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EMERGENCY MEDICAL SERVICES

Adding Value to a Fire-Based EMS System

Monograph 7



International Association
of Fire Fighters



Emergency Medical Services Adding Value to a Fire-Based EMS System Monograph 7



**Department of Emergency Medical Services
International Association of Fire Fighters, AFL-CIO, CLC**

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Foreword

Today more than 80 percent of fire departments perform some level of emergency medical services (EMS), making professional fire fighters the largest group of providers of prehospital emergency care in North America. No other organization – public or private – is capable of providing prehospital emergency response as efficiently and effectively as fire departments. Fire department operations are geared to rapid response, whether it is for EMS or fire suppression. Cross-trained/dual-role fire fighters are trained to aggressively attack their work whether it involves a fire, a rescue, or a medical emergency. It is no surprise that study after study has shown that fire department-based prehospital emergency medical care systems are superior to other provider types.

However, as we look into the future of prehospital emergency medical care, we are called upon to evaluate our role and the possible need for change in the context of a rapidly evolving medical care system. We must look at what we have learned during the past century and create a vision for the future of fire-based EMS. This vision must address necessary legislation for the protection of fire-based systems. It must address public education, prevention, and the possible expansion of the scope of practice for paramedics. This vision must consider the effects of managed care organizations on prehospital EMS, as well as revenue recovery for the services fire fighters perform. It must also protect fire-based systems from the threat of privatization, as well as protect the citizens we serve by preserving the nation's universal emergency access number, 9-1-1. The information in this series of monographs is designed to guide local fire department leaders through the process of developing a vision for the future of a fire-based EMS system. This monograph is the **seventh** in the series and contains information for adding value to a fire department, enhancing the value of the services traditionally provided, as well as implementing services beyond those historically offered.

The role of the professional fire fighter is constantly changing. We are called upon to act as multi-faceted first responders answering not only fire calls but rescue, hazardous materials, and emergency medical calls. By answering the challenge of change, we can continue to meet the needs of the communities we serve and do what we do best — protect property and save lives.

Harold A. Schaitberger
General President

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Adding Value to a Fire-Based EMS System

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INTRODUCTION

The fire service is a multi-faceted, multi-disciplined organization. By nature, fire fighters are America's first responders regardless of the type of emergency. Cross-trained/dual-role fire fighters are trained to handle the most time-critical events on a scene, whether fire suppression, rescue, or EMS. Emergency medical services include medical first response, rescue and extrication, basic life support (BLS), advanced life support (ALS), transport services, and disaster coordination. This ability to continually handle such a wide range of emergencies comes from the fire service's ability to monitor the needs of the community and adapt to meet those needs.

Community needs will continue to change because of social and economic pressures as well as sweeping health care reform. Fire department leaders must assess the strengths and weaknesses of their EMS systems and determine if extending or improving the services already offered or implementing new services would add value to their departments in the future. Efforts to extend or improve core emergency response and transport services can be addressed by implementing quality assurance or quality improvement programs. Other enhancements include EMS research activities, passing legislation or regulatory statutes to maintain the integrity of fire-based EMS systems, or seeking capitated managed care agreements to provide revenue for existing services.

Additional services should be considered for fire departments that consistently meet the community's needs in the delivery of core emergency components. Value added services can include injury prevention programs, elderly patient follow-up, inter-facility transport, teaching CPR classes, and perhaps primary health care.

This monograph discusses enhancements to existing services that add value to the department, as well as additional services that are considered "value added services."

I. ADDING VALUE TO A FIRE-BASED EMS SYSTEM

A. WHAT IS THE AGENDA FOR THE FUTURE OF FIRE-BASED SYSTEMS?

In 1996, the 30th anniversary of the emergency medical service industry, the National Highway Traffic Safety Administration (NHTSA) looked at the status of EMS nationwide, developed a vision for the future of EMS, and published findings in “EMS Agenda for the Future” (available through the U.S. Government Printing Office). NHTSA predicts that EMS systems of the future will be community-based health management systems that are fully integrated with the overall health care system. NHTSA also states that the future EMS systems will have the capability to identify and reduce illness and injury risks through prevention, provide acute illness and injury care and follow-up, assist in the treatment of chronic conditions outside hospitals, and provide community health monitoring. It is projected that EMS will be further integrated with other health care providers, as well as public health and public safety agencies. EMS providers will improve community health and bring about more appropriate use of acute health care resources like the hospital emergency departments. Yet, even in light of predicted changes, NHTSA’s “EMS Agenda” recognizes that EMS providers will remain the public’s emergency medical safety net.¹

In an effort to realize this vision, NHTSA’s “EMS Agenda” proposes the continued development of fourteen components of EMS services.

