedures that paramedics would be solely responsible for in a notably ever-changing environment invites failure. This technology could be wonderful for economically depressed areas but not as a tool allowing facilities to override EMS providers or require providers to comply with impossible criteria to activate services for a patient. There need to be clearly defined, uniform criteria for utilization of this service, as well as ways to address issues of system performance that can be agreed upon by all the stakeholders within the system- large or small.

I think it is very promising but then again a record of something can also cause trouble because then every move you make can be evaluated. You may not be doing anything wrong but it could be different than another person may do it and they see it as wrong.

As far as litigation, if you did something wrong own up to it before and bring it to patient/family right away video or no video.

Otherwise a great resource especially for the newbie medic.

I think it should be set up in a way to gain information, but not obligate a physician to monitor the patient during the entire transport.

I think overall this technology could be beneficial, but I also think that it is costly, logistically difficult to implement with privacy laws and the inevitable push back from field staff, and I worry that less skilled providers would use it as a substitute for provider development. (Though I suppose that is fixable wherein access to the resource is based upon medics *and* EMTs attending advanced training.)

I think that there are as many downsides as upsides and that in the end it's a cost/benefit. Is the benefit - limited, for my system, perhaps greater in rural areas with a longer transport time, and mostly for truly critical patients with multiple conditions and difficult situations (ie, 2% or fewer) - worth the cost - in time, training, legal fees, hospital education (to see it as a benefit rather than a burden)?

At the end of the day, I think that anything that gives even one more patient one more Christmas is worth it.

But we need to maximize benefit and reduce cost.

I think that live video and even recorded video would be very beneficial in many aspects of EMS care. I fear that it may be cost prohibitive for many small agencies or agencies with large fleets.

I think that this is the direction that we are headed in not just for patient care but also because of lawsuits. We have already seen this in the law enforcement side to cover them and their department.

I think that video technology is the wave of the future and we will be seeing more use of it in the next few years. It is a great way to handle patient consultation and to pass along the severity of an injury or vehicle damage to the ER personnel. However, it is only as good as the implementation plan and the support from the Medical Director/EMS staff at the EMS agency involved. There is no point in making a video or voice consultation if the EMS crew is not able to act upon the orders given. Also, I would caution using this technology as a "crutch." Paramedics should be highly trained and able to function without consultation except in those low frequency, high risk/unusual circumstance events. Having said that, this could add an enhanced level of care that is not common right now in prehospital care.

I think there are benefits to this. I have concerns that it may delay care if not used well. For the most case, I want video to help providers make decisions or to suggest treatments they may not have considered. I do not think this should turn into a "may I system" with having to get video permission for everything. Providers should be able to make good decisions if prepared well and provided good feedback on their care. Systems should have a good QA and educational system in place and this should be an adjunct.

I think there are times that this capability would be nice, and would be a helpful option to have in the toolbox, but I also think that it would stand to increase our exposure to liability rather than decrease it. Training to make decisions at the level they need to be made are what makes the system work well. Remote second opinion in certain cases would be beneficial, but I fear that in most cases it would be unnecessary and cumbersome with too much outside second guessing by someone who does not have the benefit of actually seeing the entire environment and flow of being there in person. We would like to remain as trained medical professionals with a job to do and a real connection to our citizens rather than simply a camera operator with guidance from another location.

I think this technology would be very helpful. I have a concern with the cost of using this technology. In rural areas such as mine, like XXXX we are a volunteer ambulance service. Our county doesn't have a lot of money to put out to obtain this service. In these types of rural volunteer services will there be state funding or programs to help with the cost.

Another concern I have is how does this affect HIPPA? Anyone could hack into the video feed and view. How will this protect patient confidentiality and privacy? How will worrying about video camera and recording affect the EMT's concentration on the patient? Will it make them too scared to touch the patient because of being recorded, or just to focused on trying to record and not focus on the patient while playing with a camera.

I can see lots of good with it also providing quick information to ER so they know how to prepare for incoming patient. Providing true record of incident if accused of something.

I think this would be a great tool to have especially in the trauma field. Like the accomplishments we have made over the past years with 12 lead ECGs the strip the doctor sees in the field allows doctors to make decisions on patient preparation and routing verses the telephone call from the medic to the hospital. Same concept could take place with trauma. Also in Mass Casualty Incidents it could cut way down on phone and radio traffic on the scene to have a link between command and hospital. I would be very interested in participating in such trial. Thank You

I think use of this technology would be very beneficial in our ED.

I think wearable cameras should be on all first responders.

I thought I had is some people act differently when on camera. If the video is of the EMS providers it may distract them from patient care

The thought of "big brother watching" every move the EMS personnel makes would add more stress to an already very stressful profession.

In my experience most providers can and do give accurate reports to the hospital ED or Medical Control. There could be special situations where the camera could help, but would a cost/benefit evaluation really make this technology worth the expense.

I truly believe that this technology will most benefit in the area of responder safety and accountability with documentation in video form of responses.

<p>I understand EMS systems are different. In my opinion, telemedicine is helpful with Mobile Integrated Health. EMS already has a system in place to treat critical patients and consult medical direction. I believe using telemedicine in a critical situation will take one person out of treatment and potentially delay treatment/transport of the patient. But with Mobile Integrated Health, paramedics can evaluate a patient with the physician to reduce readmits as well as determine alternative destination of a low acuity patient.</p>
<p>I understand the purpose of the technology but do not believe that there would be a need in all areas. I believe that more rural settings with limited resources would benefit more from this.</p>
<p>I wish we had it already I think it is a great idea.</p>
<p>I would like to see live video sent from the Emergency Medical Responders unit to the transport unit/ED that as long arrived time at incidents so medical direction can be given in critical scene.</p>
<p>I would say this should be a standard for any Community Paramedic Program/Mobile Integrated Healthcare from the pre-hospital perspective.</p>
<p>If this is something that can be implemented at no cost or minimal cost to us, then all for it. We are a small volunteer service, 250 calls a year. We would not be able to afford to implement this without some monetary help. We are rural provider, and at best the cell signals around here at times are spotty.</p>
<p>If we currently utilize in depth protocols and have over 500 hours of training prior to becoming licensed, why would this type of technology be necessary? This seems that it is taking the patient care decision away from EMS and having them rely on the Dr that is utilizing the telemedicine. I would not be in favor of anything like this for my department.</p>
<p>IF you're going to do this, I recommend live video. Take full advantage of the technology and the interactivity/feedback it provides or don't use it at all.</p>
<p>If/when we rely to heavily on technology, something will fail and something will be missed. Video tech should be focused on extended transports in areas with limited resources, and specialized fields like community paramedicine.</p>
<p>image capture technology would be extremely useful in the confirmation/documentation of ET tube placement in the field. Visual documentation of a tube passing into the trachea, and/or ability to re-affirm placement with serial pictures would be useful.</p>
<p>Images and especially video should not substitute for proper EMT/paramedic training and good system design. A paramedic should be able to triage a scene at least as well as a medical control physician, and frankly probably better; video or still images will only interfere with this. Delving for a problem to fit a solution someone has already invented (e.g. possessing a technology and then trying to find applications for it) often leads to excessive use of technology with the often high costs that entails. One would be better off using this money and time to better educate the paramedics in a given system to do the job they're supposed to do, which is to be thinking, reasoning medical providers within the framework of protocols they have been given.</p>

imaging has always been thought to be a benefit "a picture is worth a thousand words", but in today's world of social media and it's abuses, taking images on scene has become a "take a look over your shoulder" before you snap or shoot scenario.

In addition to live and/or recorded audio and video communication, I would also like to see live transmission of data from monitoring instruments (ECG monitor, oximetry, capnography, vital signs monitors, etc.), and treatment data captured in the electronic prehospital care report software (medications administered, electrical therapies, etc.).

In no way do I wish for telemedicine to decrease what an AEMT or Paramedic can do in the field. It would be best to better equip and train them than have them just follow directions from someone miles away.

There are going to be times that physician consult would be beneficial for all people though.

In one sense I am a strong proponent of HIGH QUALITY video for telemedicine, recognizing its shortcomings in such things as coverage areas and reliability. Rural coverage will be an issue, just as today there are many areas without cell phone service or reliable radio comm. Similarly, Hurricanes, ice storms, floods and etc. tend to lead to system failures just when the demands may be greatest. However, this questionnaire seems more an attempt at justification and a cheering section than real data gathering. For many things there is a clear distinction between having video, and having it remotely and immediately available, and this questionnaire doesn't make that distinction. Also, there are already issues with information overload, and in many cases simpler is better. At a MCI, an ED doesn't need to see a whole event if they are getting 5-10% of the patients.

In theory, i understand ways in which this would be helpful. we tried this in the past, i found it to be just too much to do, while trying to treat the patient, do my charting, call the hospital, etc. i think in the months that we did it, i took one picture from a car accident. When i showed the doc, he was barely interested. It didn't end up feeling very beneficial to me.

It appears that there is a lot of focus on Cop Cameras. I think there will come a time that every paramedic will have to have a camera to support decisions and support their actions. There are more and more complaints that are unfounded. It is a shame we are coming to a society such as this need. Medical application for consultation is a great idea but must be affordable for agencies to be able to use. Funding is the biggest issue.

It appears to be more of a burden than an asset. A well trained EMT with a functioning voice communication system is adequate.

These video communication links/consultations would be time consuming and reek of "Facebook Likes and dislikes" and will cause an EMT's critical decision making process to deteriorate by forcing them to run every decision through a higher level.

Spend your money on quality training rather on technology, as technology has a tendency to fail when needed most and, in the area I respond, will likely not work due to connectivity issues over a large amount of the county

It is a promising technology and despite my answers, I think there is a role. My fear is that micromanagement, lack of trust, and incapable providers will make this seem appealing. It will set paramedicine back 20 years.

This is a small step from the medic medic concept that has not proven to benefit outcomes, increases provider inability to do the job, and creates fear in patients. I hope that we learn to use this technology well and don't turn it into virtual well.....

It is essential that medical control rest with an operations or ER physician dedicated to this job and only when needed with advanced techniques, questionable medications, MCIs. It would be highly disadvantageous to have this technology and simply ask an available nurse in the ER to communicate or direct paramedics in the field.

It is imperative that cybersecurity be addressed adequately in addition to patient privacy policies and procedures. It is advisable that all equipment used for this purpose be EMS agency- or hospital-owned. No personal devices should be utilized.

It is important to recognize other levels of EMS that exist in Idaho rather than just paramedic services. This type of technology would be even more important in rural areas with QRU, basic and ILS services.

It needs to be relatively inexpensive if it's going to become the standard of care. The state often makes mandates for this kind of thing but provides no avenue for funding the changes. DON'T FORGET ABOUT THE TRAINING CENTERS! Training centers should also be eligible to receive funding for this type of equipment to teach during initial training and continuing education courses.

It needs to be simple to use and convenient, or it will not be used by field crews

It's not pertinent or worth the money for EMS to use this except for viewing a training. In this case it's pretty cheap to use the internet and some basic AV equipment.

Just having good cell contact would be an improvement in our area of northern Wisconsin

Just like law enforcement will have EMS needs body / helmet cams for quality control and to project what we see to the physician. Not all medics and EMS personnel are capable of providing a clear verbal picture via phone or radio. Many problems with EMS staff getting out of hand over treatment / under treatment the cam would aid in training and also as a reminder to staff that they are being recorded by just placing a drive cam on ambulances a great reduction in our accidents and untoward actions our department would be glad to demo a device we are a poor county in XX a triracial community ranked XXX for worst health in XXX largest Native American group east of Mississippi sorry about one large run on sentence was short on time XXXX Director, XXXX County EMS(8) years 27 year Ems professional

Like I said in all these comment boxes, this may be a good idea but bad in the sense that we would be violating all privacy laws by taking pictures and or shooting video's. I can't think of one time over my 25 years where sending the ER a picture or a video of what's taking place in the back of my ambulance would have benefited patient outcomes. I think your flirting with disaster the first time some bone heads post stuff to YouTube.

NO NO NO
Live video is sexy. But I do believe there is greater "bang for the buck" in simple pre-hospital telemetry. An electronic means to notify the receiving hospital as soon as a transport decision is made (rather than late enroute via voice CMED). This would include basic patient demographics, presentation/vital, and treatment.
Again, I see a great role for video in Community Paramedicine interactions.
Live video is the preferred technology.
Looks like this is the way the technology is moving and I am thinking it might be the best even in a court case.
Many EMS providers will be scared of the use of video against them in legal cases. Reassurance is needed that shows that these technologies will not be used against them.
Many more uses available. Need reimbursement for decisions made using this technology.
Many rural areas would need to increase/modify on-call use of Medical Directors to maximize effectiveness of technology.
May be useful for: Complicated labor and delivery Neonatal resuscitation
Maybe more trust needs to be placed in the "lower levels" of EMS, instead of trying to make them into a "camera crew." First responders have been trained to deal with emergencies in the field. I think that EDs can prepare adequately based on the report called in by the ambulance crew. We are usually "off line" in our area of service. We also choose from 3 hospitals as to where we will transport. I cannot imagine imagery being useful in our situation.
Medical control physicians would rather not answer the radio, let alone spend time watching a video!
N/A
New technology is great, but at some point, we are going to run out of time to get things done. Cost of equipment needs to be considered as well as HIPAA.
Is there actually a "problem" with these various topics, or is it something people think will be nice since the capability is heading in that direction? We have a difficult enough time just getting a physician to talk on the radio at from the ED, I can't imagine them stopping what they are doing and looking at video, pictures or even live events.
no
no
no
No

No
no
no broadband infrastructure that will support this, what's more who is going to stop patient care to capture and send a video and who is going to pay for the equipment IF we were ever to get broadband that would support this
NO NEED for this technology when Paramedics are properly trained
No, thank you
None
Not at this time.
Not beneficial. Waste of time. As with past telemetry and photograph efforts, provided for the morbid curiosity but never changed or enhanced patient care, patient flow, etc.
And where do you suppose all the videographers are going to come from?
Our Regional Medical Response Team has just enacted this technology in our Disaster/MCI setting when our team deploys. Using this technology we can setup video conferencing between a remote physician or specialist and our team that is deployed into a remote/austere setting. This better enables our team members and even our team physicians access to the range of specialists our brick and mortar facility has to offer. Therefore allowing our team to better assess, treat, and determine the proper destination of our patients.
It also will allow us to stream or send live auscultation of lung sounds, heart tones, etc. using a Bluetooth stethoscope. The receiving physician can interact on the screen by showing the remote provider the location he/she would like to listen to.
This capability will also allow Hospital Incident Management to have streaming views on the scene on the ground. They will be able to see the victims, the destruction, and the chaos allowing a common operating picture!
Perhaps I'm old school but as a paramedic and an EMS administrator, I think paramedics can be trained to make decisions and protocols are designed to guide those decisions in emergent cases. Video consults in here would delay care and would not add appreciably to treatment. This could be useful technology in mobile health care or community paramedicine situations.
Possible benefit on longer transport. Favor simple transport with well trained personnel vs technology.
Potential to be an asset for patient care and possible improved outcomes.
Purely my personal opinion....Has the potential to distract from actually caring for the patient. It likely has its place in certain scenarios and environments but not an everyday use. I see its utility from a risk management and quality improvement perspective more than anything else.

