GEOGRAPHIC INFORMATION SYSTEM EMERGENCY SERVICES RESPONSE CAPABILITIES ANALYSIS

A PROPOSAL

International Association of Fire Fighters
1750 New York Avenue, N.W.
Washington, DC 20006

CITY OF KEY WEST

FLORIDA

MAY 20, 2014

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Dedication

THIS REPORT IS DEDICATED TO THE CITIZENS OF THE CITY OF KEY WEST, WHO DESERVE THE MOST EFFICIENT AND EFFECTIVE EMERGENCY MEDICAL SERVICES AVAILABLE.

Acknowledgements

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Executive Summary

The International Association of Fire Fighters (IAFF) Headquarters was engaged in March 2014 by the Key West Professional Fire Fighters Association Local 1424 to develop an Emergency Medical Services (EMS) integration proposal describing the feasibility of adding 9-1-1 EMS transport services to the Fire Department. The IAFF was contacted by Local 1424 to prepare this document in response to a proposal for EMS service presented to the City by the TriData Corporation. The IAFF reviewed the organization of the Key West Fire Department, herein to be referred to as the Department, the current response capabilities, performed an assessment of all requests for EMS service, and examined the geography and demographics of the City.

This proposal provides a number of recommendations that will improve the services the Department provides to the citizens and visitors of the City, as well as streamline the Department's capabilities to respond to any emergency situations from small incidents to large scale disasters, both natural and man-made. If these recommendations are implemented, the Department's response to medical, fire, and rescue emergencies will be dramatically improved by allowing firefighters to provide a more advanced level of care. By enhancing the service level provided by the Department from Basic Life Support (BLS) first response to an all Advanced Life Support (ALS) transport capable agency with matching first response, the Department will be able to better serve the population of the City. Local 1424 also expressed interest in exploring the potential costs associated with expanding their service provision to include Advanced Life Support (ALS) response and transport.

The Department provides fire protection and BLS first response to the City of Key West, Florida and is located in Monroe County. According to the 2010 census the City of Key West had a population of 24,649[1] residents. The Department covers an area of 7.4 square miles with 5.9 square miles being land and the remainder being water. The area is located in a rural zip code.

Fire protection, technical rescue, and medical first response at the BLS level are currently provided by the Department. EMS transport is provided by a private for-profit EMS agency, Care Ambulance. The Department maintains three fire stations which are staffed 24 hours a day. The Department staffs full-time firefighters in a rotating schedule that has firefighters working a 24 hours on, 48 hours off rotation with one Kelly day a month. The Department maintains three front-line engine companies staffed with one officer and three firefighters and one ladder company staffed with one firefighter and one officer. Although the staffing of the ladder is inconsistent with NFPA 1710, the engines are staffed appropriately in compliance with the standard to perform suppression and rescue activities. Similarly the engines are staffed to

[1] 2010 U.S. Census

appropriately administer CPR in the team-centric manner currently recommended by the American Heart Association to improve survival rates for out-of-hospital cardiac arrests when supplemented with an ambulance crew of two.

A brief risk analysis was performed to assess the need for the addition of EMS transport to the Department's services. According to the 2010 U.S. Census, 17.7% of the population was in a vulnerable category. This category consists of persons under the age of 5 (4.9%) and persons 65 years of age and older (12.8%), but does not include the special needs population. Additionally 11.7% of the population was living at or below the poverty level[2]. The City has 14,016 housing units with the majority being single family residences (55.1%) and the remainder being multifamily ranging from 2 units to 20 or more (41.5%) and mobile homes (3.4%). Of these structures, 54.6% are of pre-1970 construction, and 19.3% of these were built in 1939 or earlier. In addition to these population demographics, the City is also at risk for natural and man-made disasters. The Monroe County Comprehensive Emergency Preparedness report, published in 2012, states that Monroe County has a high probability of being impacted by a variety of hazards including hurricanes, mass immigrations, transportation accidents, and tornados[3]. The County is at low risk for sink holes, cold emergencies, and nuclear power plant emergencies. These risks suggest that there is a need for the Department to increase its service delivery to include EMS transport.

Increasing the service level of the Department to include an ALS first response program, accompanied by ALS patient transport, would assist the City in being better prepared to effectively manage the aftermath of any large scale natural or man-made disaster by enhancing response and transport capabilities for the entire region. Furthermore, integration of EMS transport services into the Department would mean that command for an incident, where EMS transport is needed, can be centralized rather than spread out between two separate agencies.

In order to expand services, the Department would have to make a significant investment in personnel and equipment. The Department lacks ALS equipment and supplies and requires several essential resources such as a Division Chief of EMS, a billing agency, and a records system for tracking of medical supplies, among other things. This proposal will discuss a model for deployment, including the associated operational enhancements and costs.

This proposal is designed to be implemented over several phases in order to properly equip the Department to operate an EMS transport service. Because the Department currently requires operational personnel to maintain Basic Life Support (BLS) certification at a minimum, this proposal will focus on the necessary components to implement an ALS first response and transport service. The Department will need to lease or purchase a total of two new ambulances as front-line units, plus an additional two used mechanical reserve units to ensure minimal

[2] http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk
[3] Monroe County Comprehensive Emergency Preparedness report, 2012

interruption of service in the event of mechanical failures. Reserves units should be maintained in a "turnkey" ready state, meaning that other than the transfer of personal protective gear, these units will be equipped and stocked and available to respond if needed.

Phase I of the proposal should commence June 2, 2014 upon approval by the City and will involve the promoting of personnel to essential management positions, creating initial Standard Operating Procedures (SOPs), developing specifications for an ambulance fleet, contracting with a billing agency, developing EMS protocols, and applying for a Certificate of Public Convenience and Necessity (COPCN) from Monroe County. The Chief of the Department should be ready to have the Commission approve a promotional process for a Division Chief of EMS and a contract for a Medical Director by July 1, 2014.

The Department should promote a Division Chief of EMS that is experienced in managing an EMS system and is familiar with deploying EMS resources. The Department also needs a Medical Director. Once these two key positions have been filled, they should work together to fully develop the Department's EMS system.

Phase II should begin on June 16, 2014 and will involve formalizing committees that will be responsible for developing specific aspects of the new EMS system. These committees will be responsible for a number of tasks, including but not limited to, developing detailed SOPs, formalizing and releasing ambulance and equipment specifications, creating medical protocols needed for an EMS transport service, and developing continuous quality improvement guidelines. In this phase, the Department should also work with the local government to modify hiring standards to make Paramedic certification a condition of employment for all new hires. The Department will need to hire a minimum of 16 Full-Time Equivalent (FTE) Firefighter/ Paramedics to begin service. This number of FTEs does not include the Division Chief of EMS or the Medical Director. Near the end of Phase II, the Department should be ready to solicit bids for ambulances. The Department could potentially expect to pay $1,410,378.00 for wages and benefits in year one of service for 16 full-time employees ($1,233,968.00), including the Division Chief of EMS ($130,000) and a Medical Director ($46,410.00).

Phase III should begin August 20, 2014 and will involve the Department procuring the fleet of ambulances. In Phase II, the Department should have designed and created a plan addressing the specific needs of the ambulance fleet. Bids for construction of the fleet should be received and reviewed in accordance with local regulations. If the bids are received, reviewed and approved in a timely manner, the fleet may be ordered and delivered within a year. Currently, ambulance manufacturers can deliver ambulances in three to nine months depending on the manufacturer, size of order, and chassis availability. In order to secure the best deal possible, the Department should consider purchasing the "best-value bid" rather than the lowest bid. A best-value bid means that the Department or City could award bids to a more expensive

vendor because of better features, quality, or warranty and technical support options. Lower bids typically offer fewer incentives and limited warranties.

Phase IV involves the hiring and training of currently certified Paramedics. Additionally, by this time, the Department should have completed the SOPs, established medical protocols, and contracted with a billing agency. Following the hiring of employees, additional training should be provided for all responders, as needed. In order to attract certified and experienced Firefighter/ Paramedics, the Department should strongly consider implementing a lateral transfer incentive so veteran Firefighter/ Paramedics from other agencies may be persuaded to apply.

Phase V of integration involves the Department implementing EMS transport and replacing Care Ambulance as the primary transport agency on August 1, 2015. In the year following EMS integration the Department can expect to spend $1,512,109.24 in annual operating costs.

Purchasing of a fleet of four fully stocked ambulances will cost approximately $750,650.32. This includes both capital and non-capital equipment and supplies. The Department also has the option to lease the ambulances. When a municipality leases, it is not the same as a traditional lease for a personal vehicle. It is a municipal loan with a $1.00 buy-out option at the completion of the lease term. Leases are available in 3-, 5-, and 7-year increments at an interest rate that is dependent on the municipality's bond rating. It is infrequent for the interest rate to exceed 3% and payments are typically made once a year. Under these 3-, 5-, and 7-year lease options, the Department could purchase ambulances for $243,076.48, $154,727.90, or $117,250.59 respectively. These prices only include the cost of the ambulance plus cardiac monitors and reusable equipment such as patient cots, stair chairs, and backboards. The price does not include perishable or one-use items. This way, the Department avoids paying costly interest on disposable items with a limited shelf life. If the lease option is selected, the Department will need to spend an additional $83,302.08 to stock an ambulance with perishable supplies. An additional estimated $3,600.00 for oxygen and $27,693.00 for disposable medical supplies can also be expected annually.

It was possible to produce an estimate of revenue generation for the Department by reviewing historical data on requests for EMS service. However, age demographics were unavailable due to patient privacy laws. In Key West, a two-month average of EMS responses revealed the Department could potentially transport percentages of patients in the following categories BLS: 25.21%, ALS: 36.4%, and ALS2: 0..43%. Additionally, requests for EMS service that result in a transport are also able to submit for mileage which is assessed from the location the patient was placed into the ambulance to delivery at a hospital. An assumption for distance traveled with a patient were made by using the average travel distance from fire stations to the hospital, as pick-up points for patients were too numerous to individually calculate. For this proposal, rates were assessed using the Medicare Ambulance Fee schedule, as it is potentially the only

publically available ambulance transport fee schedule.

Using the fee schedule, it was estimated that in 2013, if EMS transport revenue was collected from 100% of those transported, that the Department could generate an estimated $1,004,007.95 in gross annual revenue, minus 8% for the billing agency. Net collections would then be $923,687.31. However, the Medicare Ambulance Fee schedule is generally the lowest cost fee schedule and it is atypical to collect 100% revenue. It is legally allowable, and encouraged, that the Department selects rates that are above the Medicare rates in order to maximize revenue. Additionally, many fire-based EMS systems are beginning to directly invoice patients for services delivered that do not result in a transport to the hospital- such as lift assists, administration of medication during diabetic emergencies, and other interventions. Although these invoices are typically low in cost, they still offer a means of revenue recovery for services and materials.

In conclusion, the City should add ALS EMS transport to the menu of services provided to the residents and visitors of the area. The addition of EMS transport will dramatically improve the level of service the Department offers. In addition to a more efficient distribution of resources and improved disaster mitigation capabilities, it will also present an appreciable revenue stream for the Department that has not been realized before. Furthermore, these additional resources will provide the Department with supplementary personnel available to respond to incidents requiring a greater number of firefighters needed to mitigate high hazard incidents.

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Background

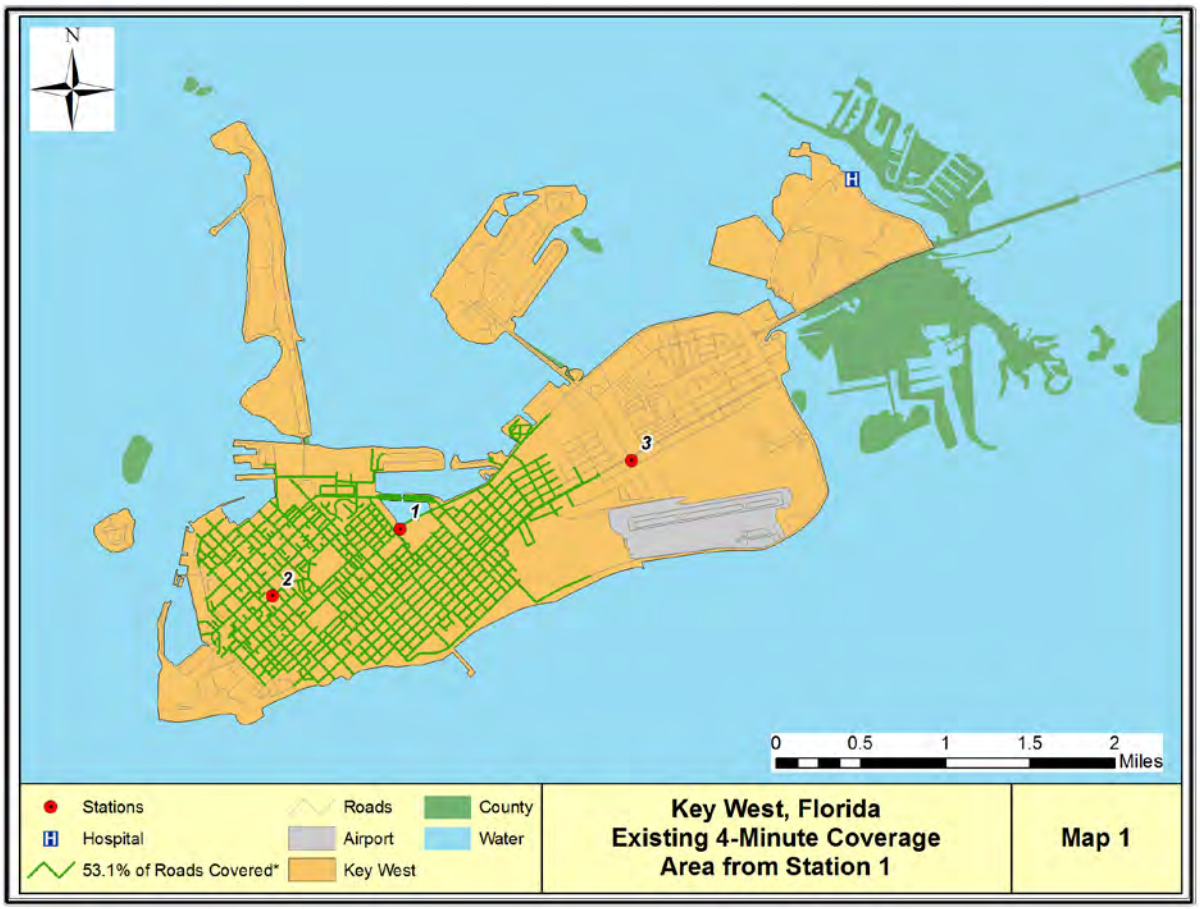
The Department provides fire protection and BLS first response to the City of Key West, Florida and is located in Monroe County. According to the 2010 census, The City of Key West had a population of 24,649[4]. The Department covers an area of 7.4 square miles with 5.9 square miles being land and the remainder being water. This provides an estimated population density of approximately 4,411.8 residents per square mile in the City. The area is also in a rural zip code. The Medicare Fee schedule allows for a higher rate to be charged in rural areas.

In the City, EMS transport is provided by a private, for-profit EMS agency, Care Ambulance. The Department maintains three fire stations which are staffed 24 hours a day. The Department staffs full-time firefighters in a rotating schedule working 24 hours on, 48 hours off, with one Kelly day per month. The Department staffs three fire engines with one officer and three firefighters and one ladder truck with one officer and one firefighter.

A brief risk analysis was performed to assess the need for the addition of EMS transport to the Department's service provision menu. According to the 2010 U.S. Census, 17.7% of the population was in a vulnerable category. This category consists of persons under the age of 5 (4.9%) and persons 65 years of age and older (12.8%), but does not include the special needs population. Additionally, 11.7% of the population was living at or below the poverty level. The City has 14,016 housing units with the majority being single family residences (55.1%), the remainder being multifamily ranging from 2 units to 20 or more (41.5%), and mobile homes (3.4%). Of these structures 54.6% are of pre-1970 construction, and 19.3% of these built in 1939 or earlier. In addition to these population demographics the City is at risk for natural and man-made disasters. The Monroe County Comprehensive Emergency Preparedness report, published in 2012, states that Monroe County has a high probability of being impacted by a variety of hazards including hurricanes, mass immigrations, transportation accidents, and tornadoes[5]. The County is at low risk for sink holes, cold emergencies, and nuclear power plant disasters. These risks suggest that there is a need for the Department to increase its service delivery to include EMS transport as this specific service provision will enhance the Department's ability to meet the needs of the community.