- Integration of Health Services
- EMS Research
- Legislation and Regulation
- System Finance
- Human Resources

**INTEGRATION OF
HEALTH CARE**

- Medical Direction
- Education Systems
- Public Education
- Prevention
- Public Access
- Communication Systems
- Clinical Care
- Information Systems
- Evaluation

Many of these components represent well established elements of fire-based EMS systems. Others, however, should be considered as potential service enhancements for fire departments. Looking toward the future, these components are discussed below.

Fire-based EMS systems were created to meet the immediate needs of the acutely ill and injured for stabilization and transportation. Current fire-based EMS providers regularly meet these objectives in a rapid, effective manner. Most fire-based EMS systems, however, are not designed to provide additional health care services. Adjustments, however, can be made to integrate other health services.

Patient care follow-up and patient advocates are services which fire-based systems can integrate with existing duties. For example, the Metro-Dade County Fire Department provides a program called Elder-Link. This program allows fire department emergency responders to enter elders, with non-emergency needs, into the social services network. EMS providers are in a unique position to determine when the needs of their patients are likely to extend beyond immediate care and transport. Without this follow-up, vulnerable elderly could fall between the cracks of the local health care system.

Another example of an EMS/health service integration is the joint effort

between the Lee County, Florida public health department staff and fire-based EMS personnel. EMS personnel in Lee County assist in providing widely needed pediatric immunizations or tuberculosis testing. In this cost effective approach to preventing communicable diseases, everyone benefits.

EMS RESEARCH

Research involves the search for answers. Research in the field of EMS, typically is conducted to improve the effectiveness and efficiency of emergency medical care. Ultimately, EMS research is an effort to improve care and resource allocation.²

Research can be highly useful in efforts to preserve or improve fire-based EMS systems for the future. Answers to questions about the impact of EMS services on the public's health are particularly crucial. For example, how do EMS systems impact morbidity, mortality, and costs of traumatic injuries and emergency illness? Additionally, as an integral part of the nation's health care system, EMS is being subjected to critical review, not only with regard to how well EMS systems perform but also, whether that performance is worth the cost.

- **EMS System Data Collection**

Fire-based EMS systems should implement a data collection system. EMS data collection enables EMS researchers, including system medical directors, to evaluate and improve access to emergency medical care for individuals with severe injuries or illnesses. The overall goal of EMS is to reduce morbidity, mortality, and the impact on the financial and social impact of illnesses and injuries on our society. Data collection is crucial in determining whether EMS systems meet that goal. Following outlines the steps to begin.

First, determine the existing resources within the system. (i.e. engines, ambulances, paramedics, etc.) in addition to emergency apparatus

and staffing, assessments must include answers to the following questions.

- How many hospitals are within the jurisdiction?
- What is the level of training of prehospital personnel?
- What equipment is carried by responders?
- What additional training is needed?
- What funding resources are available?

Second, determine the pattern of use of the system.

- Who uses the system?
- How many children?
- How many elderly?
- How many cardiac emergencies?
- What geographic location is the busiest?

Third, determine what the system does.

- What procedures are provided in the prehospital arena?
- Are the procedures provided correctly?
- Does the system have appropriate medical direction?

Fourth, determine if the system is time efficient.

- How long does call intake and dispatch take?
- What are average and fractile response time intervals?
- What are average on scene times, grouped by incident type?

Fifth, determine if the system is effective.

- What have been the trends in overall population mortality, particularly mortality from injuries?
- Do cardiac arrest patients resuscitated in the field survive to discharge? One year post discharge?
- Does early ALS affect return of spontaneous circulation in the field?
- How satisfied are patients with the EMS system?

Additional observational research objectives include:

- What happens to the pattern of EMS use following public education efforts?
- Are the efforts of preventative efforts measurable by lowered incidence of specific injuries (for example, fewer children with head injuries after education on bike helmet use)?

- **Uniform Data Collection**

There are likely to be several obstacles to uniform EMS data collection, including the following.

- Data exist in several different locations, such as prehospital records, emergency department records, and vital statistics records.
- There is no defined, uniform set of data elements to be collected.

The second obstacle, at least, may be overcome by using Uniform Prehospital Emergency Medical Services data element definitions. The list of data elements and definitions that should be included in a fire-based EMS data set can be found in Appendix 1 of this monograph. Fire service leaders must recognize that data is power. Objective data regarding local EMS systems can serve to justify, protect, or enhance the systems in the future.