<p>Real time, live video allows the best information exchange and the least chance of misinterpretations.</p> <p>We are currently piloting scene access to patient medical records. Such access allows field personnel to learn of significant PMH and allergies.</p>
<p>Scrupulous attention needs to be given to the realistic workload for the paramedic crew and ED staff. Most EMS calls are managed by 2-3 crew members and a critical patient will involve their full attention. Because of this, any video/telemetry solution must be near-automatic and not require more than a few seconds of user attention.</p> <p>The other reality is that the ED provider is often caring for a number of patients simultaneously and may not have time to spend with lengthy video communications.</p> <p>I believe the best use of this technology will be for risk mitigation and community paramedicine, where the medics act as the hands of the treating clinician, supported by live video feed. Paramedics are smart for sure, but community paramedicine/home healthcare is not their strength and they need some physician/PA support to execute.</p>
<p>Showing crash scenes, damage etc does not translate to a change in patient care...its technology without a subsequent intervention.</p> <p>Patient physician interaction or patient physician with medic collaboration IS helpful. I use FaceTime now with refusals and MIH patients and find it extremely helpful.</p>
<p>Situation awareness being broadcast to field supervisors/incident commanders and regional communications centers would help to create a common operating picture for resources and additionally could be used to document incident command process at large scenes. Being able to capture still images for records such as patient location/ID during large scale incidents would be critical for identifying patterns of injury, investigations, and ultimately notifications.</p>
<p>Some are better at it than others.</p>
<p>Specific attention needs to be made about whether or not video or picture imaging will change patients care. I would caution against using the technology for the simple "wow" factor versus taking pictures that would alter destination decisions or patient care choices.</p>
<p>staff would need to know that it is for patient care and not surveillance of them, and it cannot be turned on remotely only be staff on the truck</p>
<p>Technology for technology's sake, takes away from patient care, but at least the salesman will get a big commission. Courts of law have proven time and again that eye witnesses are not always accurate witnesses. A gory picture can be a fun, voyeuristic interlude but, small cuts bleed a lot, parlor can be caused by an MI or car sickness and critical patients need an attentive Paramedic, not paparazzi.</p>
<p>Technology has promise, but more for extended scope of practice and risk management. In a setting with dedicated medical control physicians (those with no clinical responsibilities when manning medical control), there could be more use.</p>

<p>Technology is a great tool that needs to be used but it needs to have a strong set of guidelines and a well-tested method of delivery in a safe manor. Various amounts of testing needs to be done at various locations from rural to urban to test all of these components of the system or it will be like other technology something invested in but not used on a consistent basis.</p>
<p>Telemedicine has a place in rural EMS and Community Paramedicine. On the scene of a call there are too many other items that need to be addressed instead of dealing with video connections. Military had looked at this in the past. My want to see how their program went.</p>
<p>Telemedicine is a tool, not a toy. My fear is that we use this tool indiscriminately and it takes away from patient care by delaying treatment and care. It can also be distracting for the EMT and med control. I think it would be valuable for QA and training. Question 1 can have more than one answer.</p>
<p>Telemedicine technology would be beneficial especially in a rural setting. Competing priorities for financial dollars is a barrier not only in EMS but also in the hospital environment.</p>
<p>Thank you for the opportunity to assist in this questionnaire and I hope my responses and comments are of some assistants to you.</p>
<p>The availability of adequate signal in mountainous terrain will be an important factor in determining whether the technology will prove useful in our area.</p>
<p>The issue is and will be how does or will Telemedicine enhance better patient outcomes. I can see that we could get carried away and demote the assessment and treatment abilities (back to the "Mother May I" time) rather than enhancing the ability to confirm the Prehospital providers assessment and speed up the treatment process by by-passing the ED or leaving the patient home. It always comes down to how and when to best use the technology.</p>
<p>The lists seem to be in an order of most to least desirable, (which probably answers most of the questions). Then as with most things it comes down to money and how do you get to the best case scenario. Probably incrementally over time.</p>
<p>The more eyes on the patient - the better!!!!</p>
<p>The only issue I think can happen is the video/pictures are released to the media or family members that could violate HIPPA laws</p>
<p>The possibility of this type of technology would be great as long as it does not interfere with the EMT/medic on scene and the job that needs to be done. I would hope that we would not delay or minimize patient care while we are trying to get this technology to work or wait for the physician to come online.</p> <p>I see the potential of losing critical thinking skills and assessment skills because we will be bringing the physician to the patient and letting them make the call(s). Right now, I see in the current EMS system, new EMT's of all ranks, lacking in these skills when they finish their</p>

training and I think that this would just add to that.
Telemedicine does have its place. It will take a while to figure out how best to use it.
The question that always comes up is "what is the cost to the hospital?" in using or obtaining this technology.
Sounds like a great idea!
The systems that support the live interactive video require an increased cost to ambulance operations with no proven improvement in productivity or patient care. Further the expansion of technology has taken the "hands" of the responder away from the patient.
The technology is great; the problem will be getting the physician's to consult. They are busy with patients and other things and in conversations locally it has been about do they get paid for those consults?
The technology seems better for a department with a longer transport time. Our department is typically on scene for less than 10 minutes and transport is between 5 and 10 minutes. It seems that trying to use the live video feed would lengthen those times. In a longer transport scenario I can see where it would be beneficial.
The technology would have to be super simple to operate and fix on the fly if technical difficulties are encountered. The technology would have to be cost effective for today's budget constraints that most Fire & EMS agencies are faced with. Or, make available EASY to acquire grants. Assistance providing the development of guidelines and procedures for agencies.
the technology would need to be affordable for services to utilize it. This should not be forced or consider as a litigation prevention (like police are dealing with now; dash cams weren't enough, now body cams are being required) ED's are generally busy, and understaffed; If the purpose is to provide scene exposure and assistance from the definitive facility, then how will this physician component be put to use? A Doc just to watch a video call console, while others are seeing patients...lots of in-house trials and battles of power to sort this one out.
The XXX did still imagining and video feeds 20 years ago. Funding was a key factor. Since the cost reduction and bandwidth have improved this may be the opportune time. XXX was a lead person in this endeavor. Contact me and I will try to give you more contacts if interested.

The use of these procedures would be very beneficial for presentation to the ER physicians. I cannot tell you how many times I have documented CVA symptoms, for example, that begin resolving after the helicopter picks them up, which leaves the receiving facility wondering why we decided to fly them to a higher level of care rather than keeping them local. Also, being able to actually SHOW the kinetics involved with traumatic injuries would give the ER physicians a much better idea of mechanism, rather than our verbal report alone. I do, however, wonder how we, as EMS Providers, could remain HIPAA compliant with this technology?
Thank you,

There are far better uses for these technologies than those listed. "Live feed from wearable camera?" Please. What a nightmare. On-scene times would double or triple, getting a medical control physician to be reliably available would be dubious at best and use of "high-speed connections" is nothing more than a pipe dream in a rural area that doesn't have cell service in a good portion of the county.
We would be much better served by using this technology for reliable distance learning solutions.

There are many indications for tele-medicine with EMS. A future CMS indicator would be for quality of care and reimbursement.

There is no mention of the ability to send continuous EKG, invasive or non-invasive vital signs monitoring which can be a valuable tool in an advanced scope of practice scenario.

There is no substitute for the visual assessment of most situations. Regardless of medical, trauma, specialty care or MCI any and all modes of video or pictures could have a positive impact on outcomes. As we see with PD risk management issues, EMS will be the and should be the next to video their encounters to back up their documentation and actions.
Rural and remote areas need this technology more as medical consult and direction would benefit the patient and the outcome.
One key factor is the CQI and security of the system. Any vendor and EMS system will need to ensure these tools are treated the same as any other protected patient information.

This is exciting technology. I wish we could help evaluate this technology.

This is not a panacea, while potentially useful in certain very specific situations this will be another demand for the limited attention of the physician. I see it being most useful for community paramedics and high-risk refusal situations where the benefit of the consult outweighs the negative of additional demands on the most limited resource in the EMS system, the physician's time.

I fear the implementation of live video consulting will tempt some physicians to attempt micro-management of the personnel in the field. Many of the issues described in the questionnaire should fall under core competencies for the field staff, be they paramedic, EMT, supervisor, etc.

This is so new that we likely won't fully appreciate the uses until we actually implement.

This is useless in a rural area with mostly one EMT and a driver with no internet available.

This opens huge potential for hospital and pre-hospital, however I foresee many unintended consequences. The temptation would be great to over control field providers, local governments would see it as a way to reduce cost by lowering the level of care provided ALS to BLS, in my system the walk in patients to the E.D. overwhelm the limited staff, you can barely get a Dr. for consult let alone a video consult. I can see advantages to critical care and major trauma.

This technology has a place but I believe it is unnecessary and perhaps even impractical for the majority of runs. First responders are often with limited personnel resources. The physical act of taking and transmitting scene footage will take someone away from patient care and possibly increase scene time which we are constantly trying to limit. Will the additional information alter patient care on the scene, during transport, or significantly affect preparations to receive the patient at the destination. How many instances are there that video or images will surpass a standard voice report and change decisions that may otherwise have been made? Our department's transport times are very low (5-10 min typically). We currently fax in 12-leads which rarely get looked at before arrival. I do see the value of an ER physician consulting with a patient to determine if a release/refusal is appropriate or to dictate care in unusual circumstances with extended transport times.

This technology in theory is wonderful and would more than likely be beneficial to a large number of the EMS working population. However, coming from a small rural community with a decent size response coverage area, I do not feel it to be feasible in our area. The set up and maintenance costs would be astronomical for our small volunteer department.

This technology is attractive on its face, but before it is implemented in the field, there should be strong, clear evidence that it improves outcomes. I'm skeptical about its value and concerned that it will become a standard expectation of EMS like other unproved interventions from the past. My skepticism stems in part from many years of experience in training and practice. In general, if an EMS provider needs to be told what to do; you can't trust that provider to perform that intervention properly. There are certain times when on line medical consultation can be helpful, but they are uncommon and it remains to be seen whether video will make a difference.

This technology is coming. It is the logical progression of EMS/medicine in general. Cops are already using it with obvious results. Good or bad, the unblinking eye of the camera doesn't lie.

This has real potential in expanding the scope of practice of the EMS professional, and makes excellent use of technology to bring a physician to the scene, to be involved from the outset of the emergency.

It also has very predictable legal results. Patients and providers sometimes don't see everything, or notice it, or tell the truth. Having the camera rolling, and a physician involved will certainly have an impact on the outcome.

My question is simply this; Funding.

Who will fund the front end, and how will we convince the Hospital Systems that paying a physician to "watch TV" is a worthy investment?

This will happen eventually, whether we are in on it or not.

I choose to be involved in any way possible, and hope that is hugely accepted, and successful.

This technology is exciting but not appropriate to our service area. We have no cell service in XXX county and would need to depend on using satellite telemetry.

This technology may allow, with a physician in the dispatch, to help paramedics to make a no transport decision, in particular for old people in retirement homes

This technology would be a definite benefit to patient care in both the pre-hospital and the ED if used appropriately. There is the concern that video might become public or posted on social media. Regulatory issues of medical control should also be addressed to cover the physicians on providing telemedicine service. Also this service might be billable.

This would be helpful particularly for stroke patients and in viewing questionable EKG's for stemi.

This would be prohibitively expensive and would be a significant financial burden for the EMS department/cities of off-the-road-system, rural XXX.

Though video clips may present the same set of images to receiving parties, it requires the paramedic to do yet one more thing... and consequently, it may not happen as often as if a live video stream was standard operating procedure. That way, the images are being sent, and presumably stored as well, without someone needing to go through extra steps to identify and 'transmit' the video clip.

Using it now. Have difficulty with Cell coverage and there is no payment model so the technology and ongoing costs are expensive.

Very good for stroke patients, the doctor can perform a NIH Stroke Scale to develop a trend from onset of symptoms.

Will allow for ED staff to see and understand the living conditions of the patient which may assist in social worker consults and chapter holds.

Allow for minute to minute changes in MCI scenes and allow for proper resources to be advocated.