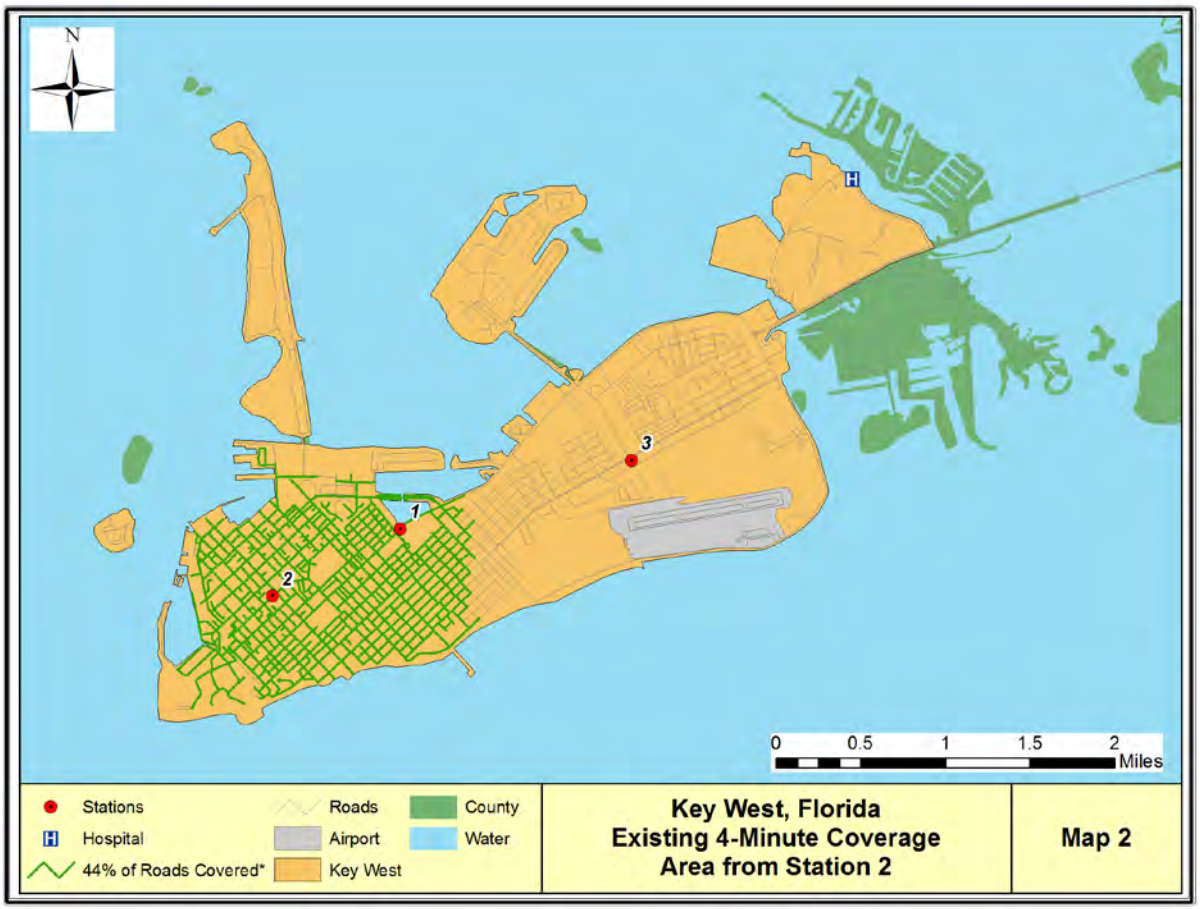
The Department is already well situated to provide timely EMS transport to the citizens and visitors of the City. Assuming all apparatus are responding from assigned quarters, the Department is able to provide coverage to 78.6% of roads in four minutes or less and 93.4% of roads in eight minutes or less. These travel times were modeled using ESRI ArcGIS version 10.1. Fire stations were identified on Geographic Information System (GIS) maps as starting points with vehicles traveling at posted road speeds.

[4] 2010 U.S. Census
[5] The Monroe County Comprehensive Emergency Preparedness, 2012



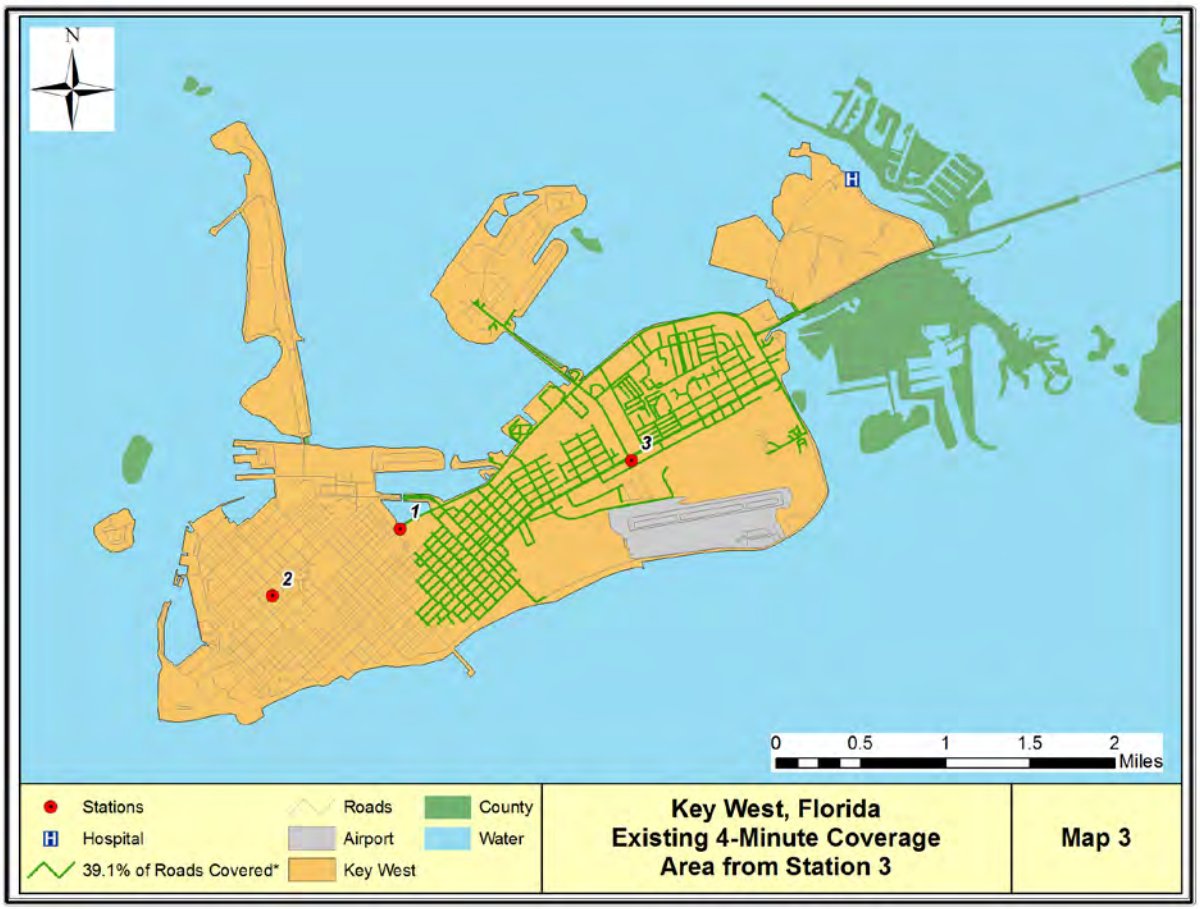
Map 1. Key West Fire Department 4-Minute Response Coverage from Station 1.

The Department can provide coverage from Station 1 to 53.1% of City roads within 4 minutes.



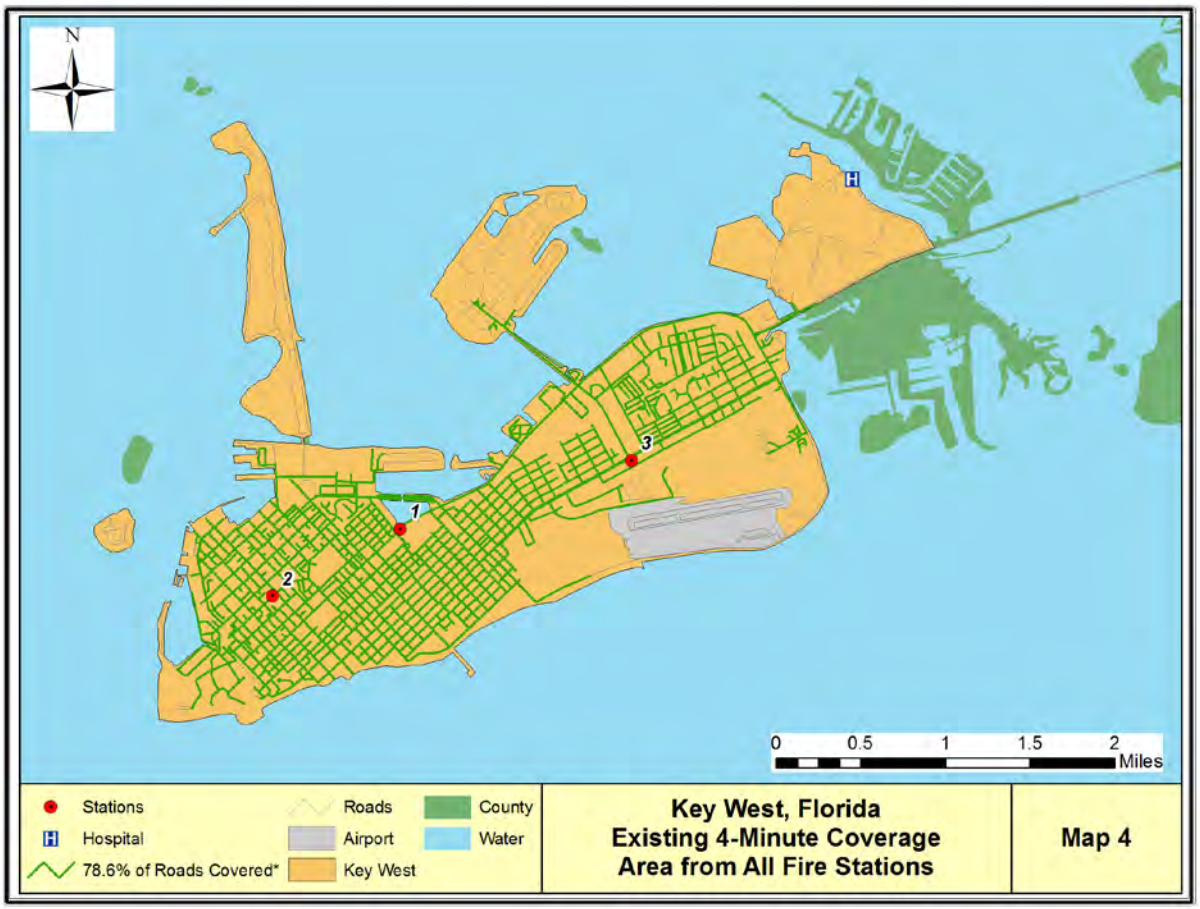
Map 2. Key West Fire Department 4-Minute Response Coverage from Station 2.

The Department can provide coverage from Station 2 to 44% of City Roads within 4minutes.



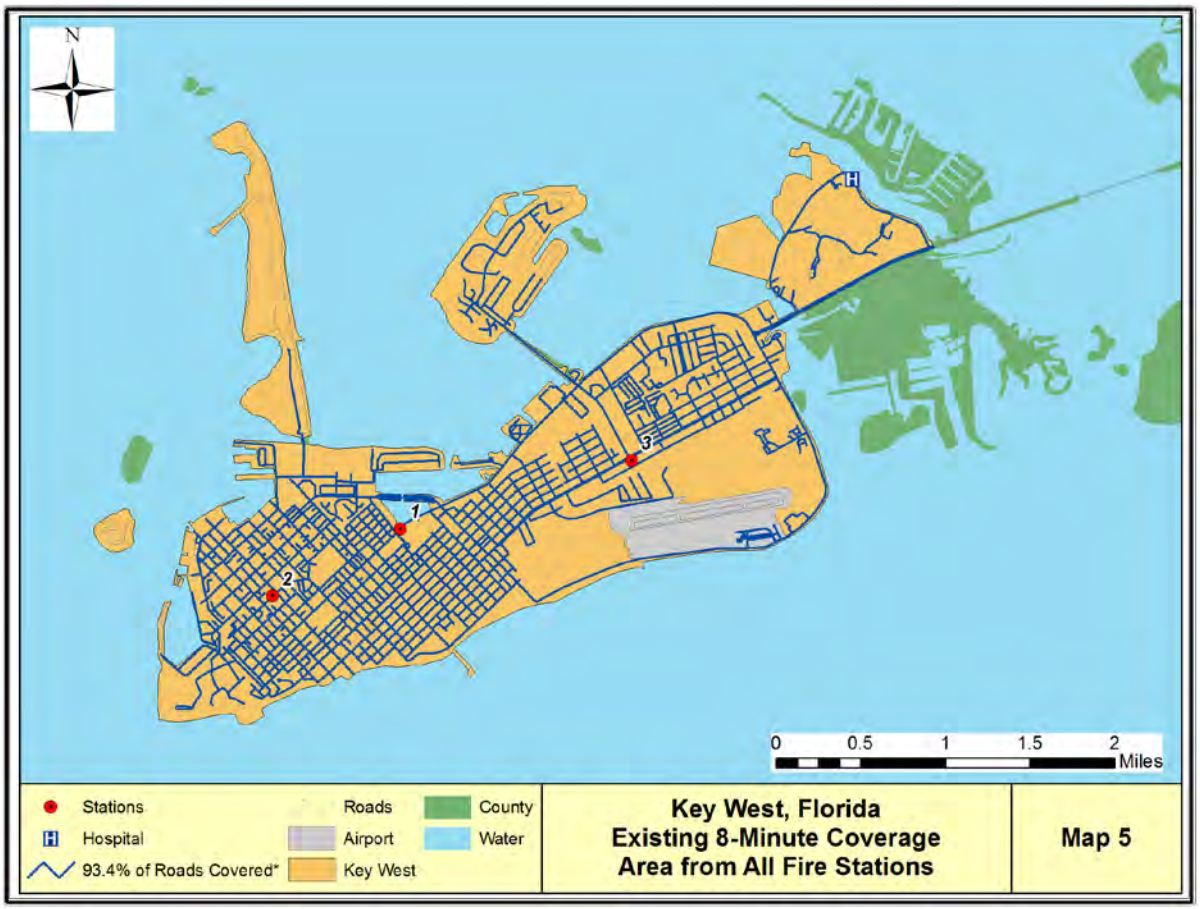
Map 3. Key West Fire Department 4-Minute Response Coverage from Station 3.

The Department can provide coverage from Station 3 to 39.1% of City roads within 4 minutes.



Map 4. Key West Fire Department 4-Minute Response Coverage from All Stations.

The Department can provide coverage from all stations to 78.6% of city roads within 4 minutes.



Map 5. Key West Fire Department 8-Minute Response Coverage from All Stations.

The Department can provide coverage from all stations to 93.4% of City roads within 8 minutes. This highlights how the Department is well situated to meet national standards for response to requests for EMS transport.

Fire Department EMS Operations

In recent years, the provision of emergency medical services has progressed from an amenity to a citizen-required service. More than 90% of career and combination fire departments provide some form of emergency medical care, making fire departments the largest group of prehospital EMS providers in North America. In many fire departments that deliver prehospital care, EMS calls can equate to over 75% of total call volume.

In an analysis of data from over 300 fire departments in the United States, first responder units, which are typically fire engines, arrived prior to ambulances approximately 80% of the time.[6] This is likely due to the fact that fire stations housing first responder units, which are equipped and staffed with dual-role firefighter/ emergency medical service technicians and supplies, are more centrally located and are able to affect a quicker response and provide life-saving procedures in advance of an ambulance. This reinforces why it is in the best interest of the public good for the fire department to provide EMS transport as well as first response.

The benefit of adding EMS transport to fire department operations is that fire departments are already geared towards rapid response and rapid intervention. Strategically located stations and personnel are positioned to deliver time critical response and effective fire suppression and are therefore equally situated to provide effective response to time critical requests for EMS service. Both fire suppression and EMS response are required by industry standards to have adequate personnel and resources operating on scene within 8 minutes[7]. In both fire suppression and EMS incidents, time is directly related to the amount of damage, either to the structure or the patient.

Before continuing, it is important to explain common private ambulance practices. It is rare that private ambulance companies solely provide emergency 9-1-1 patient care and transport. Frequently these companies provide a mixture of non-emergency inter-facility transports, both scheduled and unscheduled, along with 9-1-1 EMS response. In order to maximize revenue it is a common practice among these private companies to staff as few ambulances as possible to manage workloads. Because of the unpredictability of requests for 9-1-1 EMS service as well as low numbers of ambulances in field, there is a high probability that all ambulances may be engaged on non-emergency requests for service leaving none available for emergency requests. To increase the likelihood of having an ambulance available, private ambulance companies will frequently set a longer response time for arrival at the assigned destination. It is not uncommon in the private ambulance industry to see contractual response times for emergency requests be in the area of 12 to 15 minutes from time of initial dispatch. This practice gambles with the odds of

[6] Lori Moore-Merrell and others, Report on Residential EMS Field Experiments, (September, 2010); pp. 10.
[7] NFPA 1917: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments

requests for emergency service versus the availability of ambulances in order to increase profitable opportunities. This can place the population in danger.