INFORMATION SYSTEMS

The ability of research to provide conclusions supporting the fire-based system depends partly on valid information. Information collection systems record and arrange data for future use. With available technology, data can be easily collected, stored, and retrieved. Once collected, the information can be used for multiple purposes including system effectiveness research and evaluation of pilot projects. The most efficient information system allows providers to enter data according to specified

**LEGISLATION AND
REGULATION**

uniform definitions, with that data being available for retrieval for billing purposes and multijurisdictional research.

An example of a data collection system is the National Fire Incident Reporting System (NFIRS). Researchers can access this database to perform statistical analysis and formulate conclusions. Insurance companies can receive claim information, and fire departments can maintain accurate records of activities. Many state EMS systems have designed Patient Care Records (PCRs) using one standardized form statewide. Copy of call records are then made available for use in the statewide EMS database. Similar standardized reporting systems exist for cardiac arrest (Utstein Template) and trauma events (Triss Method).

Regardless of the method of data collection, fire-based EMS systems must begin the process of information gathering to facilitate effective research of fire-based EMS system design.

Within the United States and Canada, each state or province has legislation providing statutory basis for EMS activities and programs.

State governments have found that it is in the public's interest to assure that EMS is available, coordinated, and of acceptable quality and generally provide some funding.³ Provincial governments, however, are planning to stop central government EMS funding; provision of EMS will become the responsibility of local communities.

EMS laws vary from state to state and from province to province, particularly in requirements for EMS system components. Regulatory agency flexibility under these laws varies as well. EMS legislation leads to EMS rules and regulations that affect the design and operation of all EMS systems. It is vital for fire service leaders to monitor and amend pending

legislation to protect or implement fire-based EMS systems. (See also IAFF Emergency Medical Services, Monograph 2, “EMS Legislation” for more information about how to become involved in the legislative process.)

SYSTEM FINANCE

Personnel, equipment, training, supplies, medical direction, and operational expenditures are required to provide prehospital care. Taxpayer subsidy is in place to provide for fire department operations in general, and perhaps fire prevention as well. But the added cost of exclusively EMS items may challenge departmental financial viability. Fire-based EMS system survival may depend on tight budgetary controls and development of supplemental income sources.

EMS revenue may be generated by “fee-for-service” systems, capitated agreements with health insurers, or subscription programs. Fee-for-service programs charge individual patients for care provided based on the services rendered. Capitated agreements may pay providers a negotiated rate per health organization member transported per month (both emergency and inter-facility). Some of these agreements may also allow payment for providing follow-up, patient education, or prevention services. Finally, subscription programs allow the public to prepurchase EMS services and avoid being charged additional fees when the service is used. (See also IAFF Emergency Medical Services, Monograph 4, “Revenue Recovery, for more details on how fire-based EMS systems can generate revenue.)

PUBLIC EDUCATION

Public education may include prevention efforts, as well as public relations. While fire and injury prevention efforts assist the citizens by reducing the likelihood they will require EMS assistance, public relations programs should introduce them to the system that is in place to respond when assistance is required.

Emergency response providers are constantly in the public eye. This high visibility can provide opportunities for public relations and “marketing” efforts. Citizens decide how fire-based systems will evolve in the face of

economic restraint. By educating them on the value and necessity of fire-based EMS services, we may preserve the effective and efficient fire-based systems already in place. Examples of public education topics other than prevention might be “What happens when I dial 9-1-1?”, “What does a fire fighter/paramedic do?”, or “What are the services available from this EMS system?”

Public education sessions should be tailored to the individual needs of audience. Audiences may include: community members, health care professionals, policy makers, law makers, and insurance providers. All public education and public relations efforts should be evaluated. Evaluation helps ensure that the intended message is received by the audience and provides guidance for program modifications. Fire-based EMS public relations materials are available from the IAFF.

PREVENTION

Injury prevention is increasingly important for both improving the nation’s health and truly controlling health care costs.⁴ Injury is the third leading cause of death and disability in all age groups, and accounts for more years of potential life lost than any other health problem.⁵ In response, EMS systems are emphasizing wellness and prevention in community outreach efforts to keep illnesses and injuries from ever occurring. These primary injury prevention programs present an opportunity to enhance the health of the community, as well as the relationship between the fire-based EMS system and the taxpayers.

EVALUATION

To provide the best care, EMS system must be evaluated and modified to meet the changing needs of the community served. Evaluation is the essential process of assessing the quality and effects of EMS so that strategies for continuous improvement can be designed and implemented.⁶ There are several approaches to this evaluation component, all of them having “quality” as the focus; quality assurance (QA), quality control (QC), quality improvement (QI), continuous quality improvement (CQI), and total quality management (TQM). Key areas to

be evaluated include the following.