<p>Very supportive of Telemedicine and believe it could provide many important contributions. However it is essential that this serves EMS as a tool and not get morphed as a weapon that will be used to punish people. A just culture approach is essential.</p>
<p>Video is valuable in situations where there are many choices so the decision-making is all "gray". When there are already well-developed criteria or easy-to-understand judgements that assist with the decisions, then video/picture is unnecessary. While having a photo or short video might peak certain individuals curiosity, unless there is a patient treatment or destination decision to be made, these technologies will not help.</p>
<p>Video should be a standard documentation technique, with audio. should not require extra work for field personnel -- for example a wearable device could be activated during patient care and edited by other staff after then end of the shift.</p>
<p>Waste of time and money. EMS crews need to be less tethered and more independent. We are becoming increasingly technology dependent and the technology is not yet there.</p>
<p>We are a Critical Access Hospital with only two 24 hour ALS units and a federal grant to help fund this project would be the only way a small rural service can afford such technology</p>
<p>We are currently exercising this technology; however, we are using XXX Wireless 4GLTE Band Class 13 at this time. So far it has been a success....</p>
<p>We are currently having video cameras installed in 4 of our transport vehicles. Included with the cameras will be exterior cameras. It will also provide video of our response to and from the scene/hospital. This is good should the vehicle be involved in a accident or other event. Also, consider guidelines on record retention.</p>
<p>We are currently looking for grants to fund EMS Telemedicine camera system</p>
<p>We are currently testing a low-cost, iPad-based mobile video consultation system for ambulance transport in the acute stroke setting of rural central XXX. The study, titled iTREAT, has completed feasibility and is IRB-approved for live patient enrollment. If an opportunity exists, we would be interested in participating in a focus group on mHealth applications for EMS transport, particularly focusing on rural areas. Thank you. XXXX</p>
<p>We are fortunate to have two trauma centers, a stroke center and a Children's Hospital all within 20 min of our response area. My comments I tried to look at all area and not mine alone. I hope this helps.</p>
<p>We are looking to implement image sharing and data transfer between out 3 Hospitals and Clinic and looking at the options for EMS.</p>
<p>We are trying to implement a body worn camera program in our system but are running into much trouble in the legal/risk/privacy areas. We need support in these areas to move forward efficiently. I suspect that most people believe that video footage provides excellent documentation and communication, but we get hung up on the non-clinical issues. I would suggest that part of this project should speak to these issues. I would be happy to join your group and help with this project.</p>

<p>We cannot count on the Cellular network. There is too much system vulnerability during adverse events; weather, terrorism, etc...</p> <p>We need an enhanced radio system, a comprehensive MED Channel system, utilizing all 10 MED channels with repeaters to be able to speak with hospitals. Voice recording is also critical. Portable radio communications needs to be from the patient's side.</p> <p>We are transmitting 12-lead EKG's via Cellular modems and this has worked well, but again, I have concern about a communications infrastructure during adverse events.</p> <p>There should be a National Communications Standard for all Emergency Departments. In XX we continue to use VHF hospital frequencies shared with School Buses.</p>
<p>We currently have multiple options to send telemetry or communicate with Ed physicians, all fail due to time constraints, lack of accessible technologies in the ED, and physician reluctance to utilize these systems due to lack of familiarity with the technology. If this system is to actually make an impact, I feel it is vital to incorporate three ideas.</p> <ol style="list-style-type: none"> 1. Accessibility, ease of use and light learning curve for facility providers. 2. Strong regional endorsement- standardized, protocol based establishment of the system. 3. Financial affordability- EMS systems struggle to maintain as it is, new technologies tend to be expensive to implement and maintain, with no foreseeable return.
<p>We do not see a clear use case for technology in most of the scenarios above. Telemedicine should not replace high quality training and active quality management at the EMS system level; the scenarios where telemedicine is useful in the field are few and far between. Most/almost all EDs lack the capacity to dedicate anyone to a telemed service for EMS, anyway.</p>
<p>We do not see a need for this technology. Pre hospital care focus is on patient stabilization and the patient's needs. Ambulance staff is qualified and trained, any other intervention via Med Control or Dr. can be achieved via LMR voice</p>
<p>We do not want live or still pictures transmitted. We call medical control who is always available.</p>
<p>We get so few calls in XXX that I would love any extra opportunities for additional real life training events....</p>
<p>We have found, in EMS, HazMat, Technical Rescue, etc. that there is a fine line between using video.</p> <p>The concern is the balance the need to get additional information back from the field for decision makers, but to prohibit decision makers in the rear from trying to direct units in the field - kind of a one-way flow of information.</p> <p>For our operational environment, we train to, and need to trust the capabilities of our responders.</p>
<p>WE HAVE PLANS TO PLACE APPLE I PADS IN EACH UNIT FOR MAPS AND FILING REPORTS.</p>

We hope to be in a position to take advantage of this technology. Currently, we are currently working toward this capability by rolling out traditional telemetry with our Zoll X-Series monitors and Motorola vml750 modems. The modems and XXX network are apparently not ready for prime time yet. We are hopeful that FirstNet will improve the offering greatly.

We need low cost off the shelf solutions that cost little to nothing to implement. High cost hardware solutions are a nonstarter. Apps (cross/multi-platform) and other software solutions for utilization of existing equipment is essential.

We need to get the balling with all trauma centers in the USA

We need to trust our EMS providers to act without direct oversight. IF we cannot then we need to raise the bar to obtain certification.

What cost would be involved and what kind of signal would be needed in order to communicate?

What technology platform will be used to receive the information in the ED/hospital setting? Will consideration be taken to understand how this impacts other emergent telemedicine care models already being utilized? How does this impact EMS in rural villages who may not have the level of connectivity needed for live video feeds. How will providers and EMS staff receive training and equipment?

While pre-hospital 911 support has its advantages, home health care is going to be the leading use of this technology.

While support for field paramedics via video or imaging is important so is training of paramedics. With a robust paramedic training and paramedic training maintenance program the use of streaming video or imaging technology would be minimal. There are instances where this video and imaging technology would be extremely valuable. Not looking to downplay its value but there are many considerations to be reviewed before implementing streaming video or imaging from emergency incidents. First and foremost is the updating of state and federal laws to severely restrict access to any streaming video or imaging to the medical professionals and paramedics only unless there is exceptionally compelling reasons to release that streaming video or imaging under open records laws. Perhaps a strengthening of the HIPPA laws to encompass new technology is appropriate.
Food for thought.

While the tech side of things is advancing and making great strides, so is our education of providers.
Most of the options presented here are showing a step backwards in the trust of field personnel and what they have been trained and taught to do in the field.
If the ability to provide advanced scope procedures were considered that would be a better use of the technology. For example, if a service with an extended transport time were able to administer TPA after consulting with a neurologist to save brain that would be a good use. MIH, CP, or remote medicine would also be a great use of the system. Day to day pre-hospital systems would not be a good use of the technology.

While there are many benefits, we also need to be cautious to not become too reliant on technology. We still need to be able to perform when it fails.

Will improve patient outcome at all levels of treatment----load and go has no place in field medical support in 2015. Technology will improve patient outcome and it begins with NG911 and EMS field staff. We have an opportunity to make a major leap in patient field care that will improve outcome and quality of life for people.

You need to remember that in some remote locations even Cell Phone service is not available and internet is nonexistent. Our EMS area is 450 Sq Miles and less than half has basic cell service. These are also the areas with the longest transport times. Air (Helo) is at least one hour from liftoff to arrival at a trauma/STEMI/Stroke center and if the aircraft can't fly it's 90 minutes ground to any hospital and that may not be a "Center". Technology is great but it only works where there is infrastructure to support it. (PS: Can't afford Sat Phones)

**APPENDIX C: Full Text Responses Video Capabilities Matrix
Telemedicine Physician Medical Director – General Comment**

12 lead EKG's directly to ED and STEMI Team so from field, by-passed directly to cath lab. Speeds up assembly of cath team and opens up an OR Also, video of special situations. patient crush/trapped for extended periods (crush syndrome)
a most beneficial use for Community Paramedicine home visits.
after talking to Medical control; will help Medical Control with all the above
All are applicable if the technology can be applied in a way that is compatible with prehospital workflow
All of the above fields would be beneficial because in EMS there are always gray areas. And it will provide a better relationship between hospitals and ems.
All of these are wonderful ideas
As a paramedic, I have been making decisions within my scope of practice and under the guidelines of my SWOs for 26 years. I do not want to be involved in "mother may I" medicine.
As an agency we are allowed to call death, refuse patients, and treat with standing orders/protocols. The hospital and ED has limited staff and one Dr. Seeing many patients. Simply put there is not enough time for routine calls such as a diabetic or cardiac arrest, however there is great benefit to STEMI, Stroke, major trauma, and MCI's.
Can't think of any instances where a video over a cell picture would be beneficial. However, we do have some areas in our jurisdiction where there is NO cell service coverage (too rural) would a video transmit where no cell could?
Community Paramedicine is fast gaining ground, with benefits to the community, EMS and Hospital resources. A strong team approach incorporating Medical control is vital, I see video communication as an excellent way to develop this team based care.
Could be beneficial with the use of ultrasound.
Critical care in our system is interfacility
Difficulty will be in keeping the base physician away from patients longer to view video. Base contacts are now routinely handled by nursing, with physicians within ear shot of base to provide orders.
For our area transport time is to short to attempt connection and transmitting of video/pictures

<p>Good theoretical ideas.... These concepts are dependent on physician availability and the abilities of the EMS providers in the field. I can see rural volunteers not being able to make the technology work when needed due to their low call volumes.</p>
<p>Having medical control available to view pictures/video will also be a challenge, so using them as a crutch to make time sensitive decisions in the field may not be the best thing all the time. We don't need someone looking at a computer second guessing treatment/transport decisions, but can use this when the situations are rarely encountered and we would call anyway.</p>
<p>I believe all of the above have some valid benefits for field providers.</p>
<p>I believe medical control has no role via tele medicine. Protocols are in place for a reason. I see this going back to the days when EMS had to ask for everything. A well-educated paramedic can have a conversation via phone if he or she needs to consult with medical control. So, my choice is none of the above.</p>
<p>I do not believe we need medical control to help with termination of resuscitation in the field. Refusals or leaving patients on scene would be a much better use of medical control.</p>
<p>I feel field EMS Personnel should be qualified enough to forward the correct information without the cost of expense video equipment.</p>
<p>I feel that in an extreme emergency setting that video based medicine is not needed. I do believe it would help with the determining how non emergent medical problems could be treated in the field.</p>
<p>I have only called medical control one time in 31 years, and that time video might have been useful for him to see how violent the patient was in terms of danger to transport.</p>
<p>I never hear prehospital stories from EMS coworkers saying they need MC for decision making. They rarely need approval for a therapy. 99.9% of the time it is to document a refusal for liability purposes. However I think it would be great for community paramedicine and patient interaction</p>
<p>I see no real benefit of using either video or pictures for pre-hospital and it opens up a whole can of legal worms.</p>
<p>I see one of the most valuable potential benefits as the ability to consult with specialty and sub-specialty physicians.</p>
<p>I see the principal benefit in the assessment of conscious medical patients</p>
<p>I think one of the biggest advantages would be in the community paramedicine realm</p>
<p>I think prehospital providers would have a much better perspective on many of these situations than an ED physician. Possibly a goods concept in some areas, but I'm not sure I see an across the board need.</p>

I think that any type of video telemetry is a bad idea. We are patient advocates and one of the most important areas we need to protect is dignity and private. We should be skilled enough to be able paint a good enough so that ER personnel have a pretty good idea of what coming. Images will do nothing for the immediate care, nor will it change what happens when we arrive if you've done your job. I believe that you're opening a big box of trouble when you allow personnel to start snapping picture

I think that there are very few instances where video streaming is actually beneficial, and worry that it would be overused and used as a crutch in place of skill development. However, it may be useful for the patient with multiple complex issues (MI & ICH), patients with rare diseases difficult to see in the field (Alcoholic Ketoacidosis). I don't think it will improve modality decisions -- the average ER physician hasn't been in our shoes. Perhaps in an rural environment it would be better.

I think that video is a great tool, but is too quickly going to turn into a crutch for those that are not strong in their craft. This will make providers even less responsible for care and be detrimental to patients.

I think what we are seeing here is time away from the patient and pt. care. Immediate transport is more important in most cases.

I was surprised that CVA's were not listed.

I would like to see this used for those questionable calls where the paramedic wants a second opinion from a higher level of care such as a nurse practitioner, physician assistant or a physician.

If video it would need to be mounted on helmet or in ambulance, as there are times it is difficult just to get a photo.

The decision that may benefit would also be the problem. Are you basing all your treatment on what medical control is advising or using protocols established? Will medical control always have time or will they be too busy at times.

Working as an effective team would be the key, otherwise second guessing and slower care will occur.

In this area Paramedics have standing orders that vastly give them decision making authorities. Other than the case of MCI, biological, entrapments, agricultural incidents, crushing/compartiment syndrome situations I'm undecided at this time the advantage or benefit the electronic communications will actually give or that it may be more a hindrance in the day by day operations? I am interested in seeing the studies and case work.

Logistical benefits should be weighed heavily, oversite on care is ok, and however the EMS worker should make the final call on site, NOT a doctor 15 miles away.