This is exceedingly common in EMS patient care models where a fire department provides first response only and patient transport is provided by a private ambulance company. This is because private ambulance providers rely on the fire department's rapid response to the patient to justify a longer ambulance response time. This practice can and has, increased the likelihood of patients waiting longer for transport to the hospital. It also engages other emergency resources unnecessarily and poses a threat to the community. Fire departments that provide EMS transport do not typically provide inter-facility transports or dialysis transports and only provide transport for emergency requests for service. This increases the likelihood of having adequate resources available to respond when a citizen has a medical emergency.

One result of a prolonged ambulance response time is that a patient will be further delayed in reaching a medical facility to receive definitive care. This is especially dangerous for incidents of chest pain, stroke, and survivable cardiac arrest. Many times, patients experiencing symptoms associated with these events may not recognize the onset indicators and immediately call for assistance[8,9,10,11]. Acute Coronary Syndrome (ACS), or heart attack, is the number one leading cause of death in the United States. Experts agree that an ACS event should receive definitive care from a hospital within one hour of onset of symptoms. One study found that definitive care for ACS within one hour of onset improves survivability by 50% and 23% if definitive care was given within 3 hours[12].

Strokes, which are the number three cause of death in the U.S., as well as a leading cause of disability, also benefit from expedient treatment in definitive care. Ischemic stroke, which is a stroke caused from a blood clot, can be effectively treated if definitive care is received within 3 to 4.5 hours[13] of onset of symptoms. The sooner a patient receives definitive treatment from onset of symptoms, the less likely a patient is to suffer disability from this type of stroke. However, it is important to emphasize that before the time critical treatment can be administered to the patient in the hospital, there is a time intensive assessment that must be performed to ensure the patient is qualified to receive the treatment.

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[8] American Heart Association, *Heart Disease and Stroke Statistics-2005 update,* Dallas, TX: AHA 2005

[9] Time from Symptom Onset to treatment and outcomes after thrombolytic therapy. Newby LK, et al. *J Am Coll Cardiol.* 1996:27:1646-1655

[10] An International Perspective on the Time to Treatment of Acute Myocardial Infarction. Dracup, K. et al. *J Nurs Scholarsh* 2003;35:317-323

[11] Prehospital and In-hospital Delays in Acute Stroke Care. Evanson, KR, et al. *Neuroepidemiology* 2001;20:65-76

[12] Association of patient delays with symptoms, cardiac enzymes, and outcomes in acute myocardial infarction. Rawles, JM. Et al. *Eur Heart J.* 1990; 11:643-648.

[13] Thrombolysis with Alteplase 3 to 4.5 Hours after Acute Ischemic Stroke. Hacke, W. et al. *N Engl J Med.* 2008;359:1317-1329

The current benchmark for an ischemic stroke patient "door to needle"[14] is less than or equal to 60 minutes. However, Steps Against Recurrent Stroke (STARS) registry shows that the median door to needle time is 96 minutes or 1 hour and 36 minutes.[15]

Because fire department-provided EMS is typically reserved for emergency responses, there is an increased likelihood that a patient will receive an ambulance and a first responding fire apparatus in not only a timely manner, but also frequently at the same, or close to the same, time. This is extremely beneficial to the patient as most EMS responses, particularly the previously mentioned conditions, are labor intensive. Patients suffering from ACS should not perform any form of exertion as to minimize any damage that is occurring. Patients suffering from strokes are frequently unable to exert due to physical disabilities caused by the incident. An optimally sized crew is able to provide simultaneous interventions while assessment is being performed thereby reducing the on-scene time. Following completion of critical tasks, the crew can then facilitate a safe removal of the patient to the ambulance and minimize the risk of injury to patient and provider.[16]

One of the most labor intensive and time critical requests for EMS response is cardiac arrest, which affects 20-140 out of every 100,000 people. Traditionally, the American Heart Association (AHA) taught a method of cardiac resuscitation that involved single rescuer performance of prioritized action[17]. However, there was a gap between instruction and practice which led to confusion and may have potentially reduced survival. In reality providers respond and function in teams larger than two.

In 2010, the AHA released a newly revised guideline for cardiac resuscitation that focused on a team-centric approach. More important than this change was evidence-backed research that suggested that the manner in which CPR was being performed was inherently inefficient and only provided 10-30% of the normal blood flow to the heart and 30-40% to the brain[18,19]. This was linked to provider fatigue from administering chest compressions, and as such, these studies indicate that providers should be rotated to ensure effective depth and rhythm of chest compressions. Consensus documents from the AHA recommend that providers should rotate

[14] "Door to Needle" is an industry specific term that refers to the time the patient entered the emergency department to the time the received the treatment. A drug named recombinant tissue plasminogen activator (rt-PA) is utilized to dissolve the thrombosis causing the stroke. Current FDA approvals limit this drug's use to 3-4.5 hours from initial symptoms and require a CT scan and labs before administration.

[15] Improving Door-to-Needle Times in Acute Ischemic Stroke: The Design and Rational for the American Heart Association/American Stroke Association's Target: Stroke Initiative. Fonarow, Gregg, et al. *Stroke* 2011;42:00-00

[16] National Institute of Standards and Technology Report on Residential EMS Field Experiments September, 2010

[17] Highlights of the 2010 American Heart Association Guidelines for CPR and ECC

[18] Determinants of Blood Flow during Cardiac Resuscitation in Dogs. Halperin, HR et al. *Circulation* 1986;73:539-550

[19] Increased Cortical Cerebral Blood Flow with LUCAS, a New Device for Mechanical Chest Compressions Compared to Standard External Compressions during Experimental Cardiopulmonary Resuscitation. Rubertson S, et al. *Resuscitation*. 2005;65:357-363

with every two-minute cycle of CPR. It was also recommended that requests for EMS service for cardiac arrest also have a team leader to organize priorities and direct resources as they arrive or are needed. The team leader would also be responsible for identifying symptoms of fatigue and making appropriate assignment adjustments to ensure maximally efficient CPR.

Although the AHA and other researchers have not identified what an optimally sized crew for effective team-centric CPR should be, some consensus literature from AHA has mentioned that five providers were best suited to perform resuscitation. However, providers may be required to perform multiple tasks. Industry best practices, through the guidance of Medical Directors, have suggested six providers would be most successful in minimizing confusion and redundancy.

An EMS crew consisting of 6 personnel would require 4 personnel arriving with the first responding fire apparatus and 2 with the ambulance.[20] For an all-ALS system, two of the six should be Paramedics, with a minimum of one assigned to each of the responding apparatus. Some ALS systems require two Paramedics on the ambulance and a minimum of one on the first responding fire apparatus. However, these deployment options are determined by State directive or Medical Director's discretion. Regardless of the make-up of the EMS certification level of the providers on scene, an ALS integrated cardiac arrest response should provide for the following: a lead provider, an airway manager, two providers to interchangeably deliver chest compressions, a provider to establish an intravenous medication line and administer medications, and a provider to operate the monitor.

To support the EMS mission, the Department will not only need to increase its daily staffing to meet the needs of an integrated EMS transport system, it will also need to increase the daily staffing needed to perform time critical tasks to ensure more effective lifesaving procedures. By integrating EMS transport, the Department will also be able to enhance service by guaranteeing that patient care-associated training is received by all employees.

[20] NFPA 1917: Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments

Ambulance Distribution

Before discussing how many ambulances the Department should deploy, it is important to discuss two basic concepts of ambulance deployment- distribution and depth of coverage. Distribution describes the geographic area that emergency units, in this case ambulances, can cover. Stations should be located in such a manner as to ensure expedient response from the station to the scene in four minutes (240 seconds) or less 90% of the time for EMS first response by any unit, BLS transport unit or first fire engine for a fire[21], and eight minutes (480 seconds) or less 90% of the time for an ALS transport or full alarm assignment for a fire.[22] In addressing distribution, it is important to have a certain degree of overlap in coverage areas to ensure that the aforementioned response benchmarks can be met. Depth of coverage refers to the number of simultaneous incidents that the Department is capable of responding to. Ideally, departments should be staffed and equipped in such a manner as to be able to handle a number of simultaneous incidents within stated response time goals.

These benchmark distribution and depth values are defined by industry standards in the National Fire Protection Association (NFPA) 1710: *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. However, due to geography and population factors they may not be achievable or appropriate for all departments and communities. As such the Department should determine what a desirable and achievable performance benchmark is as determined by examining its current responses and identifying the 90th percentile response time. Fire Stations in Key West appear to be appropriately located to meet NFPA 1710 performance objectives. As previously stated, the stations are located in such a manner as to provide 93.4% coverage of all surface roads in eight minutes or less and 44% in four minutes or less. With the exception of the ladder truck, all suppression apparatus are appropriately staffed[23, 24, 25]. In order to add EMS transport the Department will require additional personnel to staff ambulances. Once these minimal personnel criteria have been achieved and ambulances have been purchased, the Department will be well equipped to deal with multiple simultaneous incidents. Due to call volume demands and location of existing fire stations, it would be appropriate for the Department to use statically deployed ambulances to provide prompt coverage to the City.

[21] NFPA 1710 Standard: EMS First Responder 5.3.3.3.2, BLS Transport 5.3.3.3.3*, First Engine 5.2.4.1.1
[22] NFPA 1710 Standard: ALS Transport 5.3.3.3.3*, Full Alarm Assignment 5.2.4.2.1
[23] National Institute of Standards and Technology Report on Residential Fireground Field Experiments April, 2010
[24] National Institute of Standards and Technology Report on High-Rise Fireground Field Experiments April, 2013
[25] National Institute of Standards and Technology Report on EMS Field Experiments September, 2010

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EMS GAP Analysis

In order to expand service to include EMS transport, the City and the Department would need to make a significant investment in personnel and equipment. An explanation of operational needs has been included in order to inform decision makers of the intricacies of service. This proposal will discuss one model for deployment, and with it, the requirements and associated costs to provide ALS transport. This proposal speaks directly to the implementation of an ALS service as it represents the largest investment and is the apex of prehospital care. If the Department and City wish to implement a BLS level of transport, costs and supplies have been included in the Appendices.

Given the Department's current staffing and certification levels, it will be critical for the Department to hire employees who already possess Paramedic and NFPA Firefighter II certification. It would also be beneficial for the Department to offer Paramedic training to current employees. However, as an incentive to existing employees, the Department should take appropriate steps to assure employees that increasing certification levels is voluntary and non-punitive. The Department should also consider offering pay incentives. Additionally, in order to transition from a BLS first responder service to an ALS transport service with consistent ALS first response, the Department will need to increase current staffing levels to accommodate the enhanced service. It is essential that the Department and decision makers understand the complexities involved in establishing a prehospital care transport service. This section will outline the minimal needs to accomplish that task prior to the implementation of the service.

Once the needs of the community and the Department have been identified, decision makers should work together to determine how service will be implemented, when and how fast capabilities will increase, and the deadline for the moratorium of primary service with Care Ambulance. Additionally, the Department should show due diligence in collecting information and understanding requirements for the initiation and maintenance of a public 9-1-1 transport service. During the preparation of this report, the IAFF has made every effort to collect and disseminate information regarding the laws surrounding a publicly managed 9-1-1 transport service. Ultimately, it will be the responsibility of the Department to ensure all applicable laws and rules are followed throughout this transition and going forward.

This report will discuss an immediate implementation, where within an established time frame, Care Ambulance will be allowed to continue service while the Department prepares to assume EMS transport. Then, on a pre-arranged day and time, Care Ambulance service will cease and the Department's service will begin.

The implementation of EMS transportation, as with any sweeping service change, is not simply a matter of employing the right people, purchasing equipment and supplies, and then placing the whole operation in service. Instead it will involve a period of strategic planning that includes

creating Standard Operating Guidelines (SOGs), developing EMS medical protocols, identifying risks and ways to address those risks, developing contingency plans, budgeting, educational planning for personnel and the community, making human resource decisions aimed at attracting experienced providers to the Department who can fill the experience gap, and finally, stand-alone implementation.

Division Chief of EMS

The Department should promote an employee to a Division Chief of EMS within the Department. This position is intended to perform the administrative tasks necessary for a successful prehospital program. This position will be an integral part of the operation, and will work in conjunction with the Medical Director. Once the Department makes the transition from first response to transport there will be a number of additional tasks that must be carefully managed and monitored. This list includes, but is not limited to, managing a dynamic medical supply chain, tracking patient care records, working with a billing agency, maintaining a larger supply of technical equipment and meeting the required service intervals to maintain them, collecting and analyzing data that is pertinent to the function and operation of the Division of EMS, and acting as liaison between the Department, the Medical Director, and the hospital in regards to infectious exposure notifications and patient care misadventures. The Division Chief of EMS should also be responsible for handling and investigating patient and citizen complaints. Because the Division Chief of EMS will be responsible for the management of an ALS system, it would be advisable to hire a candidate that holds Paramedic certification, has been a Paramedic field provider for a minimum of five years and possesses supervisory experience. Experience does not always have to be with the Department.

The Division Chief of EMS will also be required to act as the Health Insurance Portability and Accountability Act (HIPAA) Compliance Officer. HIPAA compliance and a Department-wide annual update are required in order to bill Medicare. This position is responsible for maintaining HIPAA compliance, conducting or directing periodic training for employees, assessing compliance and developing standards. Additionally, a compliance officer is responsible for ensuring any agency with access to medical records, such as billing companies, are using the information appropriately in accordance with the HIPAA rules. A Compliance Officer is also responsible for the development and implementation of contingency plans in the event that information is transmitted inappropriately or if the information's security has been compromised.

In addition to the HIPAA Compliance responsibilities, it is also important for the Division Chief of EMS to be familiar with and understand the intricacies of EMS billing. How and why the Department should contract a billing agency rather than hiring a civilian for EMS billing will be discussed later in this report. The Division Chief of EMS will need to ensure that billing processes and claims are being performed fairly, equitably and lawfully by the billing company. Current Medicare billing rules indicate that providers that have contracted with a billing agency to manage their revenue collection are just as culpable for ensuring the law is followed as the billing agency itself.

The future Division Chief of EMS should have experience with the grant writing process, even if the Department currently has an employee assigned for this responsibility. Grants will be necessary for the Department to offset costs associated with purchasing apparatus and

equipment. Grant monies, will help ease the Department's burden of the initial start-up costs associated with EMS integration.

By employing a person with extensive knowledge in the operation of a prehospital care program, the Division Chief of EMS will be instrumental in establishing criteria to provide service, purchase equipment, and hire and retain EMS providers. This position will also be instrumental in selecting an appropriate Medical Director for the Department. Because the Department has already shown a desire to grow its services, it would be best if the Department employed a dynamic Division Chief of EMS who will, or has proven in previous positions, to be a forward thinker who stays up-to-date with current best practices and can adapt these practices into the EMS protocols.

The Division Chief of EMS should also be certified to provide EMS instruction for the Department since they will be responsible for introducing new procedures and equipment to the Department. As such, the Department should also require the candidate to have completed or complete, within one year of employment, "Developing Course Content" offered by the National Fire Academy or a comparable entity.

These minimum criteria will support the Department in achieving and maintaining a high performance EMS system by encouraging Department leadership to stay informed of current practices in the field of prehospital care.

Medical Director

The Department currently operates under Care Ambulance's Medical Director. The Department will need to contract with a physician to provide medical direction once service has been severed. It is not uncommon for departments to share a Medical Director. However, it is important to emphasize that, regardless of the arrangement, the Medical Director should always act in the best interest of the Department and the community.

It will not be necessary for the Medical Director to be an officer with the Department, but this does not exclude the position from being an integral part of the leadership matrix. In the prehospital environment, EMS providers operate as an extension of a licensed physician, with standing orders, or protocols, when delivering patient care. The physician who will become the Medical Director for the Department will be responsible for the creation of protocols, medical oversight via Continuous Quality Improvement, and will be a key asset in the development of training regimens, especially with the addition of new skills.

The Medical Director should be an involved and integral member of the chain of command who advises the administration on medical issues and unusual medical occurrences, but maintains a high-level authority over all clinical and patient care aspects of EMS resources. A more specific job description can be developed to meet local needs. The Medical Director should have the ability to immediately limit the patient care activities of providers that deviate from protocols and/or do not meet training standards. However, the Medical Director should have a protocol that allows for justifiable variance in the performance of protocols. This allows for flexibility in the provision of care and allows for practitioners to defend actions that may have deviated from protocol. This does not excuse or defend reckless behavior, but identifies the fact that all patient situations or encounters are different and that patient needs are not always consistent with in protocols.

The Medical Director should be Board Certified in Emergency Medicine and be clinically active in its performance. Additionally, the Medical Director should understand the designs and operations of EMS, be familiar with local and regional EMS activities, be familiar with the administrative and legislative processes that impact EMS, be familiar with the different scopes of practice, and be knowledgeable of local, regional and State mass casualty and disaster plans.[26] More information can be found in the Handbook for EMS Medical Directors, which was created by FEMA in March of 2012 and is included in the Appendices as a supplement for decision makers.