- Response Times
- Level of Training
- Resource Utilization
- Skill Retention
- Communication System
- Patient Outcome Studies (Cardiac, Trauma, Pediatric)
- Paramedic Performance

B. ONGOING QUALITY IMPROVEMENT

To justify what fire departments do currently, or to enhance effectiveness, many departments are utilizing various versions of “Quality Assurance” (QA), “Quality Improvement” (QI), “Continuous Quality Improvement” (CQI) or “Total Quality Management” (TQM). Regardless of name given to efforts to ensure high quality services and products, the common element is meeting the needs of those who pay for and use the services and products provided by an organization.⁷

Quality Assurance is the sum of all activities undertaken to provide confidence that the products or services available maintain standards of excellence established for those products or services. Quality assurance asks whether system components are being used properly, comparing their use with some predetermined standard.⁸

Quality Improvement is the sum of all activities undertaken to continuously examine and improve the products and services. Quality improvement activities are described as being prospective, concurrent, or retrospective depending on when they are conducted in relation to an event (for example, relative to a call for prehospital medical care).

- **Prospective QA/QI** activities are useful in preventing problems. While prospective QA/QI is essential, their expense and the time that must be devoted may be seen as disadvantages. EMS personnel

**TYPES OF QA/QI AND
TIMING CONSIDERATIONS**

education and periodic skills evaluation are examples of prospective QA/QI activities.

- **Concurrent** activities occur as an event takes place. For example, concurrent QA/QI activities may include direct observation of a paramedic's performance in the field by supervisors. Additionally, indirect observation may take place by the on-line medical director during radio or telephone communication. Concurrent QA/QI activities are highly relevant and are more meaningful if improvements are made in a timely manner. Using evaluation models for employee discipline, however, defeats the purpose and reduces the effectiveness. Concurrent QA/QI efforts can be expensive, if done randomly, and may cause inconsistencies in retraining or continuing education efforts. Direct observation may also affect EMT and paramedic overall performance, because people tend to act differently when they know they are being watched (the "Hawthorne effect").
- **Retrospective** review is a type of systems evaluation and can be divided into four areas:

Debriefing— discussion of events with the receiving physician or designee

Critique sessions— recreation of events at a later time with all parties involved sharing the key points from the event (also known as morbidity/mortality conferences)

Chart review — checking the EMS chart for completeness, accuracy, logic, and correlation with attending physician's emergency department record

Chart audit — comparing charting with established policies and procedures to determine personnel compliance levels

**QA/QI
CONTENT
CONSIDERATIONS**

While these activities do not necessarily help the individual patient who has received care, they increase overall system value by improving future service. Retrospective QA/QI approaches are inexpensive and can focus on target areas, for example, evaluating the appropriate use of oxygen in the patient with chest pain.

Regardless of design, quality assurance programs must contain mechanisms that evaluate the following standards.

System **Structure** Standards — These standards address compliance with government mandates for resources, such as response vehicles and trained responders, within the EMS system. Structure studies ensure that the mandated resources are available, but do not evaluate the impact those resources have on patient care.

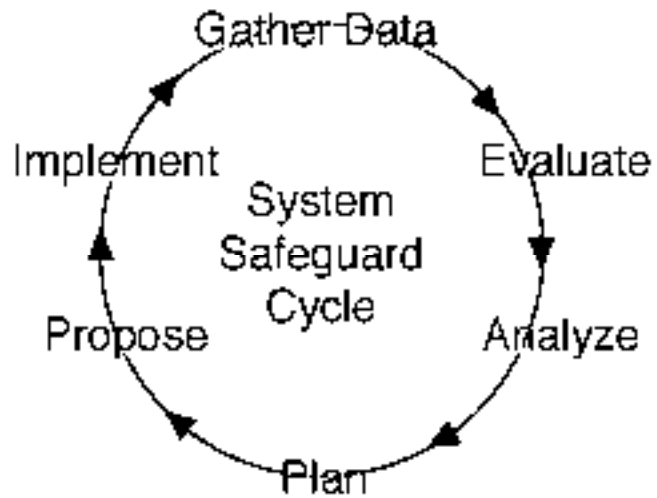
System **Process** Standards — The use of EMS System resources and the appropriateness of such utilization. Process evaluation can answer questions like “What parts of the system work?” or “What component does not work and requires modification?”

System **Outcome** Standards — The results of the care given the patient. Outcome evaluation is a necessity in measuring the overall effectiveness of an EMS system. When the QI process recommends a change in the system that may affect patient care, the effectiveness of that change should be assessed.

**QA/QI PROCESS
CONSIDERATIONS**

The process of QA/QI is best defined as a continuous loop. Regardless of the timing or the focus of review, any findings must be considered part of a dynamic cycle of change. Each new finding may lead to a system modification, which would then require further evaluation of its predicted effectiveness. This may also be called a system safeguard cycle (Figure 1).