Make sure medical control is a physician and not a nurse

<p>Many large metropolitan cities that I am aware of have good protocols or good medical control that has been or are being vetted to a point to where they are working well for that system. Therefore, on the average or typical 911 call I feel the photo or video imaging would of little benefit or help to the receiving physician or for that matter the patient. Many busy city receiving hospitals may be just too busy to view these "routine" 911 calls. Just my thoughts...</p>
<p>Many of our paramedics have as much/more experience than the receiving ER doctors - we work with a med school/training hospital, and have very senior medics.</p>
<p>Many of the areas I respond to have no or little connectivity. The proposed system would have minimal value</p>
<p>Many of these decisions are made quickly and are part of a rapid flow that is pre-hospital emergency medicine. The delay in establishing and utilizing this type of process would, in my, opinion is cumbersome and would slow the process in most cases with little added improvement in the outcomes.</p>
<p>Medic skill sets could be extended, enhance H & P of the patients.</p>
<p>Medical Control in our area is limited. Most receiving ER Physicians are not involved with initial Pt. radio report. Radio reports are received by ER nursing/tech staff. Medical Control is very rarely involved with scene decision process.</p>
<p>Medical Control should be an adjunct to field provision. We must have our providers trained to a competency level where they can provide a level of care that is enhanced by medical Control.</p>
<p>More/Tighter medical control over paramedic actions in the field would, for the most part, be a huge step backwards.</p>
<p>Most critical care treatments are covered via standing protocols. We don't have enough people to also take photos/videos when we have life-saving interventions to perform quickly. Nor to ER docs have time to watch video and provide constant feedback when they have multiple other pts they are caring for in a busy ED.</p>
<p>Most of the time our local medical control trusts EMS providers to make the right calls. Occasionally they refuse an order for a medication or an order to discontinue resuscitation. Our STEMI and Stroke care are spot on and we're trusted by the local hospital EDs.</p>
<p>Most of these options take us back to the 1970 when there was no trust between the doc's and field providers</p>
<p>My training covers all of the above. At what point am I expected to stop my patient care and play with the video camera? This has all the ear marks of technology for technology's sake, NOT PATIENT CARE. The last time something time something like this was tried proved that. Crash help was no help at all, this seems more suitable for hospital to hospital than field to hospital. A picture CAN be worth 1000 words but that doesn't mean the words are accurate or necessary.</p>
<p>No benefit</p>
<p>No broadband infrastructure that will support this</p>

<p>Not beneficial. Waste of time. As with past telemetry and photograph efforts, provided for the morbid curiosity but never changed or enhanced patient care, patient flow, etc.</p>
<p>Paramedics need to be trained to be autonomous. Despite the benefits of new technology there are always connection or time related issues. The "phone-home" approach was tried in the past. If you can't trust your EMS personnel to operate without a physician watching them on a video screen then you need to increase the threshold to obtain a certification.</p>
<p>pre-hospital personnel are already trained in non-video-assisted triage/treatment/transport protocols. Unless there have been national/multi-state multiple documented improper decisions providing an impetus for this direction, it should be avoided. Moreover, an ER nurse usually answers pre-hospital provider telemetry calls. Further, if there is a need for advanced, routine tele-medicine communication, then pre-hospital personnel training needs improvement</p>
<p>Some of the areas not checked have neither been encountered by my system or exceed the scope of practice.</p>
<p>takes the Monday morning quarterbacking out of the decision process. Being so rural transport times to different facilities for specialty care adds up when you have limited resources. So, extra set of eyes on the patient can help select the correct faculty and limit wasted resources.</p>
<p>Telemedicine can play an important role in rural EMS where the personnel are EMTs/AEMTs vs. paramedics. The more urban the environment (and greater call volume), and the greater the provider's level, the less the need for telemedicine. CP will always be a need where it is practiced in the broad "general practitioner" sense, because CPs cannot be trained to the mid-level practitioner primary care provider std. and will always need support with more complex presentations.</p>
<p>Telemedicine should be used when there are real time questions that might change care. It would be helpful for QA and risk management. Don't think it should be routinely to contact med control on cases where the care and plan is pretty standard and established. This would distract care from the patient and be wasting med control time.</p>
<p>Telemedicine would be a great asset for rural responders who have long scene and transport times. Would allow interaction between responders and ER doctors. Will improve patient care.</p>
<p>The biggest drawback is funding and connection ability in rural areas.</p>
<p>The medical control physician having real-time video of any situation would theoretically improve decision making, and provide an increased comfort level for pre-hospital personnel.</p>
<p>The unit would have to be small, light and tough.</p>
<p>The use of telemedicine assisted medical control can only enhance the overall assessment, triage, treatment and dispatch of patients. This is something that could be of use for specialty care destinations such as trauma, stroke and stemi by allowing MICN and ED MD staff to see the patient the environment and real time ECG's.</p>

<p>There has been talk lately of taking video screens to major trauma events so that the ED doc can see the extent of the damage to the car. Seems like a good idea, however I'm worried that it may not actually accomplish much. What if the damage to the car is severe but the patient is fine? There's also the issue of discoverability - is this recorded? Is it secure? Will it show up in a courtroom one day? Not sure I want the video to be archived forever.</p>
<p>This could have positive outcome, my immediate concern is HIPPA violations and how to prevent them.</p>
<p>This is an industrial facility: a coal-fired steam electric generating station. If we are allowed to participate in FirstNet [and I know of no reason to exclude us], it may be easier to explain to an online physician our situations with pictures instead of words.</p>
<p>This is something that has been needed in the field for a long time but it simply comes down to funding and who is going to pay for it? With mobile integrated healthcare/community paramedicine, it is changing the way we do business as first responders and therefore our technology will need to change also.</p>
<p>This would require a physician or PA to be available for feedback at the hospital. Are the hospitals willing to have the staffing to handle calls?</p>
<p>Time on scene concerns make this hard to determine. Need to see real benefit to justify any delay in trauma. Biggest value I see is in mobile health consult, etc. or documentation of refusals</p>
<p>Too much time in the field</p>
<p>Trained to make field decisions</p>
<p>Useful for case managers/social workers in assessing the patient's living conditions.</p>
<p>Video is of great benefit during complicated refusal situations. Also beneficial for mobile health practitioners.</p>
<p>Video would allow an expanded scope of practice for the pre-hospital provider which would translate into reduced mortality.</p>
<p>We are not opposed to pre-hospital video or imaging however we need to be careful on how we use video and imaging in the field. All that information will pass through computer servers, and be recorded. The information can then be obtained through open records requests when questions of medical treatment arise. Before implementing pre-hospital video and imaging state and federal laws need to be revised and updated.</p>
<p>We are only 1st Responders. We do not transport, usually within 10 minutes we have a paramedic on scene with an ambulance close behind. Basically, we get VS and they are they to take over.</p>
<p>We currently lack this technology. Will this technology be made available to EMS providers at no cost to their respective departments?</p>
<p>We do not see a need for this technology. Pre hospital care focus is on patient stabilization and the patient's needs. Ambulance staff is qualified and trained, any other intervention via Med Control or Dr. can be achieved via LMR voice.</p>

We have a short transport time in many cases but the most important part for us would be transport destination
Wer are currently working on a program to equip our quick response units with a remote cell phone capable 12 Lead ECG for STEMI.
When using this for patient refusals would the video/pictures be available to use as part of the incident documentation? It would be useful if the video/pictures could be imbedded into the electronic record.
While many of the above options seem attractive I have found that properly trained and equipped medics don't need this level of support. Properly developed treatment and transport protocols will go a long way to resolving many of the above mentioned issues.
With Community Paramedicine upon us, real time video medical control will be a huge resource for pre-hospital care and for patients.
Wonderful

Telemedicine Hospital Usage – General Comments

(hypothetically; no relevant experience)
Ability of physician to see patient as well as receive assessment parameters, may allow for expeditious activation of critical teams.
Activation of stroke/stemi/trauma should be based on live field assessment and not second guessed by providers via video feed
Again if the technology access could be configured to integrate with ED workflow
Again, for us we would not benefit from this as much as the Ambulance service would
Again, field EMS should be able to verbally paint the correct picture or make the decision without use of expensive equipment. Rural areas do not have the funds for this type of equipment. We would not use.
Again, not a lot of help to the ED in my area.
All are excellent with the training assessment being potentially one of the biggest game changer if implemented in such a way that it is not used as a negative but positive reinforcement to real world decisions. Similar to nursing simulation.
Awesome
Bad idea. To many knuckle heads will abuse and misuse the information. I also believe that the HIPPA police will have something to say should images end up in the wrong hands.
Concern of HIPAA violations and problems keeping video secure.
Could increase the current issues of ED Nursing/Physicians versus Pre-Hospital Personnel in the above formats.

For an EMS crew to be able to have a visual indicator of how busy current hospitals are to make better transport decisions would be beneficial. Also hospitals should be able to see which ambulances are enroute to them even before report is called so that they can attempt to prepare rooms. Video/picture messaging should not be as important as an EMS provider's impression of the patient.
Have tried this in the past. Sent pictures of scenes to trauma team via radio frequency. Trauma team did not look at photos prior to EMS arrival and did not show any benefit. Program was discontinued.
How much liability will video create?
I am concerned about liabilities this might open so I believe there needs to be com serious consideration as to how it is applied.
I am glad that even though the trauma system allows us to determine where to take our patient our hospitals need to be reminded that the patient status is subject to change in transport. Which means that they may not be where we were planning on going they may be the drop off point.
I am not yet convinced that images from the field are of such a benefit to the ED staff. What is the problem for which video from the field is the solution?
I believe medical control has no role via tele medicine. Protocols are in place for a reason. I see this going back to the days when EMS had to ask for everything. A well-educated paramedic can have a conversation via phone if he or she needs to consult with medical control. So, my choice is none of the above.
I believe the Video may promote complacency in the on site assessment with increased dependency on medical control direction / assessment..
I don't believe this will assist the hospital EDs much at all.
I don't think it would have an effect on activating trauma, stroke, or STEMI teams. The EDs go off of verbal reports from EMS and trust them to make the right decisions. We transmit 12 Lead EKGs to the EDs already to help make STEMI notifications and get the cath. lab team ready. I can see this being an asset for patient status pre-treatment because ED staff often questions how a patient was prior to sedation or other medical treatment.
I don't think that any of the above would be particularly helpful.
I have witnessed patient trauma status upgraded due to an MVA photo presented by a medic. I believe early notification from the field is helpful to the ED logistically. STEMI notification (prehospital 12 leads is a no brainer and we ALL should be doing that now!)
I see no benefit to any of these.
I see no real benefit of using either video or pictures for pre-hospital and it opens up a whole can of legal worms.

I think that the first few options on here, regarding a greater awareness for actual patient status, display a disconnect between field and ER staff that concerns me. I know it's everywhere, but I should be able to say, "My patient is having a stroke." and have a neurologist in the ER or at least go straight to CT. This shouldn't be a question, but perhaps should be something that is formally earned through a longer or graduated credentialing process for field providers. (Interning)
I think the review and training aspects of this technology is a plus that is often overlooked
I think there is limited use for real-time video for the receiving ED, particularly if not the base for Medical Control. It would take time away from ED providers to look at screen and unlikely to significantly change system response.
I WISH WE ACCTUALLY HAD IT RIGHT NOW.
If I can't give an adequate description, I am not doing my job properly.
If you teach proper assessment and reporting by paramedics, I am not sure how video will add to that. Same for QA, but it would also add and additional component of video storage and linking with hospital and PCR. Who would own this video?
Initial and on-going disaster assessment will be enhanced
It would be great if there was a "smart board" of all EMS calls and ED activity in the County so all ED's could see what is happening at other ED's
Likely to benefit EMTs in evaluation of pts likely NOT needing ED evaluation.
Make sure all communication from Hospital Ed is from a physician and not a nurse directing operations
Many years ago with instant print photography the practice was to provide ER staff with a photo(s) of trauma scene to facilitate visualization. This practice has since ended. ER staff should be treating a Pt based on their presented condition and not on a visualization of a scene.
Medical control physicians would rather not answer the radio, let alone spend time watching a video!
No benefit
No broadband infrastructure that will support this
None
None of these
None of these options seem compelling.
Not beneficial. Waste of time. As with past telemetry and photograph efforts, provided for the morbid curiosity but never changed or enhanced patient care, patient flow, etc.
Not useful in an urban system. Systems already in place.
on critical pts there is no time for live video
One drawback would be FOIA request for video content. Could be used against 1st responders.

Our Fire Dept./EMS/Paramedic personnel already do a good job of relaying information via radio transmission to ER Dept.
Photos are nice but nothing tells the story like live video stream from the field.
Primarily in the rural/frontier setting.
Receiving physicians and nurses rarely have the time needed to take full advantage of this technology and therefore should be limited to resource and time sensitive conditions.
Same comment as above. While there may be rare times whenever this advanced technology is needed, the current EMS training should be improved, if needed. Comms is ALWAYS an issue in incident responses, training, etc. Therefore, this measure would not only add expensive costs and training, but would detract from the use of situational daily response and training. If we cannot trust the training/experience of pre-hospital providers, then we are in a sad state of preparedness.
Same concerns as in #5. I would use it for improving the ED situational awareness as to the general size and complexity of MCIs, but on individual patient's I'm not so sure.
See no advantage to field video on emergency response care. Cost vs advantage...
Similar questions to above.
Simple cell or radio reports by field providers frequently fail to convey the acuteness of critical patients. Video feed and live telemetry would improve receiving facilities awareness of actual patient presentations.
Some physicians despite excellent field reports do not activate the system until they have contact with the patient.
Static image, not live video.
Telemedicine will assist in all aspects of the EMS to hospital transition. It may be a significant tool for community paramedicine especially in rural or remote areas.
The advantage of QA and QI for training and review purposes are most definitely an advantage in my opinion. When trying to ascertain a patient's condition that is questionable, video could give another set of eyes and knowledge base a look and help in decision making other than a medic trying to describe what is happening on the phone. Helps with uncertainty that is seen in the field with some decisions.
The transmissions would likely need to be done from the ambulance while enroute to the hospital. One more thing to be done that would divert your attention from the patient
There have been numerous times that a patient was given treatment that was not optimal because the patient did not present in the same manner that they were found on scene. This would document the on scene findings better and hopefully help to provide the optimal care to that patient.
These are all obvious benefits. The real question is providing a physician with the time to actually watch the scene/incident using the video/picture telemedicine. In real life, the ED physicians are stretched pretty thin just dealing with the normal workload.