Per the State of Florida Department of Health, the Department has no flexibility regarding the purchasing of medications. Medications and other prescription devices are purchased through the Medical Director's license and DEA number. The State of Florida requires that the Department's

[26] Handbook for EMS Medical Directors. March 2012 FEMA page 21

Medical Director maintain the appropriate license and waivers to distribute prescription level medications.

Although the Medical Director is ultimately responsible for the licenses to provide patient care, the Department will need to understand the other associated requirements to operate a transport service. It will be of value for the administration, particularly the Division Chief of EMS, to know and understand what licenses and certificates are required.

Continuous Quality Improvement

One of the many EMS system components the Medical Director is responsible for, and that will be developed in concert with the Division Chief of EMS, is that of Continuous Quality Improvement (CQI). In this process, the Medical Director reviews data from the Patient Care Report (PCR) to assess protocol compliance, as well as any areas in need of improvement and/ or additional training. This can be accomplished in a number of ways, including but not limited to, direct review exclusively by the Medical Director or through a committee review. The committee may consist of Department providers, line officers, training officers and the Medical Director. Regardless of the design of the membership or size of the CQI committee, the Division Chief of EMS and Training Officer should be involved in the event training courses need to be developed or revised.

No matter what the configuration of the CQI process, the overall goal should be to observe treatment trends, look for inefficiencies and deficiencies, create strategies and educational opportunities, and adjust benchmarks with the goal of improving emergency medical services delivery.

The CQI process should evaluate a number of issues regarding patient care. Criteria will vary depending on the level of care provided by the Department as well as the conditions, both physical and environmental, that were present at the incident. Furthermore, the CQI process can be flexible in its assessment from the extreme of evaluating every incident through the CQI process or a sampling of incidents by type, percentage, or date. It is essential that the Medical Director decide how to direct inclusion criteria for incidents. Table 1, on the following page, has a minimal list of incident types that should be included in any CQI review process.

The results of a CQI process should be shared with the individual who provided the patient care or was the lead provider and with the provider's immediate supervisor, so it can be used in the annual review process. This knowledge will be a helpful tool for supervisors so that they can be aware of an employee's needs and use this to enhance their ability to act as a mentor. One thing CQI should never be used for, unless actions and care standards are reckless, purposeful, and habitual, is as a device for punitive action. The true purpose of a CQI process is constant improvement, as the name indicates. Using the CQI process for punitive action will be detrimental to the EMS transport program by creating a gap between administration and providers. Providers should embrace EMS service without reservation and trust that the CQI process is specifically a tool for improving the overall level of care.

Continuous Quality Improvement Assessment Criteria

High Risk Patient	High Risk Events
BLS	Physician on Scene
Deaths	Multi-Patient Incident
Restraints Used	Mass Gatherings
Refusals	Patient in Police Custody
Instances where the ambulance was Disregarded by First Responders	Tactical EMS Deployments
Births	Wilderness EMS Rescue
Airway Management	Technical EMS Rescue
ALS	
Rapid Sequence Intubation	
Chest Decompression	
Cardioversion	
Cardiac Arrest	
ST segment Elevation Myocardial Infarction (STEMI)	

Table 1. Continuous Quality Improvement Assessment Criteria. The above table shows the minimal criteria for a Continuous Quality Improvement process. Incidents that meet these criteria should be reviewed by the Medical Director and adjustments to protocols and Department operations made as necessary. It is important to note that the criteria mentioned above is a minimal list and can be expanded based on the medical needs and demands of the patients.

Just Culture

In regards to the CQI process, the Department should adopt the philosophy of a "Just Culture." In this instance "Just" refers to Justice, but the philosophy itself is part of the larger idea of a "Culture of Safety." A "Just Culture" recognizes that in many instances where a patient or provider was harmed, it was not done so in a malicious manner but rather as a result of simple human error or lack of detailed training. A "Just Culture" is an atmosphere of trust in which people are encouraged to provide essential safety-related information, but in which they are also clear about where the line must be drawn between acceptable and unacceptable behavior.[27] In this culture, practitioners are empowered to be accountable for their actions by realizing that even the most well trained provider will make mistakes and develop short cuts. These actions are not performed with malicious intent, and through CQI and self-reporting they can be identified and rectified without retribution, all while maintaining a zero tolerance for reckless behavior.

In the real world there are three behaviors that can be expected; human error (mistakes), at-risk behavior (short cuts), and intentional and repetitive reckless behavior. Although many believe that a "Just Culture" is an entirely non-punitive philosophy, it does not allow for reckless behavior. Reckless behavior is described as behavioral choices that consciously disregard a substantial and unjustifiable risk. In these instances existing models of "Just Culture" dictate inclusion of the disciplinary process. In the other instances, human error and at-risk behavior should be counseled and coached respectively. Although this is just an outline of the "Just Culture" and its inclusion into the larger "Culture of Safety," it is important to note that at the root of this is identifying the problem, identifying the issues that caused the action, creating manageable ways to correct and prevent the action, and implementing the corrective actions.[28]

A "Just Culture" and "Culture of Safety" would help to allow employees to identify unsafe acts and conditions and provide a forum with management without fear of retribution to address these issues, identify solutions and implement corrective actions. If applied correctly, this type of culture could potentially reduce sick and injury leave by creating a safe and content work force that knows it has been empowered to improve health and safety.

[27] "Just Culture" Presentation, The New Mexico Hospital Association.
[28], Patient Safety and the "Just Culture" presentation, David Marx, JD

"Just Culture" Accountability for Behaviors[29]

Human Error	At-Risk Behavior	Reckless Behavior
Inadvertent Action	**Unintentional Risk Taking**	**Intentional Risk Taking**
Manage Through Changes In:	*Manage Through:*	*Manage Through:*
Processes	Removing Incentives for At-Risk Behavior	Remedial Actions
Procedures	Create Incentives for Healthy Behaviors	Punitive Actions
Training	Increasing Situational Awareness	
Design		
Counsel	**Coach**	**Punish**

Table 2. Just Culture Accountability of Behaviors. This table displays how aspects of human behavior should ideally be handled in a "Just Culture." The basic idea behind a "Just Culture" is to create an open and fair culture that is based on identifying issues and behaviors that negatively impact the health and safety of patients and providers. A combination of the CQI process and self-reporting can create strategies to correct and improve these issues and behaviors for the benefit of the Department.

Ideally the findings of the CQI process should be unavailable to Freedom of Information Act (FOIA) requests with the exception of those dealing with reckless behavior. However, many states have a Peer Review law that protects findings in a CQI forum from FOIA only in regards to hospital caregivers and not regarding prehospital care practitioners. The Department should request an opinion from the Florida's Attorney General's office on this matter. This in effect may limit any immunity in the event of human error or unintentional at-risk behavior. Although this does not negate the need for a "Just Culture and "Culture of Safety," it is certainly in the Department's best interest to be familiar with the State and Federal Laws regarding immunity and peer review.

[29] Patient Safety and the "Just Culture" presentation, David Marx, JD

EMS Billing

When the Department begins transport service it will be necessary to bill patients for the EMS services that have been received in order to offset the cost of service provision. Although some may speculate that they are paying taxes for the service, it should be made clear that tax revenues support preparedness and availability of the service, rapid response, and early intervention but not for the transport service. Patient transportation is typically a user fee-supported service. This tax revenue versus user fee difference can be explained by looking at how fire suppression or preventative services benefit a "community" and an EMS response with transport benefits an individual. If a fire is not extinguished it will spread to adjacent occupancies and potentially threaten a large area and multiple taxpayers. However, most medical emergencies remain unique to the individual and do not "spread" to other taxpayers. As such, it is appropriate for the Department to charge a user fee for the specific, and typically individual, response to a request for EMS and transport service.

Because the Department will be providing a municipally-based service there are a variety of options that can be utilized for billing patients. The most frequent billing method is that of "insurance only billing." In this option, unless the patient has no insurance or the insurance company elects to send the bill to the patient, the patient receives no bill for service. For the majority of bills sent to an insurance company the patient will not be aware that they have been billed for service, as typically there is no co-pay required for non-Medicare emergency transport services. The Department should also be aware that private insurance companies do not typically pay the bill in its entirety and frequently pay a negotiated or "assigned" amount just above the approved Medicare rate for the State and Region, or may deny payment all together.

For Medicare patients, the Centers for Medicare and Medicaid Services (CMS) uses a legislated fee schedule based on the type of transport service provided plus mileage. The manner in which CMS pays is different from a typical private insurance payment. Regardless of the amount billed for the service, Medicare is only required to pay 80% of the amount determined by the fee schedule for the level of service provided. The other 20% is to be paid by the patient as part of their cost-sharing plan. However, in the case of a municipal service, the co-payment is typically assumed to be covered by the amount a user has already paid in municipal taxes. The fee schedule itself is a set reimbursement list that is broken down by State, Region, and whether or not the service was provided in an urban, rural, or super rural community.

The Department can establish its own rates and fees and is not limited to charging only at Medicare rates. Charging higher than the Medicare rates would be advantageous, since the population of Key West that qualifies for Medicare, 65 years of age and older, is 12.8%[30]. Table 3, on the following page, displays the 2014 Medicare fee schedule rates for Key West, the City should not submit rates lower than these.

[30] Key West, Florida: State and County Quick Facts 2010 US Census

It should be noted that the Medicare rate typically covers fuel and equipment usage, but does not cover the actual cost of providing personnel and time. This is why the Department should set rates and fees at levels designed to generate revenues sufficient to offset the marginal costs of providing added services. To match rates to cost, the Department should examine a few sample emergency runs and identify the types of procedures and medications that would be used in the response, assessment, transport and transfer of one patient. This would include a minimum of two providers, medications, supplies, non-invasive and invasive procedures, supplies and medication delivery routes, and cost of fuel per mile. The cost for these should be calculated as the cost of the supplies and medications used plus the true cost of two employees for the estimated total time of a patient transport, which given the proximity to a hospital should be averaged around one work hour. This calculation will provide the base cost of a patient encounter and transport. Once the true cost of a patient encounter and transport has been determined, decision makers should consider adding a "value" amount to the service provided as a means of increasing revenue. Many business models generally add a minimum of 20% of the base cost of service as a value addition.

Generally, billing is reserved solely for transported patients. One exception is in-field pronouncement of death, which Medicare will pay at the BLS rate for service. Some agencies have started direct billing patients who were not transported, as these payments are typically denied by CMS and private insurance. In these instances, agencies have achieved a higher collection rate by charging minimal fees such as $50-$100 dollars. Residents and visitors typically feel it is easier to pay these nominal fees out of pocket rather than encounter collection issues with unpaid larger sums. This way, the City may recover some of the cost, at a minimum, versus none of the cost.

Medicare Billing Rates for Key West, Florida 2014

Code	Service	Adjusted Rate
A0425	Mileage	$10.85
A0429	BLS	$370.92
A0427	ALS	$440.47
A0433	ALS2	$637.53

Table 3. Medicare Rates for 2014. The above table shows the amount approved for payment in the 2014 CMS Ambulance Fee Schedule for the City. The mileage rate is paid at the posted rate and is accrued to the nearest 10^{th} of a mile. The total charge for the BLS, ALS, or ALS2 rate, plus mileage, will receive an 80% payment from Medicare leaving the other 20% to be paid by the patient. Typically this 20% is assumed to be equal to the municipal taxes paid by the patient. It is important to note that the Department may set its rates higher than the Medicare rates. However, if the patient is a Medicare patient, the Department can only collect at the Medicare rate. Furthermore, mileage is charged per the "load mile," which is considered to be from the point where the patient is placed in the ambulance until arrival at the final destination.

Another area that allows the Department some flexibility in billing is the decision to charge different rates for residents versus non-residents. In this situation, the residents of the City are

charged a lower rate than non-residents. This provides a means of acceptance from residents as they will look favorably on being charged a lower rate. Some jurisdictions only charge non-residents while absorbing the cost of service provided to residents. It is not the recommendation of this report to follow the latter option as the call volume and service provision will need adequate funding to be self-sustaining.

The Department needs to determine if it will “hard bill” or “soft bill” for service. Hard billing is a billing system where after several unsuccessful attempts are made to collect, the bill is submitted to a collections agency. In soft billing, after several unsuccessful attempts are made to collect a billed amount, the cost of those services is written off by the agency. Typically municipal departments engage in soft billing, which allows for more political support from residents; however there is a growing trend in municipally provided EMS where jurisdictions are soft billing resident patients but hard billing non-resident patients. If the Department opts to send unpaid bills to collections it should do so by contracting with a collections agency, as billing agencies do not typically perform this type of work. In lieu of using a collections agency, some departments and municipalities have used their legal department to perform this duty. If the Department uses a collection agency, there will be additional costs paid out to contractors for service. Even if both billing and collecting agencies are used it may be potentially more cost effective than the Department needing to hire for and maintain its own separate billing department.

It is strongly recommended that the Department contract with a billing agency. The process of billing is complicated and requires agencies to stay up to date on billing laws and practices. This may not be feasible for the Department to attempt in-house. EMS billing agencies will provide the Department with the assistance necessary to apply for a Medicare provider number, establish billing rates, develop HIPAA compliance, and many other items necessary for implementing an EMS transport service.

Billing agencies are typically paid by a department based on a percentage of actual collections so it will be important for the Department to select an agency that has a high collection rate and a low percentage charge.

Finding a Successful Billing Agency

When considering a billing agency it is important to determine how successful the agency is in collecting revenue for other departments. The Department should require that potential candidates show their raw and true collection rates using comparable departments, as well as the Revenue per Transport (RPT). Raw collection rate is simply the total revenue divided by the total charges and expressed as a percentage.

$$\frac{Total\ Revenue}{Total\ Charges} \times 100\% = Raw\ Collection\ Rate$$

Depending on rates charged, billing policies and patient demographics, this percentage should range from 50% to 70%.

The true collection rate, which is slightly more complex, more accurately reflects the billing agency's effectiveness in collecting the revenue that is actually "available."

$$\frac{Revenue + Contractual\ Adjustments + Resident\ Write\ offs}{Total\ Charges} \times 100\% = True\ collection\ rate$$

The true collection rate neutralizes the effects of higher rates, contractual adjustments, and resident write-offs and should range from 85% to 98% if Office of the Inspector General approved billing practices are used. Office of the Inspector General (OIG) Billing refers to the Federal OIG office that issues decisions regarding Medicare Billing. OIG billing decisions include the waivers of co-payments by patients transported by municipal EMS providers based on the assumption that their taxes are equal to the co-payment amount for services rendered.

A third method to assess the billing agencies effectiveness is to assess their Revenue per Transport (RPT). This value reflects the average revenue that is collected per patient transport across their entire client base. The RPT can also be assessed on an individual department basis as well. It would be in the best interest of the City and Department to see the total RPT as well as that of individual RPT for comparable cities. It is difficult to find identically comparable cities simply due to differing service demands and demographics. The Department and City should develop an acceptable range of comparison by taking call volumes and age demographics into consideration for potential comparable departments, as there may be a substantial range of RPTs dependent upon these factors.

Once the Department has selected a billing agency, leadership should hold regular meetings with the billing agency for the purpose of constantly monitoring billing rates and considering adjustment. Rates will fluctuate as cost of service and the economy changes. It is important to remember that low rates will yield high collection results but low net revenue, where much higher rates will yield low collection results, but potentially higher net revenue. The Department should consider finding a balance in their rates and bill aggressively to ensure an acceptable billing to revenue collection ratio.

A further consideration when selecting a billing agency is that some billing agencies may offer software and hardware for patient care reporting free of charge.

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Patient Care Reporting

The Department will require a patient care reporting system. It will be in the best interest of the Department to use an electronic Patient Care Report (ePCR). Depending on the system selected, this may increase the initial start-up costs of the EMS integration process. Some billing agencies provide their own software while others offer a menu of programs to choose from. Typically agencies that offer a menu of software options will provide the software and mobile reporting devices and collect a higher percentage of collections. However, this should not be the only deciding factor when selecting a billing company and an ePCR system.

The Department should select software that is produced by a company that securely stores the data, has the ability to retrieve data and generate operational and demographic reports, and can be used by the Medical Director to perform CQI, as well as generate data reports. Using an ePCR system will eliminate the need for local paper and data storage as well as eliminate the need for the Department or the City to make significant changes to their own computer operating systems, especially if the software allows wireless submission of reports. A key aspect of the data collected and stored by ePCR companies is that the companies do not assume ownership of the data. Data generated by an individual department is specifically the property of each department and should be surrendered in its entirety upon severance from the contract with the company. The Department should confirm this in writing. All manufacturers of ePCR software that store data should have secure data transmission and storage capabilities that meet or exceed HIPAA requirements for electronic transmission of records. The Department should also confirm that the ePCR manufacturer has offsite single or multiple backup locations to ensure that there is no data lost in the event of a system failure.