Figure 1.
CQI Cycle



A continuous quality improvement (CQI) program, like other value added services, can assist fire department leaders at the local level in identifying the parts of their systems that must be adjusted to meet the changing needs of their communities. As suggested changes are made, they must be evaluated for their effectiveness. Having a continuous evaluation tool in place adds credibility and value to a fire-based EMS system.

II. FIRE-BASED EMS “VALUE ADDED SERVICES”

In addition to the fundamental services described in the “Agenda for the Future” above, fire departments should consider expanding services in the following areas when planning for their future role in their communities.

- Injury Prevention and Public Education
- Elderly Patient Follow-up
- Inter-Facility Transport
- CPR Classes
- Automated External Defibrillation
- Community Outreach
- Primary Care/Expanded Scope of Fire-Based EMS Services

A. CHANGING NEEDS IN THE COMMUNITY

The following is a list of changing community needs that may require additional services within fire departments providing prehospital EMS.

- Fire prevention activities have decreased the number of fires and fire related injuries.
- Managed Care Organization (MCO) pre-authorization systems triage calls **away** from 9-1-1 emergency services.
- Third party payers of health care services want patients transported to the most appropriate “in-plan” facility. This facility may not be the hospital emergency department. Or, payers may not want patients transported at all, leading to home care or treat and release programs.

**INJURY PREVENTION AND
PUBLIC EDUCATION**

- Communities want to be prepared and educated to handle emergencies and major disasters situations.
- Public health agencies plan to make a special effort to ensure that all children are immunized.
- Citizens, recognizing American Heart Association recommendations, want all EMS first responders to carry defibrillators.
- Satellite hospitals and nursing homes want reliable inter-facility transport providers.
- Social service professionals need EMS personnel to follow-up patients sent home with chronic illnesses.

B. DESCRIPTIONS OF “VALUE ADDED SERVICES”

Fire department personnel already have experience in public fire safety education, distributing smoke alarms, and teaching children appropriate behavior in case of fire. The advantages of injury prevention over injury care are not difficult to understand whether the injuries are related to fire or other trauma. Fire departments can build on their community education efforts to include other causes of injuries in their jurisdictions. Programs can be developed to teach vehicle air bag safety, seat belt and bicycle helmet use. Efforts can also include health promotion, such as immunization promotion.

It is widely recognized that injury prevention is more cost-effective than injury treatment. Nevertheless, it is useful to collect data to show the value of specific injury prevention efforts. For example, at least one study found safety belt use reduced hospital admissions from crashes

by 65% and hospital charges by 67%.⁹

The Tucson, Arizona Fire Department conducted a highly successful injury prevention program. As a result of preventive efforts and public education initiatives, child drowning-related deaths in Tucson have decreased by more than 50%.¹⁰

Injury Prevention Opportunities:

- In 1992, the American Academy of Pediatrics established October as “**Child Health Month.**” The first Monday in October was chosen as “**Child Health Day**” to create public awareness of the value of preventive health care for children. During this time period, fire departments can distribute educational materials or host special child safety classes. Injury and disease prevention is the cornerstone of pediatric health care. Promotional materials can be obtained free of charge from the American Academy of Pediatrics at (800) 433-9016.
- Similarly, a week in February has been chosen as “**National Child Passenger Safety Awareness Week.**” This is an opportunity to remind the community that taking time to protect children in cars takes only a few moments. Fire departments can conduct child safety seat clinics at fire stations. Fire Fighters can provide free inspection and installation of child safety seats. Brochures are available from the National Highway Traffic and Safety Administration at (202) 366-5440.
- The National Highway Traffic Safety Administration has also released “**Safety Advice From EMS (SAFE): A Guide to Injury Prevention.**” The SAFE manual was created using relevant traffic safety information and injury data. This information was then enhanced with EMS-specific references by a panel of safety and EMS professionals. The manual is designed for use by prehospital EMS providers. It can be used in presentations for various age groups in different settings. Eleven lesson plans include: Child Safety Seats, Occupant Protection

for Adults, Pedestrian Safety for Elders, Teens Driving Under the Influence, and Yielding to Emergency Vehicles. Along with the detailed lesson plans are safety and EMS resource lists, as well as a 38 minute video to enhance the presentation. The SAFE Kit can be obtained free of charge from the National Highway Traffic and Safety Administration at (202) 366-5440.