<p>This may be useful, but I have concerns with liability and legal issues. Many hospital facilities used this in their QA process and then stopped due to liability issues. What will be the guidelines? Who will have access? How long will materials be retained? I recall patients that I would have liked to have physician assistance with, but contact was difficult for a radio report in the air and on the ground. I am also so busy at times with a patient that I am unsure how this will work.</p>
<p>This would be very useful for documenting changes in patient status from initial contact to delivery to the ED.</p>
<p>This would greatly enhance the Q&A and Case review process as many Medical Directors never see field presentations and rely solely on the written reports.</p>
<p>Video feed would be risky as it gives the ED the opportunity to trust their eyes over what the paramedic tells them. It sets them up to second guess the field crew based off of only what they see...</p>
<p>We are not opposed to pre-hospital video or imaging however we need to be careful on how we use video and imaging in the field. All that information will pass through computer servers, and be recorded. The information can then be obtained through open records requests when questions of medical treatment arise. Before implementing pre-hospital video and imaging state and federal laws need to be revised and updated.</p>
<p>We call the ER enroute as standard practice. If we fail to paint an accurate picture then patient care may not be the best possible. To rely on pictures or videos to tell the story will take that ability to describe necessary information away and possibly be a point of contention if we don't take all the pictures that they may want because we decide transport time is more important. I see this potentially becoming another ER vs EMT tool.</p>
<p>We currently lack this technology. Will this technology be made available to EMS providers at no cost to their respective departments?</p>
<p>We currently take pictures of crash scenes using mobile devices and share upon arrival in ER.</p>
<p>We do not see a need for this technology. Pre hospital care focus is on patient stabilization and the patient's needs. Ambulance staff is qualified and trained, any other intervention via Med Control or Dr. can be achieved via LMR voice</p>
<p>We have on staff physicians that makes the decisions</p>
<p>We should not be using telemedicine just to use telemedicine. A trained EMS person can give me the information I need to make a determination on trauma, Stroke or Stemi and critical pt. However, in the situations where there are questions, then I think it would be helpful. Don't EMS to be distracted or delaying care "just to do telemedicine." It needs to add to the care/ value. It would be good for post incident analysis.</p>

<p>Will the ED always staff the video conference with appropriate staff? If it is just for information/intelligence of scene, then maybe. If it is for medics that are not sure, then maybe. I believe an good medic would be able to provide the information of the same that would be gathered via video/photo for notification, based on trusting the medic.</p>
win win
would agree that it could be used as an adjunct training tool. a very good one at that.
Would not want this to turn into "Big brother is watching you" feeling.
Would only cause delayed transport. Not helpful.

Telemedicine EMS System Usage – General Comments:

"EMS System - risk management - documentation of unruly patient behavior on scene". This is ridiculous. Videotaping an unruly patient is likely to further aggravate them and distract the crew from immediate dangers
Again- all aspects of care would be enhanced as well as risk management and CQI. The ability to see and record secure video can only help care and lower risk for EMS.
Again, All are excellent with the training assessment being potentially one of the biggest game changer if implemented in such a way that it is not used as a negative but positive reinforcement to real world decisions. Similar to nursing simulation.
Again, this would benefit the EMT's more so than the EMR
BAD BAD BAD idea! Imagine your spouse, son or daughter popping up on a you tube video after suffering catastrophic injuries.
Concern about being second guessed
Could be helpful on an entrapment with extremely long extrication, or need for surgeon on scene.
Critical care in our system is inter-facility
enhanced images of social living situation for certain patients
Having video of an RMA would be really effective. It would clearly document that they were/were not as lucid as EMS claimed in their documentation. Of course if those conflicted with each other, you'd be creating another problem.
HIPAA would prohibit this for training in a lot of cases.
Hopefully with the funding from mobile integrated healthcare, we might finally be able to use video image telemedicine from the field. This is something that has been needed from a safety and liability aspect for a long time, along with the increase of patient care and treatment in the field.

I believe there will be benefits like we see locally with stroke evaluations from XXX at local hospitals. There will have to be strict guidelines in place protocol driven. The other issue is reliable connection and everyone has to remember these settings are a lot different than clinical settings in hospital. Noise and other specific environments may create further communication issues leading to possible errors on either end of the communication.
I feel that it would be a distraction from patient care to stop treatment to video in a physician. The focus is on training paramedics to do good patient care.
I feel this equipment would be beneficial to use for future training.
I find that physicians often hesitate to support refusals, I would be curious if adding video would help or not. We are talking about EMS taking on more authority in community medicine, this may be of help. I have concerns about the ability to communicate in the air with video.
I have long envisioned the use of live, two-way audio-video feeds for enhanced physician medical direction of paramedic field assessment and treatment.
I know there is a focus placed on rural EMS but frankly, I'm seeing this as not being all that helpful to that group of people.
I see no real benefit of using either video or pictures for pre-hospital and it opens up a whole can of legal worms.
I worry that patients will not want their picture taken. At what point is it okay? If they sign a refusal of treatment what right do we have to take their picture? And use for training is inappropriate in our community; it would violate HIPPA since the patient can be identified. Also, will it become the norm to document pre and post treatment pictures? Do we need another thing to document, and another piece of equipment (camera)?
Interactive systems can assist on refusals. However, technology is taking responders away from patient contact.
It will require education to get field providers to accept this technology, but it will be very beneficial.
Magnificent
Many of the items covered here would not part of a telemedicine program and would require recording of the video stream to be truly helpful for the EMS system (eg documentation of valuables). Recordings of this nature are fought with legal obstacles that represent hurdles that make the value proposition negative.
Most of the benefits on this list are equally achieved, perhaps better achieved, with onboard video/audio recorders that are not remotely accessible but rather are self-contained.
My area does not have the community paramedicine in place at this time; however, if we did I believe video/picture telemedicine would be beneficial.

My question is once we have taken the time to document, film, share all of the information utilizing this technology, when do I do patient care? Or are we not doing that anymore?
My service has talked about full video capture in ambulances for most of these reasons. Similar to question 5, I'm not convinced this would reduce liability, maybe it would be helpful to document a patient who adamantly refuses transport. I do think it should be used in community paramedicine.
no broadband infrastructure that will support this
None of these options seem compelling.
Not beneficial. Waste of time. As with past telemetry and photograph efforts, provided for the morbid curiosity but never changed or enhanced patient care, patient flow, etc.
Not sure how video and picture taking will fit into privacy laws regarding medical patients. Do believe that this is appropriate for community para-medicine in rural metro areas.
Our local system is currently considering implementing a community paramedicine practice, my personal reservations involve liability and increased scope of practice in the field without direct access to a physician. Video and live telemetry would help to alleviate these concerns.
Patient safety and video documentation of difficult patients a real win for the EMS provider.
Potential value in cases of AMA or release of liability
Public service providers may be subject to open records legislation and be required to release information that doesn't involve patient information.
See above. Tried in the past, a failure as far as patient care is concerned
see comments above
The video should show what the medics see and do. Otherwise it would be used as a tool for second guessing and documenting poor medics that would aid in QA. I cannot say that it would be provide better decision on any treatment. If you are looking to have a virtual doctor at the call and all information and decisions be directed from the conference and the medics only performing the physical tasks, then hopefully the signal does not fail.
There would be better documentation of transient things such as TIAs, but some of these are (dis)advantages -- they work for you as much as against you. Yes, risk management on refusals, but then the concern is a dramatic decline in the rate of refusals and uptick in the rate of unnecessary ambulance transportations and ER visits. There would have to be at the same time a support for non-transportation and community health perspectives.
These are all great. There is no better documentation than seeing it happen. Whether it be real time, or post incident. Body cams on LEO's are an obvious benefit, or threat....depending on the perspective.

This would be good for EMS for training/QA. It would also help in pre/post treatment analysis. It may also be beneficial for unruly patients. I don't believe that it benefits the other areas and would take too long to use in critical scenarios. How does taking a picture help you determine the need for critical care transport? It may help you justify it but I've never had any question it to begin with.

We are not opposed to pre-hospital video or imaging however we need to be careful on how we use video and imaging in the field. All that information will pass through computer servers, and be recorded. The information can then be obtained through open records requests when questions of medical treatment arise. Before implementing pre-hospital video and imaging state and federal laws need to be revised and updated.

We currently lack this technology. Will this technology be made available to EMS providers at no cost to their respective departments?

We do not see a need for this technology. Pre hospital care focus is on patient stabilization and the patient's needs. Ambulance staff is qualified and trained, any other intervention via Med Control or Dr. can be achieved via LMR voice

APPENDIX D: Full Text Responses

Case Study 1 - 5

Case Study #1. Patient Refusal Scenario Question:

PATIENT REFUSAL SCENARIO
(hypothetically; no relevant experience; imaging/video is not "needed" but potentially very helpful)
Ability for direct communication from MD to patient that is refusing care can be beneficial for all patients and not just diabetic AMAs.
Again benefit the EMT's not EMR when the ambulance is there in 10 min. and with our small group of EMR's - there are plenty of times that we are unable to respond d/t everyone is working.
Again, this would have more application in rural/frontier settings with lesser trained/lesser call volume providers.
Again; local onboard video serves the purpose here well EXCEPT for the aspect of perhaps more advanced patient assessment.
As long as all of the Hypoglycemic Treat & Release guidelines are met, we should not have to bother Med Control with Diabetic Refusals, in my humble opinion. ER physicians are busy enough.
Competent providers don't need direction on this. Based on assessment, patient orientation, and protocols, patient can be left without medical control consult.
Consultation by phone is used in our system, but not 100% of the time. Video would definitely reduce liability for the EMS system and physician.
EMS providers are trained to assess, treat and report to the receiving hospital. Communications are always available should field providers need input from the ED provider. We have so many people/groups requesting "just a little thing" that all these "little things" are adding up to big things and we are still graded on our response and on scene times. One might even argue that our time grading is becoming even more restrictive. I believe this is a redundant system that is unnecessary.
EMS worker has final decision on scene.
EMT video has potential of presenting a patient in such a way as to undermine a decision by the EMT.
Everything has the potential of being digitally filmed now....Look at all of the situations involving law enforcement...I don't think EMS needs to be the next feature on the 11pm news.
For questionable/critical refusals- Low risk stick with voice.
Great
Have protocols. No need to speak to doctor
How about no video, no medical control voice order?

I am not sure the MD would be comfortable or covered by malpractice insurance to offer advice to a patient that he/she does not have an existing relationship.
I believe that direct interaction between physician and patient would be best in RMA situations, as the physician could conduct his/her own assessment of patient mental status
I believe with clear protocols the paramedic alone can assessment and manage a diabetic refusing transport. A video clip would be my number one recommendation.
I think a lot depends on other factors -- if this is a complicated situation (the patient also has heart problems or other major medical issues), or if I generally get the impression they're still sick, I think that a live video would be best. If I've been to this residence 97 times before for the exact same thing and the patient is awake, has eaten something with protein and complex carbs, and has an uncomplicated medical history, I'd be more comfortable with regular documentation.
If consulting directly with the physician, it will slow the whole EMS system down. Not necessary in this scenario although I can think of instances where it would be helpful to have direct consult between patients and physicians.
If I have tried and failed to convince the patient to go to the hospital, my preference would be for the physician to see the patient and talk with the patient and make a decision to try and convince the patient to come to the hospital or tell the paramedic it's fine get the refusal.
If it is available, use it.
If the situation is truly correct then then medical control should not need anything other than a radio report and refusal completed.
If the situation is not what it seems then the medic should be able to recognize this and treat accordingly.
If video access is available, it should be used over voice consultation.
If within scope of practice for level of training, no consultation is required in our system for this scenario. This call would always have Advanced Care assigned.
In cases like this, where the patient is otherwise fine, there is no benefit. I would release this patient without hesitation. It would be valuable in cases where the refusal is against medical advice. The physician/PA could perhaps convince the patient to accept treatment/transport or at least it's another level of documentation supporting the release.
In our system, the paramedic is allowed to make this determination. In our system we have not found this to be an issue requiring video or voice documentation.
In this scenario the voice station contact would not even be necessary as the patient falls under our standing orders for refusal and no contact is required at all.
In this specific scenario, I do not believe telemedicine would be valuable
In this straight forward case, I don't think telemedicine would be helpful. A paramedic can make the determination in this case and would be wasting a med control time (distraction). However, if there is a question or concern about a sign off, then I believe it would be helpful. Basically, I believe it should be used when there are questions about care.

little VALUE SEEN FOR PATIENT REFUSALS
Live video with a physician to redirect non-emergent patients to better healthcare options and increase a paramedics ability to obtain field refusals even if the patient does want to be transported.
Live video would be best, I guess. However you then run into a conflict; if that video is analyzed later by some lawyer trying to find fault, even if the MD and the Paramedic agreed with each other and the family at the time, then you have essentially opened a liability door where none existed previously. This may be a case of technology that represents a solution in search of a problem.
Make sure medical control is a physician and not a nurse
Maybe it would be beneficial for a patient and an ER Doctor to have a face to face via video, but other than that I think it's again a BAD BAD BAD idea.
Most ER physicians grow to trust the judgement of those under their medical control, having both met them, knowing the pre-hospital provider's training, and from previous medical calls.
no broadband infrastructure that will support this
No consult to medical control is needed period in a refusal except in rare instances. There is no need to micromanage a competent paramedic.
Not only the patient but also the environment. Is this a safe appearing residence? Does it appear to be an APS concern? Verification that family and adequate resources are available would be very helpful.
No physician contact is needed for these in my area. This technology would not be helpful in these situations.
No useful for a diabetic wake up. Useful for complicated refusals. Above answers reflect that concept.
Not beneficial. Waste of time. As with past telemetry and photograph efforts, provided for the morbid curiosity but never changed or enhanced patient care, patient flow, etc.
our paramedics don't need MD approval/consult to do this
Our protocols dictate we contact our Medical Control to verify they agree with our decision.
Our system allows for EMS provider guided refusal of treatment/transport for diabetic patients WITHOUT use of online medical control. Clear Offline Medical control direction regarding this aspect of patient care includes specific 'refusal' criteria that providers must assess.
Our system already uses a very comprehensive Treat and Release protocol for diabetics. We will contact Medical Direction only in rare cases.
Our system would no contact medical control in this situation
Paramedics and other EMS personnel are trained and have the experience in dealing with diabetic refusals. In our system, we do not need medical control permission to obtain a refusal from a diabetic patient
Patients do have the right to refuse but would benefit from direct physician consultation