Using ePCR has been shown to improve collection rates due to the ease of data entry by field providers. It also contains defined data points that must be satisfied for the report to be closed successfully. This is essential because Medicare and insurance companies rely on certain benchmarks, as well as certain procedures performed, to be documented in reports to justify payment. Handwritten reports that must be “re-entered” into a computer data base can be entered faster into a computer by omitting certain benchmarks in order to hasten data entry. These omissions can cause billing claims to be denied due to lack of a justifiable medical need. Electronic reporting relies on real time, point of contact data entry, which eliminates the need to enter reports twice. It additionally facilitates error free data transfer to hospitals for the patient care record, which is frequently a problem with handwritten reports. It alleviates frustration of field providers, especially if the software can auto-generate information such as patient data for frequent callers, patient address information based on social security numbers, certain medicine doses, or record narratives.

Frequently, fire departments will seek to use an ePCR system that may be manufactured by the same company that is currently used to generate fire suppression reports and track day-to-day

operations data such as inspections or public education events. Although the simplicity of using only one data collection system is attractive, the Department should do its best to avoid this line of reasoning and find a system that best suits the needs of EMS field providers. The ePCR program selected should be easy to use and flow in a logical manner, while allowing for the user to move back and forth through the user fields without confusion or difficulty. The software should also be fully customizable with the exception of mandatory blocks that have been put in place due to State and National data collection requirements. It should also allow for any additional documents the Department will need for operations such as EMS treatment variance reports, controlled substance proof of use forms, refusals, and any other forms pertinent to patient care. Additionally, the software and selected mobile devices should be able to communicate with heart monitors wirelessly so that data from heart monitors can be captured and added to the patient care report.

Although it may seem like a daunting task to use two separate reporting systems, one for fire and another for EMS, it is possible with a brief adjustment period. A significant benefit is after the customization period is over, the software will predominantly operate independently. The majority of ePCR software available on the market now comes equipped with a number of prepared data report templates and is customizable so that administrators can pull any needed data from the data bank. Furthermore, there are a few ePCR systems that are now also capable of generating NFIRS reports. This is advantageous for field supervisors as they can generate reports immediately on the scene of an incident if necessary. The Department should seek software that can submit data wirelessly in an encrypted format and can also print directly to the emergency room printer or fax. This will eliminate the Department's need to purchase a hospital-based printer or place mobile printers on the ambulances. Selecting software that submits wirelessly also ensures that the report is submitted to the billing agency more quickly and with fewer errors, allowing for payments to be processed more quickly. Using a wire as a backup connection in the event no wireless signal is available is appropriate, but should not be a primary means of data transmission.

Operational Licensure and Certification

The Department will require a number of additional licenses and certifications to legally provide a transport service. Laws regarding the application for an ambulance service can be found in § 64J-1 of the Florida Administrative Code (FAC) and at the following web link to the Florida Department of Health (FDOH), http://www.floridahealth.gov/licensing-and-regulation/ems-service-provider-regulation-and-compliance/index.html. The Administration of the Department should contact the Florida Department of Health to confirm and/or request assistance with acquiring and completing the forms required for a prehospital provider to implement a transport service and to assess if there are any required fees for licensing. At a minimum, the above listed web link will provide a number of resources that explain what type of equipment should be on the ambulance.

The Department will first need to apply to the Monroe County Commission for a Certificate of Public Convenience and Necessity (COPCN). Once the COPCN is approved, the Department can apply for state licensure as an ambulance service.

The State of Florida, per Chapter 401.34 of the Florida Statutes, requires EMS services to pay fees for ambulance service licensure. The license fee for ALS service is $1,375.00 and an additional $25.00 vehicle permit fee per ambulance. The license is good for two years and the Department can expect an inspection within 90 days of licensure.

The Medical Director is required by the State of Florida to possess a valid Drug Enforcement Agency (DEA) license[31]. The appropriate forms can be found on the DEA Office of Diversion Control website using the "Application for Registration under Controlled Substances Act of 1970 for New Applicants." The Department and Medical Director may need Form 224 MLP-Ambulance Service. The fee for this application is $731 and is valid for three years. Frequently, municipal provider charges are waived. It is important to note that since the Medical Director usually holds a DEA license as a Practitioner, the Ambulance Service license may not be necessary. The Medical Director and/or Division Chief of EMS should contact the DEA Diversion Control Office directly for clarification.

Because the Department will be providing an ALS model it will be important for the Medical Director and the Department to be familiar with DEA Form-222. This form is required for ordering schedule 1 and 2 controlled substances. The forms can be ordered from the DEA Headquarters Registration Unit at 1-800-882-9539 or through the nearest DEA registration field office. The Department and the Medical Director should also familiarize themselves with the forms and procedures required to destroy/remove expired controlled substances and other medicines, as well as the State and Federal requirements for tracking controlled substance inventory and usage.

[31] §64J-1.004 Medical Direction (4) Duties and Responsibilities of the Medical Director (a)

The Department and the Medical Director will also need a Clinical Laboratory Improvement Amendments (CLIA) Certificate of Waiver. CLIA was passed by Congress in 1988 and established quality standards for all laboratory testing to ensure the accuracy, reliability, and timeliness of patient test results regardless of where the test was performed. Requirements are based on the complexity of the test and not the laboratory where the testing is performed. The CLIA waiver will give the Department the ability to perform in-field tests with human biological samples, such as blood glucose monitoring. A waived test is categorized as "simple laboratory examinations and procedures that have an insignificant risk of an erroneous result."[32] The CLIA waiver costs $150.00 and needs to be renewed every two years, however Florida may have additional fees or alternate expiration dates that could exceed the federal regulations. As such, it is imperative that the Division Chief of EMS verify with the Florida's Agency for Healthcare Administration. Because the Department is a not-for-profit local government laboratory that engages in limited public health testing, only one waiver will be required per renewal cycle.

The Department can be enrolled as a laboratory by completing FORM CMS-116 which can be found online at www.cms.hhs.gov/clia or from the State Survey Agency,

Agency for Healthcare Administration
Laboratory Licensing Unit
2727 Mahan Drive, Mail Stop 32
Tallahassee, FL 32308
(850)410-1511
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In addition to licensing the service and the ambulances, the Department will also need to apply to become a Medicare provider if it intends to bill Medicare for patient transports. Although a billing agency will be able to provide assistance for meeting necessary requirements, it is important that decision makers understand a few details about the application process. Without enrollment and approval as a Medicare supplier, the Department cannot be issued payment. To become an ambulance service supplier the Department will need to apply for its National Provider Identifier (NPI). The NPI paper application can be found at the web address http://www.cms.gov/Medicare/CMS-Forms/CMS-Forms/Downloads/CMS10114.pdf or electronically at https://nppes.cms.hhs.gov/NPPES/Welcome.do. The NPI number will be required to complete the Medicare billing application, CMS-855B. CMS-855B can be found on the CMS website at http://www.cms.gov/Medicare/CMS-Forms/CMS-Forms/downloads/CMS855B.pdf,or electronically using the Provider Enrollment, Chain and Ownership System (PECOS) https://pecos.cms.hhs.gov/pecos/login.do. This form may take upwards of 180 days to process depending on the method of transmission.

[32] Clinical Laboratory Improvement Amendments, How to Obtain a CLIA Certificate of Waiver. DHS/CMS 2006

It will be essential that the Department have its own, or use the City's, tax-ID number for this process. The Department will also need to have a billing company, state licenses, vehicle information such as type and Vehicle Identification Number (VIN), CLIA certification, and other information to complete the applications. As was mentioned earlier, a billing agency will be helpful in completing this process.

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Narcotic Security

As previously stated, since the Department will be operating as an ALS transport model it will be important to know how to order, track and dispose of controlled substances that will be used for pain management, seizure cessation, sedation and other situations. It will also be necessary for the Department to determine procedures to ensure the security of narcotics. Security of Medication can be found in §64J-1.021 of the FAC.

Many states require that narcotics be maintained under a two-lock system. In many instances a seal on the medication kit is considered one lock and the locks on the ambulance are the second. The Department should verify the State's recommendations for such applications. However, if possible, the narcotics should be secured in the medication kit. This keeps the narcotics portable, which is helpful for the patient and providers in situations that require prolonged extrication or removal. This will also provide additional safety to providers. By keeping all the pharmaceuticals in the medication kit it will increase the likelihood of the provider being able to remain in a seated position in the ambulance while treating a patient who requires pharmacological interventions. In the instances of patients who begin to actively seize in the ambulance during transport, having controlled pharmaceuticals in the kit will allow for a more rapid intervention than having to retrieve the medicine from a wall locker.

Regardless of the method for transporting controlled substances, any security methods chosen should include the ability to track. If the Department wishes to keep controlled substances in a medication kit, the kit should have a smaller sealable pouch on the interior specifically for these medications. The seals used should, size and space permitting, be security seals that cannot be resealed once broken and should also have a tracking number. This will ensure that any tampering is detectable and track-able. The pouch should be sealed and the main compartment of the bag where the controlled substances pouch is located should be sealed. The number on the main compartment seal should be recorded every shift rotation to ensure continuity. When the main compartment is opened, whether narcotics are used or not, the narcotics pouch seal and the new main seal should be recorded to monitor for discrepancies and ensure further continuity. Additionally, the zippers to the main controlled substances pouch and the main compartment of the medication kit should have a lockable zipper that ensures the zippers cannot be manipulated in such a manner as to allow controlled substances to be removed from the pouch either through direct removal or with a syringe. Figure 1 shows the type of zipper that should be present on the pouch and medication kit.

If the Department decides, or is required, to have a vehicle mounted safe for secure storage of controlled substances, it should invest in electronic safes that are programmed with track-able identifier codes specific to each provider. These electronic safes should have the capability to report openings and identify who opened them. The controlled substance pouch in the safe should also be sealed and have a seal log for tracking.

Figure 1. Sealable Zippers The above picture is an example of the type of zippers that should be on the medication kit and controlled substance pouch. As can be seen when the zipper sliders are next to each other there is a double ring formed. This ring is where tamper resistant seals should be placed as it will eliminate a void space where vials could be removed or emptied via a syringe.

The Department may require a surplus of controlled substances in order to restock after use. Although ideally, each individual station housing an ambulance would have a limited amount of restocking supplies and pharmaceuticals, the Department should have a central supply station where the bulk of supplies and pharmaceuticals are kept. Rather than have multiple locations it is best that the Department maintain surplus controlled substances at a central supply station only. This will allow limited access to the main supply. The Shift Commander and alternates should have access and be responsible for providing items to restock the ambulances. The surplus controlled substances should be kept in a secure room and accounted for through a medication tracking management system.

There a variety of medication tracking systems available on the market. These systems can track supply, use, and notify when supply is low or close to expiring. Additionally these management systems provide secure lock boxes for controlled substance storage and can be set to monitor for tampering and miscounts. These types of tracking systems will help to ensure the security control of all pharmaceutical stock

Implementation

Once the Department has completed a needs assessment and identified risks and costs, it will need to create an implementation plan that involves the establishment of a timeline for integration. This should involve dates for hiring and the acquisition of equipment and supplies. It would be in the best interest of the Department to pay close attention to the planning phase and be as focused and detailed as possible. A successful integration will take a minimum of 15 months for the planning phase and another year for the acquisition and hiring of operations employees, at a minimum. Currently the ambulance manufacturing industry can deliver a single ambulance in three to nine months, depending on the manufacturers' size, capabilities, and work load. This timeline does not include the amount of time required to plan, assess vendors, initiate a bidding process, select a manufacturer, or proceed through the ordering process. Patient handling devices such as cots and patient care devices such as cardiac monitors also will require a wait period. For example, a single cot could take 4-6 weeks for delivery. For these reasons, the Department will need to consider the following issues regarding implementation.

Ambulances

Key West Fire Department should plan for a minimum of four ambulances, two new ambulances as front-line units, with two used ambulances as mechanical reserves.

The Department maintains three stations that are staffed on a 24 hour basis. In 2013, Care Ambulance responded to approximately 5,603 requests for EMS service, which led to 4,420 EMS transports. This volume of EMS requests can be handled by ambulances that are statically deployed, meaning that they will be assigned to a station unless dispatched to a location for service. Because of the call volume demands, the Department will minimally require two front-line ambulances and two mechanical reserve ambulances. Reserve ambulances should be maintained in a "turnkey" ready state. A turnkey ready state means that the reserve unit is kept fully stocked and equipped for immediate service.

The purchasing of ambulances and other essential equipment is a major component associated with EMS integration. The Department should consider the type or types of ambulances that it wishes to purchase. The State of Florida has a list of resources that are required on ambulances listed in §64J-1.002 and §64J-1.003 in the FAC. Additionally, the State requires that Ambulances be constructed to the Government Services Administration (GSA) KKK-A-1822 ambulance specification. However, this specification model will be expiring in the near future. As such it will be in the Department's best interest to familiarize itself with NFPA 1917: *Standard for Automotive Ambulance*. Both documents outline a number of required ambulance specifications, but do not dictate the specific chassis that agencies can purchase. The NFPA standard builds on many aspects of the KKK-A-1822 specification standard.

Currently, private transport ambulance services have begun to use the Sprinter van as their primary mode of patient transport. Although this is an extremely fuel efficient and cost efficient model, it may not meet the rigorous needs of a 9-1-1 service. The chassis are light-duty and lack the compartment space for housing fire service personal protection equipment and SCBAs. Additionally, the patient compartment may be restrictive to accommodate a larger patient or a large patient care team. The vehicle could be easily overloaded with the transport of a morbidly obese patient. The vehicles that would best suit the needs of the Department would be Type I, III or III-AD (Additional Duty) chassis ambulances.

A Type I chassis ambulance has a square modular ambulance body that is mounted onto a cab chassis with a 10,001 lb. to 14,000 lb. Gross Vehicle Weight Rating (GVWR). Although it can be a van or pick-up truck chassis, it is typically the latter of the two. A Type I-AD is an ambulance with a 14,001 lb. or more GVWR constructed on a cab chassis with a modular ambulance body. Department decision makers should keep in mind that the vehicle's GVWR limits how much weight can be safely carried by the chassis. Adding the weight of the patient compartment box, cabinets and equipment impacts this weight, meaning the amount of additional weight placed on the chassis reduces the ability to safely operate the ambulance.

A Type III ambulance is one with a 10,001 lb. to 14,000 lb. GVWR constructed on a cutaway van chassis with integrated modular ambulance body, while an III-AD is an ambulance with a 14,001 lb. or more GVWR on a cutaway van chassis with integrated modular body.[33]

Figure 2. Type I ambulance

[33] NFPA 1917 Standard for Automotive Ambulances 2013 Edition.

Figure 3. Type III ambulance

Figure 4. Type III-AD ambulance

The major difference between the Type I and Type II is that of the integrated versus non-integrated modular body. An integrated body is one that has an area that passes through into the cab from the patient compartment. A non-integrated body is one that either has a small window between the cab and the modular body or no access point at all. Both have a set of pros and cons that can be discussed with the manufacturer.

One of the benefits of using a Type I or III chassis is that they get better fuel mileage than the Additional Duty, and are suited for stations with low call volumes. Although starting and shutting off the ignition after short periods of times wears on any engine, with appropriate and timely maintenance, these units handle this practice well. Additional Duty trucks, on the other hand, do not handle frequent starting and shutting off of the ignition well. These vehicles are best suited to prolonged periods of engine activity, either idling or driving, and without long operation times some engine components may malfunction, leading to costly repairs.

Another consideration is how the unit handles the disposal of diesel particulate. Depending on the type of engine selected for the Additional Duty there may be a periodic requirement to allow

the engine to “Re-Gen.” In these instances the engine either needs to be driven at a recommended speed until a set engine temperature is reached to eliminate particulate or allowed to idle until Re-Gen is complete by setting the engine in a Re-Gen mode. The engine will notify operators when this is needed, and if ignored for too long, the engine will automatically shut down as a protective measure. Typically a driving Re-Gen takes less time than an idling Re-Gen.

Another advantage of the Additional Duty is its high GVWR. This type of vehicle can adequately handle morbidly obese patients and can be enhanced to do so by adding a patient lifting device. The Department should consider utilizing a standard automatic cot and/or lift arm that has the capability of supporting at least 600 lbs. This type of lifting system will also reduce the potential for back and knee injuries associated with repetitive motion and heavy loads. The major manufacturers of cots all offer an extension platform that can accommodate larger patients. The automatic cot and lift arm will perform the loading and protect the modesty of the patient.

In regards to the chassis of all the possible ambulance configurations, decision makers should pay special attention to the speed at which an ambulance sent to service for engine issues can be returned. An ambulance with a van chassis may require two to three times a greater amount of time to service than an ambulance on a pick-up truck chassis or a chassis with a “tilt-hood” (such as the International DuraStar seen in Figure 4). This is due to the manner in which the engine and its working parts can be accessed. For example, making repairs to the engine of a van chassis may require a mechanic to remove the radiator and disassemble other parts of the chassis. A pick-up truck chassis or chassis with a tilt-hood provides more advantageous access to the engine as a whole. As such, the latter of the two options have a faster turn-around time regarding engine repairs.