- Using materials generated by the National Safety Council “**Air Bag Safety Campaign**,” departments can educate their community on the benefits and safety concerns related to vehicle air bags. The “ABC’s” program also targets injuries to children, “**Air Bag Safety: Buckle everyone! Children in back!**” For more information contact the Air Bag Safety Campaign at (202) 625-2570. This proactive approach could reduce the number and cost of vehicle air bag injuries to children and adults who do not use seat belts.

Fire department programs targeting injury prevention and safety increase a department’s visibility and value leading to greater community and political support.

**ELDERLY PATIENT
FOLLOW-UP**

Metro-Dade Fire Rescue in Florida participates in “Elder-Links,” an innovative program to improve the health of the community’s elderly. After an elder calls 9-1-1 for assistance, responding fire EMS personnel conduct an initial evaluation. If personnel determine that the elder has non-medical needs, the client is referred to the Elder-Links Project. The project assesses the elder’s need for preventive community-based services. This program, thus, serves as a safety net for elderly persons who are vulnerable to abuse, neglect, or exploitation which may be indicated by repeated “non-medically oriented” emergency calls. This is an extended service of Metro-Dade Fire Rescue. More information about this extended service can be obtained by contacting the Elder-Links Project at (305) 670-5556.

**INTER-FACILITY
TRANSPORT**

Fire departments should consider instituting inter-facility transport services to augment their ability to care for more critically ill or injured patients. Fire-based EMS systems can increase the number of revenue generating transports by establishing inter-facility transport contracts with area hospitals, nursing facilities, and health insurers. These contracts are secondary to the provision of emergency response and must not compromise the integrity of the emergency system. Following are models that may be used in beginning an inter-facility transport service.

- **A fire department provides ALS first responder and transport services** — To implement inter-facility transport, additional transport vehicles could be added to the fleet (number and operating time based on need, for example, 10 a.m. - 5 p.m., Monday through Friday) and staffed by fire fighter EMTs and paramedics called in for overtime.
- **A fire department provides BLS first response with defibrillator and ALS/BLS transport** — To implement inter-facility transport, the department could deploy additional transport capable vehicles on a full 24 hour, 7 day basis staffed with full-time paid cross trained personnel. This model would provide the opportunity for field personnel to be rotated between various duties within the department not having personnel solely dedicated to transport duty.

Both models above offer opportunities for fire departments to contract with nursing home facilities, hospitals with satellite facilities, urgent care centers, and managed care organizations. The revenue generated from providing these additional services should more than offset the cost of the implementation. Cost analysis and planning assistance may be requested from the IAFF on these and other models.

CPR CLASSES

The American Heart Association defines four components in the “chain of survival.” These are: early access, CPR, defibrillation, and advanced cardiac life support (ACLS). In a study published in 1993, “Predicting Survival From Out-of-Hospital Cardiac Arrest: A Graphic Model” researchers found significant relationships between each of these “links” and survival from out-of-hospital cardiac arrest. The predictive model shows that, as the time from collapse to bystander CPR lengthens, the likelihood of patient survival decreases.¹¹ Fire departments can increase patient survival by ensuring that the system includes all four links in the chain of survival. Access to 9-1-1 and rapid response times are crucial; however, the fire department can strengthen the CPR link by teaching a portion of the community to provide CPR. This training increases the availability of bystander CPR, enhancing the overall effectiveness of the fire-based EMS system, positively affecting cardiac arrest outcomes, and adding value to the fire department.

**AUTOMATED EXTERNAL
DEFIBRILLATION**

The third link of the chain of survival is defibrillation. The American Heart Association, National Institutes of Health, and other national EMS organizations have called for automated external defibrillators to be placed on every first response vehicle.¹² Research has documented the high value of fire fighter defibrillation in both the United States and Canada.¹³ Rapid defibrillation with automated external defibrillators improves cardiac arrest outcomes, increasing the fire department’s value to the community. Ideally, defibrillation is followed by ACLS services, also provided by the fire department.¹⁴

COMMUNITY OUTREACH

In October 1993, the Texas Department of Health sponsored the first workshop in the nation to teach paramedics to administer vaccines. Since then, paramedics throughout Texas have immunized thousands of children as part of the state health department’s “Shots Across Texas program.

**PRIMARY CARE/
EXPANDED SCOPE OF
FIRE-BASED EMS
SERVICES**

In April 1994, Lee County, Florida public health unit nurses trained three Lee County EMS paramedics and two paramedics from a local fire department to perform and interpret TB tests. In May, those paramedics screened nearly 100 students in an elementary school where several cases of TB had been reported. In July, those paramedics also began monitoring TB patients to ensure that patients regularly take their medications.

Using the Texas Health Department's "Shots Across Texas" and Lee County's TB testing programs as models, fire department paramedics could conduct immunizations and TB testing in the community. Additionally, the Health Care Finance Administration states that the Medicare program will pay for influenza vaccine and its administration.¹⁵ These important disease prevention programs can thus benefit fire departments (as a source of revenue) as well as citizens.