Potentially more helpful if patient refusing and significant concern by providers. Visual interaction could further convince patient to agree to further treatment. Diabetic example above however, video would likely have limited utility.
Protocols already in place for this. Paramedics have appropriate training to make this decision.
Refusal by standing order is acceptable.
Regarding video... How would the EMTALA duties of the ED doc be affected by making remote contact with the patient? In Kansas, for example, video conference counts as a physician being "present" so that puts increased liability on that doctor instead of on the service medical director where it belongs
Relying on the physician to make the call puts burden on them, and takes decision making away from the field. Things like lighting or ambient sound may affect video and complicate the discussion, distracting from patient care. It is a bad idea. If they need a doctor to tell them not to see a doctor something is wrong with the situation.
The doctor should have the option to conference with the patient.
The online physician should be able to ask for a level of interaction that makes the physician comfortable with the outcome of the encounter.
There would need to be thresholds. A standard AMA would need this video consult, but a high risk certainly could benefit.
This allows another set of eyes to be able to see the patient so this would be a big help.
this could be attached to electronic PCR
This example is a low acuity low liability call and therefore of less use.
This happens in the field all of the time. A video clip to document that the proper steps of a patient refusal to be transported have been followed would suffice.
This is a an underestimated liable situation for all involved in my opinion. To date we have no way to measure insulin levels in the field as this is the usual culprit. While transport/consult to/with the ED is not optimal it is the only option in my opinion. In this specific scenario video or pictures would not justify the request for refusal of care from a once unresponsive patient.
This is a non doc contact in most systems. Stepping backwards
This is CRAZY...Medical Control should trust the role the paramedic...there is no need for video for this.
This is currently how our system operates
This may allow more hypoglycemic patients to be treated on scene and released. Our protocol now advises to treat enroute to the hospital. Medical control always reminds us that we can't "kidnap" the patient even if there's still concern that they may have a recurring episode so I don't think the other options above are viable.
This seems to be a poor example of possible uses for this technology, routine use of live micromanagement by facility physicians will over time erode critical thinking by field providers. Save it for the trauma, acute cardiac cases and community paramedicine.
This situation is added to most EMS protocols already and not a good example.
This type of documentation could prove invaluable.

Tricky issue. Even with the physician "seeing" the patient he/she has no legal right in our State to insist on transport. The legal liability issue needs to be addressed to insure that all providers have a better understanding and, if possible, legal protection. At the least the video can document attempts to inform the patient of the risk/benefits of non-transport vs transport.
Trust in EMS Personnel's decision is important for confidence. Video conference would be more beneficial in the cases where the patient refuses against the medical advice of EMS personnel.
Unless local protocol states that you need to contact med control, this patient fits into the state protocol and can be left at home under the conditions stated above
Video or voice consultation should not be needed in this scenario unless the medic wants it.
We are not opposed to pre-hospital video or imaging however we need to be careful on how we use video and imaging in the field. All that information will pass through computer servers, and be recorded. The information can then be obtained through open records requests when questions of medical treatment arise. Before implementing pre-hospital video and imaging state and federal laws need to be revised and updated.
We can leave these patients, but video confirmation may be useful.
we do paperwork that the patient must sign if he/she refuses to be transported
We have on staff physicians that makes the decisions
What problem are we trying to correct here? This is an A/Ox4 patient who is validly refusing transport.
What would the liability be to the physician that he saw the video, but did not lay hands on the patient?
which of the following would be helpful:
While live video is helpful, if we trust our medics in the field in this case it would be superfluous
While the advancement of "telemedicine" can in some instances provide better patient care, it seems that the underlying reason is to limit, reduce or replace the EMS provider.

Case Study #2. Mechanism of Injury Scenario

Mechanism Of Injury Scenario Comments
(hypothetically; no relevant experience; imaging/video is not "needed" but potentially very helpful)
A great tool for ER docs
A picture for the ED/Trauma team may be valuable if there's significant trauma. I don't a video would change the treatment, transport decision, or continuum of care in this case.
A picture is worth a 1000 words. Many times the patient is not presenting to the ED with signs and symptoms consistent with the damage done in the crash. This would provide additional insight to the treating team at the ED of the forces involved in the crash.
A picture with a radio report should be sufficient.
additional scene information would be nice - uncertain how would translate directly to improved patient care
Again I believe there would be benefit for better understanding with mechanisms of injury for ED/Trauma teams. We need to make sure reliance of pictures is not hindering patient care depending on the number of EMS providers on scene and if it is safe to take pictures, i.e., are cameras intrinsically safe to use on scene.
Again this is the ambulance service, we are lucky to have enough personnel to respond and get started.
Again, I think a lot depends, this time on both the patient and the hospital. If this is one of our Level I's, all would be acceptable, depending, but if it's our busier one, I'll see them when I get there, because they're probably working a trauma arrest right now. If I think she's about to crash on me, then the more aggressive video stream is probably warranted, in such a way that the hospital can glance over at any time and see what I see, then get back to their trauma code.
as a former trauma coordinator, there was little value in the scene pictures EMS would bring in from a trauma surgeons perspective
As long as it can be integrated into the workflow and does not delay or interfere with patient care
Concerns include having the time to interact with the video if it is live streaming from the paramedic themselves. I certainly understand the importance for them to see the crash, MOI, but our focus needs to continue to be on the patient. Streaming video to ED in the ambulance would be helpful. Also - concerned that the Physicians will not be focused on pre-hospital, they are busy in the ED.
For the last few years, we have been using still images to show ED personnel MOI and any injuries prior to packaging and/or wound care. This procedure has been an important factor in continuing good patient care and ongoing assessments with more successful outcomes.
have done this in the past to show ER staff the amount of energy exchanged on scene
Having access to Video for receiving hospital personnel would give receiving doctors and nurses info on what possible injuries the receiving patient may have based on what the scene looks like and better prepare resources at the hospital for receiving the patient.

Head injury assessment requires good neurologic assessment, which live feed can provide
High quality well composed still imagery that can be taken simply and under direction (Dr: "take a closer picture of the entrapment") is preferable to ad-hoc video. Reviewing video takes more time/effort (pause/rewind/review) by the ED than if it is essentially pre-processed and recomposed by members on scene.
How about no video, no medical control voice order?
I actually don't believe video/photo is all that helpful for trauma. The EMS crew can describe either a benign scene or a concerning one, and trauma surgeons are usually just cookbook knee-jerk practitioners who tend to CT scan the entire body of a major trauma patient anyway regardless of patient complaint let alone photo/video.
I believe this would be very beneficial!
I could see this being useful in the setting of an MCI so you could see the scene and its associated scale but that's it. See above.
I don't think any of this is needed.
I remember instant Polaroids 20 years ago. They mostly didn't get used.
I think voice report is fine. We call in over the phone, not radio. Pictures of the scene may be beneficial, but how much time is spent doing that instead of the medic participating in packaging and transport?
I used a polaroid camera in the 80s, major improvement with real time video.
If patient is already hypotensive, it should not take additional images to call a Level 1 response at hospital.
I'm dating myself, but for many years, I carried a Polaroid camera, took scene pictures and left them with the patient at the hospital. With HIPPA laws, some of the suggestions might be problematic.
Image of patient presentation (color to face, size of abdomen, work of breathing).
In my earlier years we carried a Polaroid and would take pictures of the accident scene then relay them to the hospital ED staff. A few years ago I had a family member in a bad accident and when I reviewed the injuries and status with the surgeons the pictures I had helped them gain an understanding of the injuries and other underlined complications. I'm all for this type of system and believe in it with first hand use and outcomes.
In this scenario, I think that video documentation would extend scene time and it would be detrimental to the patient.
It is more than an hour flight time to the nearest Level I trauma center, Level I burn center, or Level I [any specialty you care to name]in my neighborhood. I frequently have wished for the ability to directly provide that specialty care Level I facility with the information I had at first patient encounter.
It may or may not be helpful, but it usually doesn't hurt to send a photo of the possible MOI. But if not available radio report should suffice. A wearable camera to record what is needed would be nice

It's funny that there is no negative opinion option on your choices, only "no opinion." Trauma team doesn't need video from the crash before the patient arrives. They deal with the patient.
it's just one more thing to do, and it is hard to remember and/or find time to take pictures, especially if it is critical. Maybe if the supervisor on scene (if there is one) could do that?
Just still pictures of the scene. Anything more would be data overload and not helpful to either party.
Live feed of what the patient looks like would assist the receiving medical staff. They can see the damage and see the patient presentation. Skins, behavior/reaction to care, any distention, bruising & so on.
Live feed would be nice. Important for the cameras to be able to send accurate color images. Some cameras have issues with transmitting true colors.
Many years ago with instant print photography the practice was to provide ER staff with a photo(s) of trauma scene to facilitate visualization. This practice has since ended. ER staff should be treating a Pt based on their presented condition and not on a visualization of a scene.
Mechanism of injury is not relevant, cars are made to crumple. Physiologic parameters and history of death in vehicle, ejection, ok to call a trauma alert
Mechanism of injury only raises the index of suspicion, but provides little absolute decision making. The net of a full hospital workup will still be needed
Medical control physicians would rather not answer the radio, let alone spend time watching a video!
NO
No benefit
no broadband infrastructure that will support this
No visual representation of mechanism of injury is necessary for a trauma team to do its job.
None of these would be needed. A basic quality verbal report would allow for activation.
Not beneficial. Waste of time. As with past telemetry and photograph efforts, provided for the morbid curiosity but never changed or enhanced patient care, patient flow, etc.
Note: In some jurisdictions, law enforcement will confiscate image recording devices such as cell phones if photos are taken of an accident scene using the excuse that it is evidence of the scene.
Obviously the salesman also sells pie in the sky and ocean front property in Iowa.
Outstanding
Physicians/surgeons/PAs have nothing to add with respect to MOI information that cannot be relayed by the paramedic on scene. MOI is not a reliable predictor of severity or outcome anyway. Seeing the MOI may be distracting for the clinician.
Pictures are interesting but yield very little information about the patient's actual condition. Our decisions are based on clinical findings and the paramedic's report of scene findings is more than sufficient. It would be impractical to capture and review video in any way that would be meaningful unless the crash itself was recorded from inside the vehicle.
Portable ultra-sound telemedicine sent from scene and interpreted at hospital in advance to aid in fast surgical assessment.

See # 6 above
Seeing is believing. If the trauma team sees the MOI and the real time evidence of what the patient and providers are dealing with, the better they are at predicting what is needed on their end.
Several of these options would be fine as long as set up of the video/ camera system does not interfere with patient care times.
So much shows up to the provider's eye through his/her peripheral vision that would not be visible or would be difficult to assess from a wearable camera that I believe taking the time to get a "good" image of the scene would require too much extra time and personnel that are not available without a person dedicated to such a task. The next question that has to come up is. "Who would view/assess the images in the hospital?"
The advantage of a video clip is that the receiving person could play it several times if needed. A live feed is great too, but if you missed the image of interest you may not be able to play it back like you would a clip. it would probably be set if the medic could take a clip of what they felt was the high yield subject, transmit it, and then activate a live feed for continuous monitoring. I could study the image of interest but also stay up to speed as the scene develops.
The concern I have is that any video may interfere with patient care. Also, who would cover the cost of the equipment? Small rural departments cannot afford this equipment.
The first time a local minister or other community leader is in a car wreck with an open bottle of alcohol and it is filmed the whole system would be discarded.
The report of High Trauma Accident is verbally presented during the EMS golden hour it would be rare to have a video of the actual real time accident and watching a replay would take away for on-hands assessment .
There must be a fast and easy method to download or share the video.
Think a voice report would be sufficient (I'm getting excited about this case - badness); the picture might be helpful. My fear is that we delay care and transport while we are videoing. Also, in a busy ED/ trauma center, we don't have time to be watching scene video. The wearable camera would be helpful in the QA process.
This patient is hypotensive with abdominal pain. There is no reason for video. It is the gray area patients we need this for not the black and white.
This type of technology needs to be used at the scene ASAP to give the hospital time to prepare. Not much use when bringing patient through the doors.
Trauma services should be contacted concerning this question and inquire what THEY would like to see happen or prefer to receive from EMS on a scene.
Trauma team resources are limited and take time to assemble, pictures or video would be help in the ED side with the decision making process.
Using video to document mechanism contradicts the shift over the last several years to minimize mechanism as a decision point in favor of physiologic changes. This would likely cause more confusion and potential for under triage in trauma patients.
vehicle damage is being shown to not be totally predictive of probable injuries

Video is overkill And a waste of time where there should be none. A picture from a smart phone does the same job.
Video of the patient during transport
Video will delay definitive care. The patient may need surgery and staying on scene to video the crash will delay care. Backboards have delayed care in penetrating trauma enough to be measurable and now you want video? This is a poor choice.
Video would be great for documentation. not needed for report and too time consuming.
We already do this with existing camera/phone capabilities.
We are not opposed to pre-hospital video or imaging however we need to be careful on how we use video and imaging in the field. All that information will pass through computer servers, and be recorded. The information can then be obtained through open records requests when questions of medical treatment arise. Before implementing pre-hospital video and imaging state and federal laws need to be revised and updated.
We have on staff physicians that makes the decisions
We show pictures once we get to the ED now on our smart phones but that does little good when it comes to the MICN or the doctor making a decision to either take the patient to a higher level trauma center or utilize an air ambulance. Nothing can describe the scene of an accident like video footage. It would be nice to be able to send this footage to the trauma center and MICN. Live video footage when the first responders are trying to work is not a good idea.
What we don't need is the resulting idea that EMS would have to gather releases from anyone that was casually in the picture during the incident.
Whether picture image, video clip, or live video, any and all information that can be visualized by ED/Trauma Center along with Paramedic voice report is extremely beneficial to the receiving facility to better prepare for patient coming in.
Would assist in determining what level trauma center for appropriate transport
would provide some additional information, but not essential
Would result in treatment and transport delay.