Purchasing Ambulances

Although it is a common practice for Departments to directly purchase apparatus and capital investment equipment, it does pose a significant monetary hardship when multiple pieces of apparatus and equipment are purchased at once. This large investment can be a significant deterrent for smaller agencies looking to expand service, but there are more plausible options than direct purchasing. Additionally, purchasing may be an option that is better suited for replacement of ambulances on an as-needed basis or for adding ambulances a few at a time.

Another consideration for expanding service is through fleet leasing. Leasing apparatus is a suitable option especially if the service is new and will require assembling a fleet of ambulances all at once. The lease option for apparatus is different from the traditional lease option for personal vehicles. In an ambulance lease, the lease is a municipal loan from a broker with a $1.00 ownership buyout option at the end of the lease. This way the Department can design and equip an ambulance with monitors, AEDs, cots, stair chairs and other patient care devices that are considered capital expenditures, and built into the design and price. The total cost of this will then be spread out over the length of the lease, which minimizes startup costs and allows for better budget planning of resources.

Lease options are available in three, five, and seven year plans and depending on the City's bond rating, interest rates are typically around 2-3%. With the three and five year options, the first payment is typically waived, but the seven year option normally requires a 10% down payment, which is then considered to be the first payment.

Projected cost will be discussed later in this proposal.

Integration

Once decision makers have identified the system and vehicle options that best suit the needs of the City, it will be necessary to establish an implementation timeline.

How implementation is performed will have pros and cons regardless of whether the Department has an immediate implementation plan or one that is phased in over years. One issue is the cost of implementation. Although an immediate implementation of EMS transport service does present a large cost up front, it can typically be offset with discounts from bulk purchasing, especially when buying ambulances, cots, stair chairs, monitors, and other capital expenditures. By spreading these costs out over time there may be significant increases in equipment costs each year that will cause unforeseen expenditure increases. Alternatively, spreading implementation out over time allows for apparatus to be purchased and replaced on a more dynamic timeline, ensuring that the entire fleet will not require replacement at once. Additionally, implementation over a period of time potentially allows for hiring to be spread out and gives the Department the opportunity to develop job experience throughout the Department rather than all providers having the same lower levels of experience at the onset. Phasing in the implementation allows for the Department to develop providers to later act as infield training liaisons via a mentoring and employee development program.

Because of the Department's current staffing, call volume and projected call volume, there is no need or reason to integrate EMS over time. The Department should acquire the required equipment and ambulances and after the planning, employing and purchasing phase, designate a day and time where service will transition from the current provider to the Department. This will avoid the creation of a contentious environment between the two agencies by providing a "clean cut" rather than phasing out existing resources.

The Department may seek to alleviate alienation of Care Ambulance providers by considering offering them employment. However, it is essential that the Department's administration and the City realize that single-role paramedics and EMTs do not qualify for the cost saving FLSA 7(k) exemption unless they are required to become firefighters and act as firefighters on the job. If the Department hires single-role paramedics they will be required by federal mandate to receive overtime compensation when they work in excess of 40 hours/week. This will cause a significant inflation to straight time personnel costs due to the additional personnel that would be required to manage the provision of EMS, as well as significant overtime costs if needed to work longer than a 40 hour work week. By hiring multi-role Firefighter/ Paramedics and EMTs, the Department would realize some savings by requiring fewer additional employees necessary to proceed with the EMS integration. Opening the hiring process to single-role paramedics and EMTs would expand the hiring pool, but employees should be required to immediately become NFPA Firefighter II certified as a condition of employment after they have been hired.

Integration is not an overnight process. There will be many issues and training topics that will need to be addressed as has been explained. However, given time and consideration, there is no reason the Department could not begin with a full integration immediately after all the components are in place. Again, this will require the department to have hired administrative positions, a billing company, and additional personnel and procured all the necessary equipment, supplies, and miscellaneous requirements for service. Successful integration, taking into consideration time to hire, train, and procure and construct the fleet could take 12 to 18 months for a seamless and successful integration.

Immediate Implementation

Due to the Department's size and the estimated call volume, implementation should be immediate; however, the title "immediate implementation" should not suggest that implementation can happen as soon as resources are received. Immediate implementation means that after a prolonged period of evaluation, planning, and acquiring, the service will begin on a designated time and day, replacing the current service. Metaphorically, it is equivalent to turning one light off and another on. To contrast, a "step implementation" would mean that after a prolonged planning period, replacement resources come into service and are increased steadily over an extended period of time while the existing provider reduces their resources until a deadline is reached. This would be more appropriate for a large department that, due to financial and mechanical concerns, would need to spread the purchasing of a large fleet out over many years.

Because the Department will be providing EMS transport service out of three stations and replacing one agency, an immediate implementation would be more appropriate than a step implementation. Furthermore, this will eliminate conflict that may occur between outgoing providers and the Department when summoned to provide care at the same location. This type of conflict will frequently result in poor on-scene patient care.

It will be essential for the Department to utilize several phases for implementation. As will be noted, these phases are listed without proposed dates. This is to allow decision makers a means to determine their own timeline structure while following these phases for implementation. This way the Department will be more familiar with the needs for hiring personnel and acquiring resources in accordance with existing standards and laws.

The phases of integration discussed here will reflect the best case scenario of integration in 15 months starting June 2, 2014, after the Commission has approved this plan, and concluding August 1, 2015. Due to the 15 month window, many of these phases must be conducted simultaneously. This proposal assumes calendar days when calculating timelines. This proposal also does not consider Commission recesses, which may also cause alterations to the timeline.

Phase I-Planning and Hiring Essential Management

Phase I will commence June 2, 2014 after the Commission has approved integration. The Department will require a Division Chief of EMS and a physician to act as the Medical Director. It is assumed that the Department will require two weeks for the City Commission to approve a promotional process for a Division Chief and six to nine months to complete the process and appoint a Division Chief. For a Medical Director, the Department will need 90 days to create, open, and approve the Requests for Proposals (RFP) for a physician. Because of this, the Chief of the Department, or his designee, will be required to direct the process of integration until these essential positions are filled.

At the Start of Phase I, the Department will begin the process of assuming 9-1-1 EMS transport, currently delivered by Care Ambulance. Decision makers should begin by identifying all employees who possess a Paramedic certification or license so as to calculate how many Paramedics will be needed to provide a fully integrated ALS service with ALS first response. It would be also be beneficial to identify any employee who wishes to increase their EMS provider level to Paramedic, keeping in mind the amount of time required to gain initial certification. With these assessments in mind, decision makers can then have a reasonable idea how many currently certified Paramedics they will have to hire to meet the proposed ALS service level. Depending on how decision makers and the Medical Director desire to arrange the service, an all ALS service will require, at a minimum, one Paramedic on all fire apparatus and front-line ambulances.

As stated the Department should promote a Division Chief of EMS for the Department who can handle the administrative aspects of an EMS agency. When the Department has employed a Division Chief of EMS and contracted with a Medical Director, the two should begin the process of creating the EMS service. Working in concert, the two should begin to identify the needs of the population based on an assessment of historical call volumes and demographics. Once the needs have been identified it will be essential to determine the resources, supplies, and equipment required to meet these needs. However, due to limitations regarding promotions and third party contracts it will be impossible for both of these positions to be appointed at the same time. A physician to act as a Medical Director could be contracted within as early as 90 days following approval, and a Division Chief of EMS as early as six months, but as late as nine. As such, the Department will have to move through these phases under the direct supervision of the Chief of the Department, an interim Division Chief of EMS, or a designee of the Chief. However, these limits will interfere with the application process in regards to applying to be an ALS service. It would be in the Department's best interest to perform as much of the work as possible so when the positions are filled they can easily transition into work with minimal assistance. The Chief should plan to seek council approval for a promotional process for Division Chief of EMS and a contract for a physician at the Commission meeting on July 1, 2014.

Given the best case scenario of implementation in 15 months, it will be essential for the Chief of the Department, or his designee, to begin the process of applying for a COPCN with Monroe County. The Chief of the Department should also form managerial committees, consisting of supervisors and line personnel, to begin working on the numerous requirements for EMS integration.

Phase II- Managerial Committees

The Chief of the Department should identify issues that require a committee and post an announcement for interested employees to participate. The Chief of the Department will be the Chair of every committee, but should have an officer co-chair on each committee to report to him. It should take no longer than two weeks for the Chief to post and form committees. In order to incentivize participation, employees should be appropriately compensated for their time. The announcement for managerial committees should begin on Monday June 2, 2014 and close Monday June 16, 2014. Work groups should be assigned and notified by Friday June 20, 2104, with work beginning Monday June 23, 2014.

With a needs assessment completed, committees should be formed to address and create the foundations of the new EMS system. Committee activities include, but are not limited to, finding an EMS billing company and ePCR, preparing Standard Operating Procedures, developing specifications for the ambulance fleet and equipment, writing EMS protocols (if none exist), and other considerations necessary for successful implementation. This phase could be enhanced if current non-supervisor operational Department personnel are allowed to participate in the committees.

Allowing non-supervisor operational employees to participate in the committees will provide a number of benefits to the creation of the EMS service. Primarily, inclusion will increase the likelihood of veteran and junior employee acceptance by promoting a sense of pride in ownership. The support of existing personnel in the transition from a first responder to a transport capable service will be one of the keys to successful integration, as these employees may occasionally be required to serve a rotation on the ambulance. As such, some of the committees that would benefit most from current employees' participation would be, but not limited to, committees on ambulance specifications and manufacturer selection, equipment and supply selection, and protocol development. The Department benefits the most by utilizing these all-inclusive committees because they all affect the end-user, namely the EMS provider, and their ability to perform the job-specific tasks required in the provision of care.

As with other aspects of this proposal, participation should be voluntary and non-punitive, with employees being appropriately compensated for their time worked. Furthermore, decision makers should provide an appropriate amount of time for committees to not only meet, but to achieve their assigned objectives. For example, the average production time for a fleet of

ambulances ranges from three to nine months, depending on work load, availability of chassis, and standard design versus a customized design. This does not include the time needed to design the ambulance, select a manufacturer, or conduct a bidding process if one is required. Additionally, equipment the Department wishes to use in the ambulances needs to be selected, purchased, sometimes manufactured, and shipped to the ambulance manufacturer before assembly begins. As such, it may be prudent for decision makers to allow this committee a year or more to perform the task. Another example would include the creation of the EMS protocols beyond the scope of first response. If the Department wishes to create an entirely new set of protocols it may take at least one year with monthly meetings to accomplish the task. However, there are many prehospital protocols available that could simply be adopted.

Phase III-Purchasing the Fleet

Much of the work to purchase the fleet will be completed by the managerial committees. Entering Phase III indicates that the specifications for equipment and ambulances have been completed and the Department is ready to proceed into the RFP process. If the committees work diligently to accomplish this, the specifications for ambulances could be completed in two months with the Chief of the Department seeking council approval for the fleet purchase, using best-value bid selection, on August 20, 2014. Specifications should include all the capital equipment that will be required on the ambulance.

In this phase the Department should have prepared its desired specifications and needs assessment for ambulances, equipment, and supplies and opened the bidding process as directed by local law or rule. The bid process should be open for as long as Key West requires it to be. Once the bids have been successfully awarded to the manufacturers and vendors, the Department should expect to receive the completed fleet within three to nine months of placing the order, dependent upon on the manufacturer and availability of ambulance chassis. If the Commission approves the fleet by August 20, 2014, the Department could expect a manufacturer to be approved by December 2, 2014. Following meetings with the selected ambulance and equipment manufacturers, the Department could expect to place the final orders by month's end, with manufacturing starting January of 2015.

In order to increase the likelihood of receiving a reliably manufactured fleet with a good warranty package, the Department should make an exception to the bidding process. If not currently a practice, decision makers should allow for accepting a "best value bid" over the "lowest bid." By allowing the Department to purchase based on best value, vendors are de-incentivized to cut corners and offer little technical support. Instead it encourages vendors to offer better value through quality features and better technical support, as they know that there is the potential they will not be selected solely on the lowest dollar value.

Additionally, the State of Florida has a cooperative fleet bid purchasing program through a

partnership with the Florida Sheriff's Association and Florida Association of Counties. A contract extension has been granted through to December 31, 2014 and more information can be found using the following link,

http://www.flsheriffs.org/our_program/purchasing_programs/cooperative-fleet-bid-awards/.

This could present savings to the City and Department in the purchasing of a new fleet.

Phase IV-Hiring Essential Personnel

Given the Department's work schedule and average vacation and sick leave usage, the Department has a staffing factor of 4.03. The staffing factor is the number of personnel that would need to be hired to fill one position on a piece of apparatus 24 hours per day, 365 days per year. With two daily ambulances in service each staffed with a crew of two personnel the Department will need to hire 16 additional Full-Time Equivalents (FTEs). These additional FTEs per day do not include the addition of a Division Chief of EMS or a Medical Director.

In order to maintain a minimum of one firefighter/paramedic on each engine and ambulance, using the 4.03 staffing factor, the Department would need a minimum of 20 firefighter/ paramedics. The Department has 13 firefighter/ paramedics currently employed and an established hiring list with 14 applicants, 5 of which are paramedics. By hiring the five firefighter/ paramedics, and assuming one of the current employees will be promoted to Division Chief of EMS, the Department will need to hire three more firefighter/ paramedics. The Department will then need to employ eight more firefighters, ideally with paramedic certification.

The current Department ALS provider pool is suitable for providing an acceptable base-of-experience and institutional knowledge to provide quality guidance to newly certified and less experienced providers. However, with such a significant expansion of employees, there is the potential to hire a large pool of inexperienced providers. Although experience will be gained over time, it would not be in the best interest of the Department or current personnel to have a large pool of employees all at the same lower experience levels. This could lead to the potential for critical errors if unchecked by more seasoned providers. As such, the Department should make the effort to employ currently certified and experienced Paramedics.

By employing previously trained Paramedics with field experience, the Department will potentially have a stable provider platform on which to build a successful operation. The Department should consider hiring employees so that every ambulance has at least one Paramedic and every engine has two Paramedics. In doing so, the Department will be able to address most requests for EMS service without reducing depth of coverage. Furthermore,

having two paramedics on the engine will allow for an available second paramedic to transition to the ambulance for critical runs requiring additional ALS personnel while allowing the engine to maintain ALS first response capabilities. Additionally, by having a mixture of ALS and BLS providers, the Department can maintain a flexible rotation for ambulance service and reduce the incidence of care-giver stress which can be high among prehospital care providers.

In order to attract experienced paramedics the Department will need to do more than simply award additional testing points. It is a standard practice that pay scales are developed based on time of service with an organization, and that leaving one agency for another means taking a pay decrease to start at the bottom of a pay scale. Experienced and successful candidates are likely already employed full-time by other agencies and would be de-incentivized to consider changing employment when a pay cut would be involved. As such, the Department should strongly consider instituting a lateral-entry pay scale. A lateral-entry pay scale would allow a new and experienced employee to transition from another department at a pay step comparable or equal to the pay step they are leaving. Although the Department may not be able to match the exact pay step, by minimizing the potential for a large pay decrease, it may be able to attract a larger applicant pool of experienced candidates.

Phase V-In Service

With a January 2015 manufacturing start date for the ambulance fleet, there is the potential that ambulances could arrive June 30, 2015. When the ambulances arrive, the vehicle information required by the State of Florida must be added to the ambulance service license application and the application must be submitted. Approval can be expected in as little as two weeks to 30 days. By Phase V the Department should have the minimum personnel, ambulances, equipment, supplies and authorizations required for the implementation of transport services. On August 1, 2105 the Department will assume responsibility of 9-1-1 patient transport in the service area and Care Ambulance service will stop. Ideally the time for transition of service should occur at the start of the Department's day tour rather than at midnight so that any issues that develop can be addressed while providers are well supported by administration and staff.

Also in this phase the Department should have all the required information to complete the application to submit for Medicare reimbursement.

Considering a Future 9-1-1 Ambulance

A third frontline ambulance is a strong possibility. However, it will require future data collection and planning. An additional frontline ambulance should be considered post-implementation to allow the Department and City the appropriate amount of time to assess its need.

Care Ambulance currently provides two ambulances (Med-1 and Med-2) staffed with two prehospital care providers and one ambulance staffed with a lone supervisor (Med-3). If Med-1 and Med-2 are assigned to incidents and a third incident is received, Med-3 and a fire apparatus respond to the request for EMS service. If the patient requires transport to the hospital, a member from the fire apparatus must transfer to the ambulance. Additional requests rely on a mixture of ambulances assigned as interfacility transport units from Care Ambulance and/or ambulances from other jurisdictions, typically Monroe County.

Available data for the frequency of these occurrences was limited. For tracking simultaneous incidents, Care Ambulance divided a day into hour slots from midnight to 11:00 PM. The number of simultaneous incidents over the course of a month in a given time slot was then recorded. However, this data does not account for specific time of dispatch or day of the week. Although the additional data needed would not be difficult to determine, the amount of data available during the development of this proposal made it impossible to justify a third staffed ambulance with confidence.