Immunization and disease screening projects are also excellent for increasing community outreach and building public relations. The technical skills and knowledge build on paramedic training. However, the skills required to conduct these programs may be limited to certain occupations (for example, registered nurses and physicians). Check with state EMS officials before proceeding with any outreach programs that involve administering any vaccines or medicines.

The scope of practice refers to the legal boundaries of medical care provider actions as defined by individual states. A clear scope of practice precisely defines what actions can be taken by each category of medical professional. Other than the paramedic's "role" statement found in the Paramedic National Standard Curriculum, the scope of practice for paramedics has not yet been standardized.

In addition to programs such as the immunization projects described

above, paramedics have undertaken pilot programs to provide primary care, including blood pressure monitoring and workplace medical surveillance screening. There are both advantages and disadvantages to expanding the scope of practice of the paramedic to include primary patient care or illness prevention. Regardless of their expanded responsibilities, however, EMS personnel must make the integrity of the 9-1-1 emergency response system their first priority. It is crucial that this essential public service be accessible to all citizens in the community. (See also IAFF Emergency Medical Services Monograph 6, "Paramedic Expanded Scope.")

CONCLUSION

As the needs of communities change, fire service leaders may explore options for adding value to their departments. To ensure success, efforts must meet needs documented by research. Research must also be used to assess the value of additional services and ensure the highest quality possible.

Moreover, fire-based EMS leaders must remain committed to ensuring that the integrity of the primary mission — providing rapid, effective on-scene emergency care — is maintained.

ENDNOTES

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GLOSSARY

Capitation: A method of payment for services in which, based on a pre negotiated contract, a health care provider is paid a fixed amount per person per month, regardless of whether the individual actually uses the health care system. This system transfers the risk from the insurance payer to the health care provider.

Cardiac Arrest – A condition in which the hearts electrical impulses suddenly become chaotic.

Cardiac Defibrillation – The procedure of delivering electrical shocks to a victim in ventricular fibrillation (a rapid, non-functional pulsation of the heart) as a means of trying to restore functional rhythm and pulse.

CPR (cardiopulmonary resuscitation) – The combination of artificial respiration and manual artificial circulation that is recommended for use in cases of cardiac arrest.

Cross-Trained/Dual-Role (CT/DR) – An emergency service that allows personnel trained in emergency situations to perform to the full extent of their training, whether the situation should call for firefighting or medical intervention for a victim. This system type offers a greater level of efficiency than its single-role counterparts.

Defibrillation – The delivery of a very large electrical shock to a part of the chest/heart. Stops the abnormal activity and allows the heart to restart normally on its own. Defibrillation is required to reverse cardiac arrest and restore functional cardiac activity. It can be effective when applied soon after the onset of cardiac arrest.

EMS System—A comprehensive, coordinated arrangement of resources and functions which are organized to respond in a timely, staged manner to targeted medical emergencies, regardless of their cause and the patient’s ability to pay, and to minimize their physical and emotional impact.

Fee-for-service: A system in which a health care provider charges a fee for each service performed.

Discounted fee-for-service: A system in which a health care provider is paid on a fee-for-service basis, but agrees to a discount of the usual charges.

Health Maintenance Organization (HMO): An organized system of health care that provides directly or arranges for a comprehensive range of basic and supplemental health care services to a voluntarily enrolled group of persons under a prepayment plan (per person per month).

Public Education – Public education imparts knowledge or training in specific skills. For example, teaching CPR, how to call for help properly, bicycle safety or briefing public officials about the importance of your service to your community are all public education activities.

Public Information – Public information is “news.” For example, the facts about an issue of public concern or a major incident in your community, or routine communications such as announcing upcoming events, or a presentation on your annual budget and projected needs would all be considered public information.

Public Relations – Public relations is the process of shaping public opinion. Public relations is part of every aspect of your service, including public information and public education activities.