Case Study #3. Patient Assessment Scenario

A hospital should be able to trust the assessment of an EMS provider without video evidence.
Again the same - not for our small group of EMR's that are available
Again, I think that all EMS responders are trained and have the experience to recognize stroke symptoms. Taking time for the video clip would interfere with patient care.
Again, this scenario doesn't apply to my area. All hospitals are stroke centers and smaller EDs can drip and ship.
All of our ambulances are ALS as are over 60 pieces of fire equipment. This would be really useful in systems with BLS units.
Any form of video would help. Still images do not necessarily add much more value than verbal report
Are you sensing a trend in my answers? I've been this EMT on a few occasions. Unless it's a complicated situation (they also have a history of cirrhosis and kidney problems which both may cause a similar presentation), I think that all providers should be comfortable making the call to activate a stroke team. On a more complicated call (many EMTs haven't seen a patient present with elevated ammonia), then consulting with the doctor may be beneficial, and doctors are better at delivering bad news.
Assessment of stroke victims is still a basic EMT protocol. This is insulting to say that it takes a paramedic to talk to a doctor.
Basic life support should not only allow the physician to interact with patient, but call advanced life support for further treatment.
Basic Stroke Scales used by Basic EMTs have been validated.
Current EMS training should be sufficient for stroke recognition. Transport protocols usually fall to the State regulations of the certified responder.
Either of the two listed could be helpful when paramedic on scene assessment is not available.
Either of these would be more beneficial than neither. The quicker the Neuro team makes the decision that the symptoms are real and not imagined, the quicker they are to act.
Especially with a BLS situation, that transport decision is critical, especially living in a rural area and helicopter evacuation is frequently the only way to timely, definitive treatment.
Even a basic EMS unit should be able to recognize stroke symptoms following stroke scales. It is imperative that all communication from the EMS provider pass back and forth through operations or the physician.
Even in video, no determination of the patient's BG can be made. Based on the clinical picture. Transport to a Stroke Center is indicated.
Even with photos/video, at some point the 'system' has to depend on the training and skills of the on-scene medical professional. Otherwise, why even have them if the patient could simply 'face-time' their doctor.

For real time decision support and retrospective review this could be helpful
I feel like if the patient was showing stroke like symptoms and the patient is semi-conscious it would be better to err on the side proactive rather than ignore the possibility stated by the family. With all the information out today to the public I believe the family would have a good idea of may have been going on.
I really see the usefulness of this in CVA's. If the Neurologist could do the exam prior to the patient's arrival, we could skip the ED and go right to the Scanner. Could make a big difference in Patient outcomes and reduce costs at the same time.
I think it would be useful for either. If the first two are not available, documentation of the patient at the scene would be useful as a comparison for the physician.
I would not want to see the industry trade skills for a camera; EMS providers should not become just drivers and cameramen.
If any stroke symptoms are reported, I have my doubts that ANYONE would recommend against a stroke center. But if that were going to happen, it would be with direct video interaction
If it fits the Stroke Alert criteria then call for it and transport accordingly. The criteria is BLS assessment skill enabled.
In any of these recording methods or not, relying on the Paramedic is paramount as they would be doing any hands on.
In our system by using a protocol based call triage system, an EMT crew would not be assigned to this incident, additionally system protocol is to transport to 1 of 2 stroke centers in our city, no consultation is required.
In this case, it would be worth the effort and time to make sure the patient received at the appropriate care.
In this scenario it is a transportation decision only which should be done based on presentation, a decision of the crew and the physician. IF the patient or family does not want to go to the designated center then MC should interact directly with the family and patient to help them get to the proper destination. If a system were being developed it should be able to interact with both patient/family and/or EMS.
Interaction with family on the scene can be problematic, I think it would be best for all interactions to take place with the EMS provider
It is of my opinion that no physician is going to rule out a stroke in this situation. A CT is necessary with the ability to immediately treat the findings.
It should be as simple as allowing the field provider to conduct a field stroke assessment and triage the patient to the appropriate facility based on that assessment.
Live video consultation has risk of delaying patient transfer to hospital for definitive care.
Live video would be best, it would allow you to conduct a neurological exam and see responses in real time. But again, DISCOVERABILITY and SECURITY are important. Is this getting transmitted wirelessly? What if someone hacks your connection and watches the video like some kind of medical voyeurism? What if lawyers demand it if the patient doesn't

do well. Would be very useful in destination determination situations, but in my area that is a non-issue.
live would be best, but video clip would be better than current voice only communication
Medical control physicians would rather not answer the radio, let alone spend time watching a video!
NO
No benefit
no broadband infrastructure that will support this
no consultation is needed. should go to a stroke center by protocol
No consultation is needed. The system should address this in protocol; a decision of this magnitude should not be left to whether a medic decides to make a call or not.
Not applicable in this area as all hospitals are stroke centers.
Not beneficial. Waste of time. As with past telemetry and photograph efforts, provided for the morbid curiosity but never changed or enhanced patient care, patient flow, etc.
Only if it is unclear, as in a negative stroke scale evaluation, and patient is an acute stroke.
Our protocol would identify this based on time, which is much simpler.
Prehospital personnel should be able to recognize a stroke. And whatever stroke scale is used should describe the patient's condition.
protocol directs patient to stroke center
Protocols already in place for this decision.
Stroke assessment by EMT's is very simple compared to the NIH scoring an ED or Neurologist would perform. So long as it doesn't delay transport I see some actual advantage to video conferencing between the MD and the possible stroke patient enroute.
Superb
The ability for an MD to see or guide an assessment especially if BLS is the only resource can only be a benefit to the patient and the EMS system.
The BLS crew could be advised to check a blood glucose on scene and if it's normal the patient should go to the stroke center. Transferring a stable patient to the local facility will only delay the stroke treatment that's needed. No video or picture needed for this scenario.
The Cincinnati prehospital stroke scale is easy to administer; you can easily talk someone through the scale if they have never performed it. Likewise, abnormalities are easy to judge; anyone can tell if the face is asymmetric or the arm drifts or the words do not come out right. Then, since the scale is validated as a predictor of stroke, if positive, take the patient to the more distant certified stroke center.
The doctor could have a video consult and see how patient presents, get valuable info from bystanders that were with the patient when the episode or symptoms began. A transport determination could be evaluated on a case by case basis. Telemedicine could also be used at a receiving hospital to stabilize a patient if transport to a specialty stroke center is not the best option due to weather or other scenarios.
The list seems to be in descending order of what would be helpful
Think this may be a major use of the technology

This is a complexed issue and one that I feel would not be made better by photo of video imaging, as protocols can vary from different areas throughout the United States.
This case would be good for air medical requests when the patient is a long distance away and there is a choice between a comprehensive and a local primary stroke center.
This is potentially helpful, but most hospitals are secondary stroke centers so this would mostly apply to rural areas.
This may be helpful to determine course of care as long as video does not waste time. Could this be done while transporting? When in doubt, transport to the PSC.
This patient should be transported to a stroke center after BG check.
This seems like it will delay care.
This seems to be second guessing the EMT and shows a lack of confidence in the EMT
This would also be helpful in determining if a paramedic intercept from an intermediate jurisdiction is necessary.
This would be a great use for a lower-volume BLS ambulance crew.
This would help the EMT's with direction from the physician but I don't see the need for the family to get involved unless they were hindering the transport of this patient, which doesn't sound to be the case.
Time is brain....video in this scenario would prolong the scene time.
Time of last known normal is needed which the crew should obtain and based on local protocol determine where the patient is transported.
too far to next hospital to matter
Value of physician interaction with patient is vital component given that EMT stroke exam often misses subtle stroke findings
We are currently working with one of our hospitals to incorporate this into our system.
We are not opposed to pre-hospital video or imaging however we need to be careful on how we use video and imaging in the field. All that information will pass through computer servers, and be recorded. The information can then be obtained through open records requests when questions of medical treatment arise. Before implementing pre-hospital video and imaging state and federal laws need to be revised and updated.
We do not have this type of arrangement in our system, so I do not have an opinion on this topic.
We have been doing live video stroke assessment in the ED for about 4 years and it works out great.
We have on staff physicians that makes the decisions
Who better knows the patient's normal status than the patient themselves or the family members? Consultation direct with doctor could be critical in the care of the patient.
You doom people to higher morbidity and mortality rates even flirting a BLS response in a rural setting. There would be benefits in an urban or suburban setting where access is rapid.

Case Study #4. Physician Assisted Patient Care

"Use all of what you have" is my opinion.
(hypothetically; no relevant experience)
A well-educated paramedic shouldn't need advice on basic treatment.
Again it seems that some options would be better than nothing
Again, this too is a complexed issue as it may be of benefit to the receiving physician; however it may not assist the end using Paramedic; as Paramedic are required to follow a set "scope of practice". Therefor if the child required advance intervention that is beyond their present "scope" it would simple be good information for the physician only.
Asthma care is a standard and ETI is a scope of practice skill. Major value would be in determining level of intervention. I.e., continue beta agonists, move to intubation.
Difficult case. Telemedicine would be helpful. Would go the live video consultation.
Do ED physicians actually have time to talk EMS providers through procedures that they should already be proficient through departmental training?
Ensure high quality EMS personnel who can act without direct oversight.
First of ALS ambulances are not ICU's, if this patient is that bad you should have at least and RN and a Paramedic transporting or you should be thinking about a rendezvous with a critical care team (helicopter or ground unit with a flight nurse and a Paramedic on board). Paramedics have protocols they follow and should be compartment in them. Having a ER Dr. ask a Paramedic to do something that's out of their scope or protocols would not fly with any Medical Directors I know.
First, Helmet Cam?? I don't see this happening. Technology should include a mounted device with cameras positioned around the inside of the vehicle. So, Live consultation but not helmet cam.
For the ambulance service.
Having someone talk someone through a difficult intubation, I don't think would be useful and might delay the process. Letting the physician see the severity of distress might be useful, as an alternative treatment may be useful or going beyond the current guidelines.
Helmet cameras are bulky and they interfere with patient care in the ambulance. I could see a small chest mounted camera when needed.
Helmet mounted cameras are a great idea (but they must be adjusted and focused correctly). All EMS providers should be wearing lightweight helmets.
Helmet video camera and video laryngoscope: you are talking major money here!
I assume this is an appropriately trained paramedic.
I can easily see this being a thing of the future but once again this will help to cover the paramedic by a physician signing off on the patient as well.
I can see value in this situation, adult or peds
I don't think seeing the patient will change anything that protocols don't already address.
I personally have not had any issues with using verbal medical direction, but can see how video could be helpful.

I would hope a Paramedic level EMS provider would already know the appropriate care for this patient.
I would think that a paramedic could handle the call stated above. If the transport time is extended, have other resources been considered, i.e. air transport.
If a paramedic really needs advice on the proper course of treatment then a video clip or live video would be best. I personally would not want a physician talking me through a procedure, especially an intubation.
If I don't know how to intubate i don't want to "learn" over the camera.
if no additional time was needed -- automatic video available with voice consultation
If there is uncertainty regarding patient treatment then "seeing" the patient is valuable.
In a simple, its obvious status asthma, the medic should be comfortable enough to do everything possible, including mag sulfate, nebulized lidocaine and mag and epi and if none of that works, comfortable enough to RSI. (And prepared to code the patient.) Yet again, if this is a complicated patient, especially a patient with cystic fibrosis, or a history of a rare disease or Addison's (especially if all you have is Etomidate), live consultation is probably better.
In this rare scenario, live video might be helpful as long as the logistics don't interfere with execution of patient care.
Interaction between field provider, patient, and physician are all important for best outcomes.
Keep in mind that to effectively demonstrate, a physician will need materials at his/her disposal. We do this now and it takes a lot of time and effort
Live consultation would be in patient's best interest; however, the paramedic should be able to describe situation accurately and be able to understand any procedure being describe by physician.
Live feed would be the best to visualize and guide the care enroute.
Many paramedics can intubate and start IV's in the back of a moving rig with no problems. I do see problems happening if they had a physician looking through a camera while they are trying to treat an acute status patient. There is a time and a place for the physician to be involved but the paramedic needs to make that decision on when that time is.
Marvelous
Medical control physicians would rather not answer the radio, let alone spend time watching a video!
Most providers will have ceiling mounted PTZ cameras controlled by medical control base station, not helmet cams. Helmet cams are impractical in most cases. Greater resolution with mounted over wearable.
no broadband infrastructure that will support this
Obvious choice here.
Only scenario where I could see help useful that the crew should not be able to handle the care based on protocol and cell phone report
Paramedics are going to look quite silly wearing helmets on difficulty breathing calls.
Paramedics are NOT talked through procedures on the phone. They are trained to perform all procedure within their scope of practice.