Once service is implemented with two frontline ambulances, ALS first response, and established billing rates, the Department should begin a study to ascertain the need for a third frontline ambulance. This study should precisely document the frequency of simultaneous incidents, when and where they occur, the level of prehospital care required, and how long it took a mutual aid ambulance to respond. Using this data the Department will be able to determine a number of deciding factors to support the addition of a third ambulance, the principle factor being how long a patient in need of transport to the hospital must wait for the arrival of an ambulance. If the risk versus benefit supports the addition of a third ambulance, then the City and Department should make the investment to add apparatus, equipment, and eight additional personnel. The second factor is that the Department will be able to determine how much potential revenue is being lost to mutual aid agencies. If the amount of revenue lost is enough to offset the cost of service provision, then the City and Department should invest in the additional resources.

It is not the recommendation of this proposal to provide mutual aid ambulances, whether they are private- or government-based, a subsidy per transport. Collecting revenue for transport should be the responsibility of the agency providing the transport, not the Department's or City's. By providing mutual aid ambulance agencies with a subsidy per transport, the City and the Department risk losing monies if they are unable to collect the same amount from insurance companies or Medicare for the transport.

Cost

Ambulance costs will be impacted by the number of ambulances purchased, the type of chassis selected and the number of customizable items added. Typically, ambulance manufacturers will install all patient transport related items, but it may be the responsibility of the purchaser to order and have the equipment delivered to the manufacturer for installation. Similarly the manufacturer may install the radio antennas and electrical wiring to support a communications system, but will not actually install the radio or a Mobile Digital Communicator (MDC). These items must be arranged during the meetings with the ambulance manufacturers. The Department should plan on spending approximately $180,000 per Type I or III chassis, and Additional Duty ambulances will cost approximately $250,000. This pricing would include the chassis, mounting and manufacturing of the modular ambulance patient treatment compartment, and vehicle striping. Purchase costs for vehicles could potentially be offset using the cooperative fleet bidding process and grants.

It has been stated by executive membership of IAFF Local 1424 that all transports by the Department will be to a local hospital. Given this information, this proposal will focus attention towards purchasing Type I chassis. As previously discussed, this is because the short travel and idle times prevent Additional-Duty chassis ambulances from generating enough heat to function efficiently. Additionally, the van-chassis of Type III ambulances require more time for engine repairs due to their construction and position of the engine.

The estimated cost of supplies to stock one ambulance for BLS service is approximately $19,338 and the cost for ALS is $65,172.58. These estimates include costs of items that may not be needed or required according to protocol or by the service, and removing these items will reduce the proposed cost. The details for the items in this proposal are included in Appendix B and C respectively. Items on the list were compiled based on the Equipment for Ambulances list produced by the joint efforts of the American College of Surgeons, American College of Emergency Physicians, National Association of EMS Physicians, Pediatric Equipment Guidelines Committee, and the American Academy of Pediatrics. The prices also only reflect the minimum compliment of equipment that must be purchased in order to stock one ambulance and equip each with patient monitoring devices such as cardiac monitors, pulse oximeters, etc. Some item prices represent the cost of “per item” and “per box.” This is due to the packaging and distribution of specific items and not the quantity that an ambulance is required to have, although the cost charts in Appendix B and C include some recommendations for quantities required. Additionally, these price lists do not include the cost of supplies that must be purchased to maintain reserve supplies to restock ambulances after patient encounters. It is also important to note that although supplies may not qualify for grants, AEDs and a few other patient monitoring devices typically do. This can further offset costs. Savings may also be realized by contacting and negotiating with the supply distributers who may be willing to adjust prices.

There are a few costs that were ascertained using data submitted by Care Ambulance to TriData for their proposal. These include the cost of oxygen for both portable and main oxygen cylinders: $3,600, and disposable medical supplies: $27,693.00[34].

The Department may not require additional costs for housing additional personnel or storage for equipment and supplies. Existing stations have enough space to accommodate the increase in personnel, apparatus, and storage. Additionally, monies have already been allocated for the construction of a new station which can be designed to increase storage and housing capacity as needed.

The State of Florida also requires that ALS services provide insurance verification. A government service must carry a minimum limit of $200,000.00 total for bodily injury and property damage coverage. Medical malpractice coverage does not appear to be required unless the Department intends on providing air-medical transport[35]. However, the Department and the City should consult with the State of Florida Department of Health.

[34] Determining the Future of EMS in Key West, March 7, 2014, TriData.
[35] §64J-1.002 F.A.C.

Cost of Personnel

As previously stated, the Department will be required to hire a minimum of 16 additional personnel in order to provide an EMS transport service. This number does not include the Medical Director or the Division Chief of EMS positions. Table 4 reflects the costs of additional full-time personnel, which will see a potential decrease in following years depending on the frequency of the purchase of Personal Protective Equipment.

Estimated Cost of Full-Time Personnel

Description	Cost
Personal Protective Equipment	$3,050.00
Uniforms	$1,020.00
First Year Salary, Benefits & Pension	$73,053.00
Total Cost for a Single Firefighter	$77,123.00
16 Firefighters	$1,233,968.00

Table 4. Estimated Cost of Full-Time Personnel. The above table highlights the estimated cost of hiring 16 full-time employees with NFPA Firefighter II and Paramedic certification in 2014. Cost of Personal Protective Equipment was calculated as follows, Bunker Gear: $1,800.00, Combat Fire Boots: $400, SCBA Mask: $600.00, Fire Helmet: $250.00. This excludes the cost of a Division Chief of EMS and a Medical Director.

The original TriData proposal for EMS integration included a salary for the Department's Medical Director of $20,000.00 for 15 hours per week, or 780 hours per year. This is a low estimate for the hours of work proposed. If the Department uses a minimum 10% true Medical Direction CQI review of all EMS incidents, it would account for 540 incident reviews per year. Estimating a minimum of 20 minutes per review would be 180 hours of work, it is assumed that the remainder of the hours (600 hours) will be spent providing training or participating in field observation with the ambulance crews.

An emergency department physician could, on an average, work twelve, 12-hour shifts per month, which equals a 36-hour work week. With the additional 15-hours per week proposed by TriData, the Medical Director would then have a 51-hour work week. This would equate to a 0.3 FTE in costs. In 2011, a southeastern United States emergency department physician averaged an annual income of $273,000.00[36], which equates to a salary of $81,900.00 for a 0.3 FTE. On the

[36] Emergency Physician Compensation Report: 2013, http://www.medscape.com/features/slideshow/compensation/2013/emergencymedicine

lower end of service, emergency department physicians average between $100 and $400 per hour treating patients. This would equate to a salary of $78,000.00 given the time proposed.

If the Department wishes to approve no higher than $20,000 per year for Medical Direction, using the minimum of $100 per hour, the physician would be required to work 3.8 hours per week. It is possible that the Department could partner with other departments to share a Medical Director. Additionally, there is the possibility that the Department may find a physician who will work for the proposed amount.

To adequately assess the hourly requirements of medical direction, the Department should compile two itemized lists of needs and wants. These lists should be all-inclusive and as concrete as possible and include administrative meetings such as strategic planning, phone availability, CQI, field observation, scene response, education, protocol development, regulatory time such as DEA licensure, program and initiative development, hospital/ Department relations, and infectious exposure issues, to name a few. Once these lists have been compiled, the Department will have a more realistic assessment of how many hours of the Medical Director's time will be required.

For this proposal it was assumed that the Department would require a Medical Director for only half of the time that was proposed by TriData. This would provide a physician for 7.5 hours per week, or 0.17 FTE, which equates to a contracted salary of $46,410.00 per year.

In addition to the Medical Director, the Department will require approximately $130,000.00 for a Division Chief of EMS. This total includes benefits and pension. Table 5 demonstrates the total cost of personnel.

Total Cost of Personnel

Description	Quantity	Cost
16	Firefighter/ Paramedics	$1,233,968.00
1	Division Chief of EMS	$130,000.00
1	Medical Director	$46,410.00
Total Cost		$1,410,378.00

Table 5. Total Cost of Personnel: The above table displays the total cost of personnel in year one of operations.

Dispatch

In the TriData proposal, it was recommended that the City invest in increasing its dispatch capabilities to include priority dispatching. Priority dispatching is a protocol driven system that provides dispatchers the ability to appropriately prioritize calls. Specifically, the system provides 9-1-1 call takers with a scripted series of questions that changes based on answers provided by the caller. This allows the dispatcher to select the appropriate resources and provide appropriate pre-arrival instructions to assist the caller with their immediate emergency.

Providing dispatchers with a standard protocol and script based on the primary request for service also prompts dispatchers to gather as much information about the emergency environment as well. This reduces the likelihood of failing to collect information that may lead to better tactical decisions as well as enhance the safety of responders and bystanders. With the script, protocols, and decision-making algorithms, dispatchers are able to assign response codes to incidents which dictate how emergency vehicles respond to requests for service. For example a person having a heart attack would receive a high priority code which would necessitate a full emergency response with lights and sirens. However, a finger laceration would necessitate a non-emergency response without lights and sirens and a strict adherence to local road speeds and traffic control devices.

There are three major producers of priority dispatch software; the most notable is Priority Dispatch. The company offers three individual platforms for EMS, fire, and police. In order to transition to this software platform the City will have to assess the existing hardware for compatibility. If incompatible this may lead to an increased cost. As the City is currently only assessing EMS, the costs in this proposal will be isolated to the EMS platform.

Currently, dispatch for 9-1-1 EMS transport is provided by the City of Key West police department. The dispatch center maintains three terminals, one back-up terminal, 10 full time dispatchers, and 3 back-up dispatchers. Dispatch of incidents is broadcast using common language format. All units respond using an emergency lights and sirens response, unless dictated by SOPs.

To upgrade to a priority dispatch system the City and Department would minimally need to purchase software for all the dispatch stations, potentially purchase a client/server software, purchase the second language option to meet the needs of the population, quality improvement/case review software, the medical module, dispatch cards in first and second language, and provide training for all dispatchers and software maintenance. This could potentially add another $135,000.00 or more to start-up cost[37]. This cost also assumes that the

[37] Approximate cost was determined using public domain, Priority Dispatch quotes found on-line on a number of municipal and county government agencies web-sites.

terminals being used by the Key West dispatch center are compatible with the software, if not additional costs could occur.

Because of these additional costs, it is not the recommendation of this proposal to expand the dispatch center's capabilities at this time. However, in the future, the City would benefit from increasing its dispatch capabilities to priority dispatch for not only EMS response, but police and fire as well.

Acquiring Ambulances

Although it may be attractive to purchase a used ambulance, the Department should consider the life expectancy of a used ambulance and the subsequent maintenance issues that may result from age and previous service history. Similarly a used, refurbished, or manufacturer demonstration model ambulance may have a limited warranty which may lead to increased maintenance costs. Used ambulances may not have a warranty at all. On the other hand, these types of ambulances can be purchased quickly since they are already manufactured, allowing for service to start sooner. Additionally, purchasing a mixture of used and new ambulances allows for the Department to create an ambulance replacement schedule to avoid having to replace the entire fleet at once. It is a recommendation of this proposal to purchase two new ambulances and two used ambulances to initiate service.

It is recommended that the Department purchase or lease ambulances for service.

Based on estimated call volumes the Department should acquire a minimum of four ambulances, two to act as the primary ambulances and two to act as mechanical reserves. This will allow the Department to deploy a primary and a secondary ambulance to meet the demands of overlapping requests for EMS service. Additionally, all mechanical reserve ambulances should be maintained in a "turnkey" ready state. A turnkey ready state means the units are fully stocked and equipped and can be deployed immediately if the need should arise. Although this may mean that the department will have to increase its capital resources, the investment will pay off in maximizing preparedness and response capabilities.

The startup costs for ambulances shown in Table 6 are only representative of the cost to purchase and outfit one ambulance. This does not include the cost of supplies required in reserve to restock. Annual operating costs have been provided by Care Ambulance and will be discussed later. To ensure cost effectiveness the Division Chief of EMS should constantly evaluate historical usage data to make accurate predictions of how much stock should be ordered to maintain service. During the first few years this may require monthly reviews until the Department's EMS transport capabilities have been well established.

It is important to understand the cost of supplying and stocking an ambulance to determine how much will be needed to initiate an EMS transport service. Table 6 shows the estimated start-up

cost of the ambulance fleet of two new ambulances and two used ambulances with supplies and equipment, both perishable and capital. If the Department wishes to purchase the apparatus, equipment, and supplies as a bulk purchase there may be a reduction in cost from a bulk purchase discount. This bulk purchase discount is a matter between the manufacturer and the purchaser and should be clarified during the negotiation process.

Estimated Startup Cost per Ambulance

Item	Cost
Type I or III Ambulance (New)	$180,000.00[38]
Ferno 35X PROFlexX cot	$5,283.00
Stat Track Cot Fastener	$1,744.00
Ferno EZ-glide Stair Chair	$2,963.00
ALS Equipment and Supplies	$65,172.58
New ALS Total	**$255,162.58**
2 New Ambulances	**$510,325.16**
Type III Ambulance (Used)	$30,000.00
Paint and Re-stripe	$15,000.00
Ferno 35X PROFlexX cot	$5,283.00
Stat Track Cot Fastener	$1,744.00
Ferno EZ-glide Stair Chair	$2,963.00
ALS Equipment and Supplies	$65,172.58
Used ALS Total	$120,162.58
2 Used Ambulances	**$240,325.16**
Ambulance Fleet	**$750,650.32**

Table 6. Estimated Startup. The above table details the estimated total cost per ambulance based on the type and capabilities. These price estimates have some flexibility depending on the vendor, manufacturer, size of bulk purchase, and available grant monies. Furthermore these prices include items that the Department should not include as build-ins on the true purchase price; rather it reflects the total cost to stock and purchase a fleet. The line titled, "ALS Equipment and Supplies," is the estimated cost of perishable and re-usable supplies as well as some capital purchases such as a heart monitor.

The Department also has the option to lease the ambulances, thereby spreading the cost of the ambulances out over a period of time. When ambulances are acquired in this manner, the equipment that is, or would be considered, a capital purchase can be rolled into the cost of the ambulance. Perishable supplies are generally not purchased in this manner, as the Department would then be paying interest on disposable goods. Table 7 shows the estimated cost of starting service with five ambulances on a lease program. Because it would not be cost effective to stock an ambulance with perishable supplies using lease monies, the cost of these supplies was not included in Table 7. This is why there is a noted difference between the ALS total of Table 6 and Table 7.

[38] It is possible to purchase or lease this type of ambulance using the Florida Sheriff's Association and Florida Association of Counties State bid schedule, which has lower negotiated prices.

Estimated Startup Costs with Lease Agreement

Quantity	Item	Base Cost	Total Cost
2	New Type I or III Ambulance	$180,000.00	$360,000.00
2	Used Medium Duty Ambulance	$30,000.00	$60,000.00
2	Stripping and Painting for Used Ambulance	$15,000.00	$30,000.00
4	35X PROFlexX Cot	$5,283.00	$21,132.00
4	Stat Track Cot Bracket	$1,744.00	$6,976.00
4	EZ-Glide Stair Chair	$3,298.00	$13,192.00
4	Portable Suction Unit	$1,154.00	$4,616.00
4	2 Backboards	$505.76	$2023.04
4	Reeves Stretcher	$304.95	$1,219.80
4	KED	$217.90	$871.60
4	Scoop Stretcher	$828.50	$3,314.00
4	Vacuum and Traction Splints	$1,203.95	$4,851.80
4	Cardiac Monitors LP15	$39,788.00	$159,152.00
4	**Ambulance Fleet**		**$667,348.24**

Lease Option	Interest	Amount per Year	Total Repayment
3 years	3%	$243,076.48	$729,229.44
5 years	3%	$154,727.90	$773,639.51
7 years	3%	$117,250.59	$820,754.16

Table 7. Estimated Startup with Lease. The above table details the estimated annual cost to lease an ambulance fleet. The Department would require a Capital lease which ends with a nominal fee of $1.00 to complete the purchase. Purchasing ambulances in this manner allows for the total operational cost to be spread out over a number of years eliminating the need to have a large sum of money available with the first year of service. This estimated startup cost accounts only for the ambulance and other non-disposable items, most of which would be considered capital purchases. It also allows the Department to receive an ambulance that is, with the exception of perishable supplies, ready for service. This explains the cost difference of ALS totals between Table 6 and Table 7. Additional capital or reusable purchases such as equipment bags, flashlights, extrication equipment and other equipment with a variety of choice and cost options were excluded from this estimate.

Lease option costs in Table 7 were calculated using an equation for determining the amount of money owed after a determined amount of time at a fixed rate.

$$A(t) = A_0\left(1 + \frac{R}{n}\right)^{nt}$$

Using the principal amount borrowed (A_0), which is the cost of the ambulance fleet from Table 7, the annual percentage rate (R), or 3% expressed as a decimal, the number of compounding

periods (n) which is 1 (as the payment is annual), the number of years (t) which is 3, 5, or 7, it is then possible to calculate A(t) which is the total amount owed after (t) years. It should be noted that these values are estimates and are subject to change based on the City's bond ratings and if a down payment was applied towards the loan. All estimates were calculated assuming the Department had not made a payment. True cost may depend on a number of factors that the leasing agency and Department will discuss at the time of lease.