APPENDIX 1.
EMS Database Elements¹

NAME	DEFINITION
Age	Patient's age or best approximation
Agency/Unit Number	Number that identifies the agency and unit responding to an accident
Cause of Injury	External cause of injury
Chief Complaint	Statement of problem by patient or other
City of Residence	City or township of patient's residence
Crew Member One Number	Personnel certification/license number for first crew member
Crew Member One Type	Personnel certification/license level of first crew member
Crew Member Two Number	Personnel certification/license number for second crew member
Crew Member Two Type	Personnel certification/license level of crew member
Crew Member Three Number	Personnel certification/license number for third crew member
Crew Member Three Type	Personnel certification/license level of third crew member
Date of Birth	Patient's date of birth
Date Incident Reported	Date the call is first received by PSAP or other designated entity
Date Unit Notified	Date response unit is notified by EMS dispatch
Destination/Transferred to EMS responder providing this record	Health care facility or prehospital unit/home that received patient from
Destination Determination	Reason a transport destination was selected
Diastolic Pressure	Patient's diastolic blood pressure
Factors Affecting EMS Delivery	Special circumstances affecting the EMS response or delivery of care
Gender	Sex of patient/victim
Glasgow Coma Score (Total)	Patient's total Glasgow coma scale score
Glasgow Eye Opening Component	Patient's eye opening of the Glasgow coma scale
Glasgow Motor Component	Patient's motor component of the Glasgow coma scale

¹Uniform Prehospital EMS Data Consensus Development Conference.

NAME	DEFINITION
Glasgow Verbal Component	Patient's verbal component of the Glasgow coma scale
Incident Address	Address where patient was found, or address to which unit responded
Incident City	City or township where patient was found
Incident County	County or parish where patient was found
Incident Number	Unique number for each incident reported to dispatch
Incident/Patient Dis position	End result of EMS response
Incident State	State, territory, province or district where patient found
Initial Cardiac Rhythm	Initial monitored cardiac rhythm as interpreted by EMS personnel
Injury Description	Clinical description of injury type and body
Injury Intent	Intent of individual inflicting injury
Lights and Sirens to Scene	The use of lights and sirens to scene
Lights and/or Sirens From Scene	Use of lights and/or sirens from the scene
Location Type	Type of location of incident/rural, inner city, etc.
Medication Name	Medication name
Onset Date	Date of onset of symptoms or injury date
Onset Time	Time of onset of symptoms or injury time
Patient Care Record Number	Unique number for each patient care record (PCR)
Patient Street Address	Patient's street address
Pre-existing Condition	Pre-existing medical conditions known to the provider
Procedure Attempts	Total number of attempts for each procedure attempted, regardless of success
Procedure or Treatment Name	Identification of procedure attempted or performed on patient
Provider of First CPR	Person who performed first CPR on patient
Provider Impression	Provider's clinical impression which led to the treatment given to the patient
Pulse Rate	Patient's palpated or auscultated pulse rate expressed in beats per minute
Race/Ethnicity	Patient's racial and ethnic origin

NAME	DEFINITION
Respiratory Effort	Patient's respiratory effort expressed in phases 0 - 3
Respiratory Rate	Unassisted patient respiratory rate expressed in breaths per minute
Response Number	Unique number for each individual response by a response unit to an incident
Return of Spontaneous Circulation	Whether a palpable pulse of blood pressure was restored following cardiac arrest and resuscitation in the field
Revised Trauma Score	Patient's revised trauma score
Rhythm at Destination	Monitored cardiac rhythm upon arrival at destination
Safety Equipment	Safety equipment in use by patient at time of injury
Service Type	Type of service requested by initial caller
Signs and Symptoms Present	Signs and symptoms reported to or observed by provider
Skin Perfusion	Patient's skin perfusion expressed as normal or decreased
Social Security Number	Patient's Social Security number
State of Residence	State, territory, province, or District of Columbia, where patient resides
Suspected Alcohol/Drug Use	Suspected alcohol or drug use by patient
Systolic Blood Pressure	Patient's systolic blood pressure
Telephone Number	Patient's primary telephone number
Time Back in Service	Time that response unit was back in service, available for response
Time CPR Discontinued	Time at which medical control or responding unit terminated resuscitation efforts in the field
Time Dispatch Notified	Time of first connection with EMS dispatch
Time Incident Reported	Time call was first received by dispatch or other designated entity
Time of Arrival at Destination	Time when patient arrived at destination or transfer point
Time of Arrival at Patient	Time response personnel established first direct contact with patient
Time of Arrival at Scene	Time EMS response unit stopped physical motion at scene (last place unit or vehicle stops prior to assessing patient)

NAME	DEFINITION
Time of First CPR	Best estimate of time of first CPR
Time of First Defibrillatory Shock	Time of first defibrillatory shock
Time of Cardiac Arrest	Time of cardiac arrest (witnessed)
Time Transport Unit Left Scene	Time transport unit physically left the scene in transport
Time Unit Notified	Time response unit was notified by EMS dispatch
Time Unit Responding	Time response unit began physical motion
Treatment Authorization	Source of authorization for treatment
Vehicle Type	Type of vehicle that responded to incident
Witness of Cardiac Arrest	Person who witnessed cardiac arrest
Zip Code of Residence	Zip code of patient's residence