Paramedics in our area probably see as many Asthma patients in a year as a typical Dr. I would hope that they would be able to competently treat the pt.
Paramedics should be comfortable in these courses of treatment. I foresee valuable time spent setting up video stream instead of treatment.
Protocols should already address this. Don't see direct benefit to patient care
Rural providers would be very appreciative of this level of technological support.
Scope of practice issues with choice 1
The above would be good; but keep in mind many of the rural areas described in that scenario do not have sufficient bandwidth for live video. Many of the very rural areas with prolonged transport times do not even have cell service/radio transmission capability.
The Command Physician could see in near real time what the paramedic and pre hospital crew sees. Direct consult and direction could be given to better provide a course of treatment modality.
This could be addressed through training and clearly laid out protocols.
This is an impossible scenario. If the paramedic is going to intubate the patient, he/she should be trained and allowed to intubate the patient. Interaction during the procedure (video laryngoscope) would violate the time requirements necessary for proper intubation. Lighting is so variable in an ambulance that it is difficult for somebody at a remote site to make an accurate diagnosis. Train your people to assess, treat and document properly and allow them to do so.
This is live on scene consultative support where that effort could improve outcomes
This is when a direct conversation with a physician would most benefit a paramedic.
This option would possibly violate the Paramedics scope of practice by allowing procedures not trained on.
This should be an adjunct for the medics not something to rely on for step by step instructions from the MD
This would work out well as long as the EMS system is set up for that advanced treatment. Most rural EMS agencies should have enough training to handle this situation without the need for consultation unless medications above the level of training of the paramedic are involved. In that case, a video or at least an audio consult would be appropriate.
Train the advanced EMT on the video-assisted laryngoscopy, just as they would any new treatment techniques/tactics/protocols.
Verbal online medical control is needed
We are not opposed to pre-hospital video or imaging however we need to be careful on how we use video and imaging in the field. All that information will pass through computer servers, and be recorded. The information can then be obtained through open records requests when questions of medical treatment arise. Before implementing pre-hospital video and imaging state and federal laws need to be revised and updated.
We have on staff physicians that makes the decisions

<p>What paramedic needs to be talked through skills they should have? This discussion presents more ER vs EMT arguments. EMT's and paramedics have skills, and we don't need someone in our ear telling us what to do when we should already know.</p>
<p>Why would a Paramedic need this, he is fully trained in Proper treatment of this pt...</p>
<p>With a critical patient, I think it would be quicker to give your verbal report to medical control. You can paint a clear picture and get advice easily. Sometimes the driver of the ambulance will actually give the verbal report so the paramedic in the back can continue to treat with both hands. Taking the time to take a picture or video could be detrimental to the patient.</p>

Case Study #5. Mass Casualty Incident Scenario

<p>"Use all of what you have" is my opinion.</p>
<p>(hypothetically; no relevant experience; imaging/video is not "needed" but potentially very helpful)</p>
<p>A camera on the triage officer might be useful.</p>
<p>A general live video would give receiving hospital personnel a general idea of what they will be dealing with and better prepare resources for patient arrival.</p>
<p>A picture of the MOI would be helpful for hospital prep.</p>
<p>Again, if automatic and did not add to time or complexity for field personnel.</p>
<p>Any information would help. Live video from air support, any video or pictures to allow faster and more efficient response and preparation for patient arrival and appropriate resources. Even after the patient care what resources are necessary for clean up? Heavy equipment- fuel or chemical clean up- what roads or ingress/egress/detours are necessary.</p>
<p>Anything which adds complexity or time to this scenario is counter-productive.</p>
<p>Based on MOI the number of patients we would advise the Hospital we had a Level One Trauma incident. The hospital would then get several Doctors/Surgeons in route to prepare for the incoming wounded.</p>
<p>Best answer available. This type of scene is difficult enough....training before the event on methods of triage and a transportation decision tree need to be in place. You cannot fix this type issue with a "expert" on the phone or TV or camera.</p>
<p>Communications Centre is responsible for Hospital notifications and Triage tracking, on-scene Medical Sector Command (EMS Supervisor) will assess patient destination decision based on existing triage policies and level of care required. No consultation is required.</p>
<p>Could go with different answers. Obviously, more information is better. However, we don't want to be distracted and delay care by spending a lot time looking at videos.</p>
<p>Don't give the ED the opportunity to over react, over prepare, or second guess. Stay put, get ready for what they are told they are getting, and see the rest on the news.</p>

Don't turn the Incident Commander or supervisor into a videographer. If weather, light or sound is bad the video may not be useful anyway. Would that person's skills be better served on the ground rather than behind a camera?
Either of the two listed would be helpful.
Exceptional
For an MCI this information may overwhelm staff viewing live video. A clear concise radio or telephone report would be more beneficial.
For mass casualty, we have enough to worry about without having to transmit images.
For the ambulance service - this would be beneficial
I actually can't think of a situation where anything other than a phone call or voice report is given for this, to tell the ERs how many we're sending, but I work in a system where we have two Level I's within half an hour and multiple Level II's and III's that can handle pediatrics, and three dedicated children's hospitals, including two that are burn units, so it's difficult for me to imagine a situation bad enough that multiple video streaming screens is worth the logistic problems.
I hate to tie up EMS for this
I think more benefit may be served through allowing a better way of documenting mass casualty incidents without potentially confusing pertinent data between various patients.
I think this would be a terrible precedent, filming victims. Being with a patient is how to tell who goes first. What ER doc has time to stop and look at images when they are preparing to take care of mass casualties?
I think video could transmit too much. Verbal is all I need as ED
I would think that this would be a better visual for Incident Command rather than the ED or Medical Command
If you call medical control and report a bus crash with victims and the severity the hospital will know this is a bad situation. No video is needed.
If you have an expert in disaster/mass casualty/incident command that can serve as the incident commander by live video feed then this would be beneficial. After all, incident command is somewhat distant from the event anyway so why not over video if you can bring an expert incident commander to the event?
It depends how many responders you have on scene and if you could designate someone to take videos/pictures.
live feed could allow ED to prepare, but not hinder field care by providers
Live video would be good, just to see what maybe going on. If you had a video clip, when would it be viewed? If there was time to view it would be good, otherwise it is like the no video or pictures - the radio report must be sufficient.
Live video....and not media controlled. This would be very helpful but would require strong privacy protections.

<p>MCI are completely in the purview control of the on scene paramedics and incident commanders to be worked in concert with medical control. It is my experience all that medical control needs to know about the MCI is how many (individual) Immediate, Delayed, and Minor patients there are, so they in turn can make a determination as to how many of each category the surrounding receiving hospitals can accept. Therefor I see little benefit to photo or video imaging.</p>
<p>MCI's are too fast paced to have a distant medical control trying to interact. A still image of the scene would be sufficient as well as live data as to where ambulance are transporting and with how many patients and what types of injuries.</p>
<p>Medical control physicians would rather not answer the radio, let alone spend time watching a video!</p>
<p>no broadband infrastructure that will support this</p>
<p>NO, Again this will do nothing to help the outcomes. Come on man!</p>
<p>Not sure there is time/personnel available to shoot video with multiple patients, but if there is it could be useful to better describe the scene. I don't think it would impact patient care however because of the volume of patients and probable resource limitations</p>
<p>One more thing to do or one additional person needed for filming and not fully available for treatment</p>
<p>Patients need field triage, not sending pictures and having someone who is not at the scene trying to triage. EMS providers are able to triage. If need for consult on care as you are awaiting transport vehicles, then that would be useful.</p>
<p>Picture image series due to the probable distractions of the scene.</p>
<p>Pictures in this case will make the receiving facility go into overdrive mode and over react. If the medic on scene is calm, the hospital should be as well and pictures will only take that away.</p>
<p>See above</p>
<p>The most difficult component of MCI is field triage. This would require live interaction with providers to improve.</p>
<p>The video/photo would give a realistic impression of the magnitude of the crash to the ED personnel.</p>
<p>There is already too much happening on an incident like this. Video would just complicate matters.</p>
<p>These can be chaotic. With body cams, it can look like a goat rodeo, but the real time documentation of the situation would be beneficial to the team at the local facilities, so that preparation can be made to receive patients.</p>
<p>This could be helpful as long as you had enough personnel on the scene to transmit the video</p>
<p>This is a management, rather than clinical scenario.</p>
<p>This is another case where a live helmet camera would work well. Downloading clips probably won't be practical due to time and staffing constraints. Using this system for field triage would not be practical nor prudent.</p>

This is another impossible scenario. To use a live feed in the manner suggested here would require a trained, specialized videographer.
This may be somewhat over-whelming for both the EMS personnel and the hospital staff. This may be very over-whelming on the system if multiple hospitals are involved.
This should simply be an advisement of number and severity. We just got a simple, Simplex Med Channel system operational. We need a more elaborate MED Channel system to even be able to communicate with the hospitals. Current system is not even a repeater, and has limited range.
Too much chaos to have time to video and explain the scene to the hospitals. # of patients being transported to their facility, severity and ETA is all that needs to be communicated during a MCI. Too many tasks to accomplish / voice reports are short and to the point.
Too much going on in a mass casualty scenario to be beneficial to hospital personnel.
Valuable in setting up ER for possible influx of patients with varied injuries.
Very difficult to deploy video technology in this hi-paced scenario (using any current technology)
video would delay/hamper field responders in MCI, this should be a core competency of the field staff requiring no direct MD involvement
Watching videos like this in the ED would likely slow down the preparations for incoming patients.
We are not opposed to pre-hospital video or imaging however we need to be careful on how we use video and imaging in the field. All that information will pass through computer servers, and be recorded. The information can then be obtained through open records requests when questions of medical treatment arise. Before implementing pre-hospital video and imaging state and federal laws need to be revised and updated.
We have had the above scenario a couple of times. Voice report worked.
We have on staff physicians that makes the decisions
When in the course of a mass casualty incident would one stop pt care to do a video or pic feed to a physician. I feel that this would severely hamper our ability to quickly and appropriately handle patients.
When it comes to MCI incidents, live video or regular video footage would be extremely helpful on painting the picture of what the paramedics are dealing with and the severity of the mechanism.
With a scene as chaotic and potentially spread out, tele medicine may not add to better awareness in this type of situation.

APPENDIX E: City of Houston Fire Department ETHAN Program

City of Houston ETHAN Program: Video Telemedicine Pilot Project

The City of Houston Fire Department (HFD) recently completed a pilot project that allowed paramedics to engage in real time video consultation with a dedicated medical control physician.¹² The project is called ETHAN for (Emergency TeleHealth and Navigation) and was funded by the State of Texas using an “1115 Waiver” which allowed the use of CMS¹³ funds for the pilot project.¹⁴ The Houston EMS system provides service to more than 2.1 million residents. Forty hospitals receive more than 300 patient transports each day. Like many EMS systems, HFD only transports half of the patients they encounter following a 911 call for service.

This pilot project was designed to improve the utilization of EMS services; to divert medically appropriate patients away from hospital emergency departments; and to provide a follow-up program to ensure that at risk patients successfully entered the health care system. Houston Fire had previously used a nurse screening program to validate EMS response and later used paramedics to question 911 callers to determine the appropriate EMS response. In order to eliminate delays in dispatching EMS resources, the program was modified to allow paramedics to contact medical control after arrival with the patient. Minimal triage of the EMS request is now done by the dispatch center.

The ETHAN program is the latest iteration of the project and uses emergency department physicians and a video chat program linking the physician, paramedic, and patient. The project operated 7 days a week on a variable schedule that matched periods of EMS system high utilization. EMS units were equipped with Panasonic G1 Touchpad computers with built-in cameras. This is the same device EMS crews were using to complete patient care reports. Paramedics evaluated the patient and then contacted the base station physician if the situation met certain criteria for a possible ED diversion. The physician could engage with the paramedic via video chat and also talk directly to the patient and family members. This program was based on a similar concept used by U.S. military forces in Afghanistan in which video telemedicine was used to determine transport methods from the field to the hospital.

The HFD base station physician had access to a variety of technologies that supported their mission. They could access a radio console that would let them speak with the paramedic using the EMS crew portable radio. A second computer screen displayed a map which indicated the

¹² Interview with Dr. David Persse, City of Houston Fire Department, EMS Physician Director.

¹³ Centers for Medicare and Medicaid Services.

¹⁴ The pilot project started operation in December of 2014 and was completed in October 2015.

location of the EMS call while also displaying the location of nearby health care clinics. If the patient had been seen previously by EMS, the physician could access their patient care record.

Base station physicians had access to 30 clinics that were available under contract to the ETHAN program. A computer screen showed available clinic slots which allowed the base station physician to schedule an ASAP appointment. They also had direct access to Yellow Cab dispatch software allowing them to request alternate transportation.

Physicians did not use a predefined message script when interacting with the EMS crew or a patient. Instead, there were two primary elements of the evaluation:

1. Does the patient need ambulance transport?
2. Does the patient need to go to the ER (or to a clinic)?

Base station physicians did not “practice medicine,” based on risk management concerns following an interpretation of Texas law which controls how physicians may prescribe medication. One of the original program goals was to allow the ETHAN physician to evaluate the patient and send a prescription to the patients’ pharmacy if they were out of their meds or provide them with a limited prescription until they could get into the clinic. However, that portion of the project was not implemented in this phase.

The physician was authorized to tell the patient that they could not use an ambulance for transport. The Fire Department received concurrence from their city attorney to stem inappropriate use where the patient insisted the ambulance take them to the ED. Patients could go by cab or their own vehicle to the clinic or the ED. The City of Houston had a flat rate reimbursement contract with the cab company and with the health care clinics that received patients from the ETHAN program.

All patients entering the program were automatically referred to the health department for follow up. A public health nurse would call the patient within an hour to make an initial contact and to reconfirm the follow up plan, which may have been a clinic appointment. The nurse also reinforced the patient care plan.

The following day, the public health nurse would visit the patient and complete a more detailed assessment to identify what factors were impacting the patient, what assistance was needed, and what medical care, and social service benefits were necessary. The nurse then updated the patient record and helped create a “medical home” for the patient. They also provided education on appropriate health care access strategies and on the proper use of the 911 system for EMS activation.

Early feedback from the program included the following observations:

- Initial connectivity problems with the video chat program were resolved.
- The camera lens on the EMS device needs to be cleaned to provide a clear video image.
- Training of the EMS crews on use of the equipment was relatively easy.
- The patient/physician video interaction frequently revealed additional medical history information the patient had not offered to the paramedics.

A June 2015 project summary report indicated increasing adoption of the program by field personnel. Only 20% of the ETHAN patients were transported to the ED by EMS. Fifty percent took a cab to the ED, and the remaining patients were referred to a health care clinic (14%), or their primary physician or other care provider (16%). The majority of the patients encountered in the program were covered by insurance and had resources necessary to manage their problem. Only 20% of the overall patient population was considered homeless.