The Department should be aware that there will be additional costs associated with operations beyond initial purchasing of supplies and equipment. These additional costs will come by way of fees charged to provide service and maintenance on equipment. A service contract that is valid and renewable can be purchased with patient monitoring devices, but in the case of grant monies, must be purchased separately as grants do not frequently provide for additional warranties and service contracts. This service contract covers service to meet manufacturer's recommendations and repairs, with no unexpected costs. Patient handling devices such as stair chairs and anchoring/ bracket devices can be serviced annually and patient cots bi-annually. This is a service that is provided exclusively by a company named EMSAR. Prices for service vary depending on the type of equipment receiving service, and fees for labor and parts when warranted. It is essential that the department invest in these service agreements to reduce liability when handling patients.

The Department will also be required to increase its fuel budget with the addition of several transport units. Since it is difficult to project the total number of miles traveled and fuel consumed per trip, an equation was created to estimate the amount of distance traveled and associated fuel costs necessary to support operations. Using EMS responses from 2013, the Department responded to 5,388 requests for EMS service. It is important to note that in order to avoid an under-estimate in fuel cost projection, it was assumed that all requests for service would result in a transport. As such there will be some savings in fuel cost.

This value was then multiplied by the estimated travel distance per call, which was assumed to be the average distance traveled from a fire station to the hospital. The average distance with the fastest and most direct travel route was used, 4.0 miles. This value was then multiplied by 2, to represent the roundtrip distance from station and back. The product was then divided by 8, which is the average miles to the gallon rate for an ambulance. The quotient was then multiplied by the number of responses and the current cost of a gallon of retail diesel fuel per the U.S. Energy Information Administration (EIA). This was in turn multiplied by a factor of 1.30 to represent a 30% increase for additional travel unrelated to emergency response and idling time. This provides the following equation,

$$Cost\ of\ Fuel = Responses \times \left[\frac{Avg\ Miles\ to\ Hospital\ X\ 2}{8\ Miles/Gallon}\right] \times Cost\ of\ \frac{Diesel}{Gallon} \times 1.3$$

It should be noted that if the Department decides to purchase a gasoline engine chassis, fuel costs may decrease since diesel is a more expensive fuel choice at current market value. However, gasoline chassis tend to use more fuel when idling. Table 8 shows the projected cost of fuel.

Costs were projected using the anecdotal evidence to show the potential costs of fuel used in service provision. Using historical data from the EIA it was observed that the cost of diesel fuel has had little fluctuation in the last few years. It should be noted that the cost of diesel per gallon is the retail price for fuel. If the Department or City purchases their own fuel there may be additional savings in the cost for a government rate. Other issues that may impact the cost of diesel are unpredictable surges and declines in the fuel market from issues involving a wide spectrum of cultural, natural and/or economic events. These impacts may have positive or negative effects on the cost of fuel and cannot be adequately addressed or predicted in this report.

Estimated Fuel Costs

	EMS Call Volume	Average Distance to Hospital	Trips	Diesel/ Gallon[39]	Additional Travel Factor	Cost per Year
CY 2013	5,380	4	2	$3.85	30%	$26,926.90

Table 8. Estimated Fuel Cost. The above table details the estimated annual cost of diesel fuel that will be required to maintain the ambulance service. The additional travel factor represents a minimal increase of ambulance operational time that corresponds to additional operational use such as travel to maintenance, training, inspections, idling, or any other necessary Department use. This estimate is also calculated assuming that ambulances are statically deployed and are not idling in posted locations waiting for dispatch, as would be the case with a dynamic deployment model. Additionally, if the Department purchases ambulances with gasoline engines, there may be a reduction in fuel costs.

Estimated Annual Operation Cost

Description	Cost
Firefighter/ Paramedics	$1,270,987.04
Division Chief of EMS	$133,900.00
Medical Director	$47,802.30
Uniform Replacement	$1,200.00
Oxygen	$3,600.00
Disposable Medical Supplies	$27,693.00
Fuel	$26,926.90
Total Annual Cost	**$1,512,109.24**

Table 9. Estimated Annual Operation Cost, Year 2. The above table details the estimated annual cost of operations for year 2 that will be required to maintain the ambulance service provided by the Department. This cost excludes $73,200.00 in Personnel Protective gear that will only warrant replacement on an as needed basis. This cost includes a contractual 3% pay increase.

[39] http://www.eia.gov/petroleum/gasdiesel/

Additional Supply Costs

The Department and IAFF Local 1424 also requested the cost of increasing from a BLS first response to an ALS first response. It is assumed that the engine companies already carry a fully stocked BLS response bag and an Automated External Defibrillator (AED). As such, these apparatus will each require the addition of a stocked medication kit and a cardiac monitor. The addition of these items, plus associated supplies such as medications, defibrillator pads, cardiac electrodes, etc., will cost an additional $41,363.44 per engine company for a total of $124,090.32.

This cost could be offset by trading-in the existing AEDs to the vendor selling the cardiac monitors to the Department. Additionally, this proposal does not include the cost of increasing the ladder company to an ALS capable response vehicle due to its low staffing.

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Funding & Revenue

Typically, private for- and not-for-profit agencies require the municipality that they serve, as the primary provider of emergency transport, to pay an annual subsidy to ensure continued service. Additionally, these private companies will also aggressively bill patients in order to maximize profits. Even with hard billing they often require a continued subsidy to maintain service. This subsidy is usually minimal during the first few years of service and then, as contracts for service are renewed, private providers will increase their subsidy requirements once they are established as the exclusive provider of EMS service.

In addition, private companies will maximize profitability by deploying the minimum number of resources necessary to support the community or meet contract requirements. This minimum number of resources means that a private company will often have longer response times than the fire apparatus in a community. Frequently, in an effort to minimize costs, these companies adopt a response time that is over the 8 minute standard for response to an ALS incident. They do this by requiring initial assistance from fire apparatus that would arrive in less than 8 minutes, as a means of stopping the response time clock. This requires fire departments to staff and stock fire apparatus with EMS personnel and equipment necessary to provide an adequate skill level required to effectively stop the response time clock. Private ambulance companies also rely on fire department personnel to supplement their crews in the event that a critical patient has care requirements that demand additional personnel, either as extra providers or as a driver for the ambulance. There is typically no reimbursement for fire department services provided, which contributes to increased fire department operational costs while reducing the transporting agency's costs.

It is important for the Department and Local 1424 to realize that the Department will increase its spending with the addition of the EMS transport service. However, there are several areas where the Department could reduce cost by securing revenue from other sources.

Funding

During implementation planning and preparation it will be essential to gather funding from grants to reduce the financial impact on the Department. The Department should search for grants through private as well as public sources to offset these costs. Currently the State of Florida has a number of grants available through the Department of Health. These grants can be found online at the following address, http://www.floridahealth.gov/provider-and-partner-resources/ems-grants/index.html. The Department can plan to apply during the planning and development phases of integration. Additionally manufacturers of some of the medical and patient transport devices have grant specialists that can assist the Department in finding and applying for grants.

The federal government has three specific grants that may provide additional resources- the Assistance to Firefighters Grant (AFG) through the Department of Homeland Security, the Community Development Block Grant (CDBG) through the US Department of Housing and Urban Development, and the SAFER Grant. The CDBG grant has an open filing period, while the AFG has a set deadline every year. Departments filing for an AFG have had more success with purchasing equipment such as cots and monitors than with ambulances due to annually changing criteria within the grant process. There have been successful ambulance purchases through this grant. More information can be found by visiting the following websites for specific grant details.

- AFG: http://fema.gov/firegrants/
- CDBG: http://www.hud.gov/offices/cpd/communitydevelopment/programs/
- SAFER: http://fema.gov/firegrants/

Because Key West is located in a rural zip code it may also qualify for USDA Rural Public Safety Agency Grant and Loan Program, which has an open deadline.

- USDA: http://www.rurdev.usda.gov/HCF_CF.html

Another source of funding is through private and corporate philanthropy grants. These grant sources, similar to government grants, focus on a target industry that they are interested in financially assisting, although there are a number of philanthropic grants that may have monies available to assist any non-profit organization. Many large corporations are interested in assisting governments and non-profits to better serve the community, which in turn provides free advertising for them as well as customer devotion to their company. The Department should conduct additional research to try to ascertain which corporate entities will provide grant monies for purchasing new equipment, and potentially, ambulances. A few corporate grants are available through the following resources:

- National Emergency Medicine Association (NEMA) Grant- the Association is concerned with emergency at every stage of trauma, with particular attention paid to excellence in first response at the time and place of an emergency. http://www.nemahealth.org/index.htm.

- State Farm Safety Grant-focuses on prevention and education programs related to fire, home safety and roadway safety. https://www.statefarm.com/about-us/community/education-programs/grants-scholarships/company-grants/.

Smaller sources of funding may be available by faith-based groups that will be predominately encouraged by the charitable aspects of prehospital care provision, as well as the ability to identify as a member of the Community. Some faith-based organizations that could provide funding are Catholic Charities, The Knights of Columbus, The United Methodist Church Foundation, smaller independent community churches and other faith-based organizations. Unlike the government grant process which may simply require an application, philanthropic and faith-based organizations may require a letter of intent as well as a presentation for decision making and tax purposes. If the Department decides to move forward with implementation, it would be in its best interest to have a presentation available describing the benefit of fire department-based EMS transport. This presentation can be used to garner community, as well as financial, support from private foundations.

Additional funding from grants, philanthropic foundations, and other partnerships will be most useful in the year when ambulances and equipment are actually purchased for the Department. That year will be the most expensive spending year due to the purchasing of vehicles, supplies, and other capital expenditures. Other sources of income can be generated by fees charged for other services provided by the Department. Some of these fees will require passage of an ordinance or other city approved method for assigning fees, if not already in place. If the Department is not already doing so, it should consider charging a building inspection fee when performing fire and life-safety inspections. This fee would be for the first and second inspection of a structure and then an additional "penalty fee" for follow up inspections. The Department could also increase revenues if it cites property owners for serious life/safety violations after the third inspection. Examples of violations are blocked egress, inactive egress lighting, un-illuminated exit signage, and other violations the Department determines to need immediate attention. The Department could also increase revenue by charging for plans review of new construction and permits for special events.

Some communities that are the home to colleges, universities, and other large non-profit organizations are at a disadvantage in generating tax revenue from these facilities due to their tax-exempt status. This is a hardship on emergency services because even though there is a lack of income from these institutions, there is still a demand on service, and in some instances, a

significant one. As such, some communities, through a contract, have developed a means to generate "tax" revenue for service in the form of fees. The Department and City should consider creating such a pact with universities, colleges, and non-profits that exist within the response jurisdiction if one is not in place already. This is especially valid for those institutions that house students. Any monies generated should be dedicated solely to the Department and its operations budget. Fees can either be paid directly by the university/ college or passed on to students and charged as a fire and life safety fee on a "per- semester" basis. This fee should be attached as a line item to the student's tuition bill as with other fees. If the University pays a fee directly, the amount can be determined a number of ways. For example, the fee could be a percentage based on the total property appraisal for all properties owned by educational institutions within the response jurisdiction. This is similar to how residential property tax is determined. It can also be calculated as a percentage of operating costs, which includes apparatus, equipment, fuel, and personnel costs and based on the frequency that resources are tasked with response to the campus and other university owned properties. A sample contract between the Town of Plymouth, New Hampshire and The Plymouth State University has been attached for reference in Appendix D.

In addition to these measures to increase revenue the Department should also consider billing for Motor Vehicle Accidents (MVAs), extrications, and establishing air-medical evacuation landing zones, if not already doing so. Some billing companies have been successfully billing auto-insurance companies for these types of responses for some time and a majority of auto-insurance providers have monies earmarked in policy payments for emergency response mitigation. Similar to EMS billing, the person being billed for the MVA may never know that they have been charged.

Unlike EMS billing, billing for MVAs allows the Department to generate revenue for all the resources on the scene including apparatus, personnel, supplies, and certain skill sets such as extrication or scene clean-up. An exception to this is that of personnel and apparatus that are specifically assigned to patient care. Billing for medical personnel and apparatus would be done by billing Medicare or private medical insurance, despite the fact that some auto-insurance policies do have a provision for emergency medical care. This prevents double billing. Furthermore, if an auto-insurance payment does include payment for the transport, the Department must return that portion of payment regarding emergency medical care to the auto-insurance company. In MVA billing, the individual assigned as the payer of the bill is typically the person who has been identified as the person at fault for the incident, which is similar to how billing is determined for hazardous materials spills. As such, when performing MVA billing, the Department will require a crash report from the police in addition to any other reports required. This will take some coordination between municipal departments for information exchange, but involves minimal additional effort for the increased revenue.

Revenue

For this report the IAFF was able to create a revenue projection for the EMS call volume since there were sufficient records from calendar year 2013. This model does not count the cost of ambulance, equipment, and supplies. This projection also does not include the cost of personnel or continued cost of medical supplies (which may vary due to demand and shelf life).

It was assumed that all patient transport bills would be paid in the same calendar year. In reality, bills are not always paid this predictably due to a variety of reasons, including but not limited to, inaccurate billing information, incomplete EMS reports, lack of insurance, or denied claims due to lack of medical necessity. Once all appropriate data has been submitted, payment typically is made as follows- Medicare: 14 days, Medicaid: 14 days, commercial insurers: 30-45 days. Due to changes in healthcare coverage, the lack of insurance may be less of an issue than in previous years. Electronic billing has substantially shortened this period of time for Medicare claims compared to previous years; nevertheless, there is still a delay.

This projection also assumed that the private insurance billing fees for ALS, ALS2, BLS, and mileage was equal to the established Medicare rates for the region. As has been previously discussed, due to Medicare's cost sharing plan it was assumed that the Department only receives 80% of each bill, since this is the portion that Medicare is responsible for paying. The remaining 20% was assumed as a write off in the event that the Department adheres to OIG billing practices and assumes property tax payment as the remaining 20%. The adjusted 80% payment for Medicare was multiplied by the projected call volumes to determine the annual gross collectables over the projection period.

Loaded miles were calculated by calculating the average distance from all the stations to the hospitals. This distance was determined to be 4.0 miles; however, in reality transport mileage will be smaller or larger depending on the proximity of location of the EMS incident to the hospital. This distance was then multiplied by number of projected transports per year, rounded to the nearest 10^{th} of a mile per the mileage payment rule established by Medicare, and then multiplied by the fee per loaded miles from the Medicare fee schedule for the region. It was also assumed a billing company would deduct 8% from each successfully collected bill as its service fee.

Using data provided by Care Ambulance the following percentages were used per billable transport category, BLS: 25.21%, ALS: 36.40%, ALS2: 0.43%, in-field pronouncement of death: 22.

Table 10 provides the revenue projections that could potentially be generated from billing for EMS transport if 50%, 60%, 70%, and 80% of all patients pay. On average departments typically see revenue collection rates between 55% and 80% with improved billing rules and practices. It is important to note that this projection assumes that the amount of revenue generated is equal to

that of the 80% that Medicare pays. In reality this amount could be higher for non-Medicare patients. However, the Medicare rate system provides a stable model to be used in this type of revenue projection. Appendix E provides a detailed breakdown of how this revenue stream was constructed. Using the percentages of billable transports mentioned above, the total billed amount using the Medicare Fee Schedule would equal $1,255,009.94. Minus a 20% credit adjustment, and assuming Medicare approves payment for 100% of the transport invoices submitted, the City would receive $1,004,007.95.

Estimated Gross Revenue Projections

Percentage of Collections			
50%	60%	70%	80%
Estimated Gross Revenue			
$502,003.98	$602,404.77	$702,805.57	$803,206.36
Estimated Raw Collection Rate			
40%	48%	56%	64%
Estimated Revenue per Transport			
$183.28	$219.94	$256.59	$293.25
Net Revenue after 8% Billing Agency Deduction			
$461,843.66	$554,212.39	$646,581.12	$738,949.85

Table 10. Estimated Gross Revenue. The above table shows the gross revenue projections for the proposed EMS service the Department can expect. This gross prediction only takes into consideration the amount of revenue generated assuming 50%, 60%, 70%, and 80% of the total transport population pay for the service. Projection values were generated by assuming that all payors would pay 80% of the approved Medicare rate as it is a stable model of billing. These projections represent revenue earned before and after an 8% billing deduction. The cost of fuel, personnel, startup costs, and perishable medical supplies were not considered in this projection.

The estimated revenue projection does not include billing for other types of EMS service delivery, such as treatment without transport. As previously discussed, the Department could directly bill patients who have been treated but not transported. The bill must be submitted directly to the patient, as typically, insurance will not pay for it and Medicare will only pay for transport. However, there is one exception to Medicare billing regarding no transport and that is infield pronouncement of death. In these instances, if after an ambulance is dispatched to a request for EMS service and finds that the patient is deceased or terminates resuscitative efforts and pronounces the patient deceased, then the service can bill Medicare at the BLS rate using a modifier. Since it is difficult to predict this number from the call volume estimates it was not included in the projection.

Other revenue projections, although not displayed in the body of this proposal, from billing agencies, that are located in the region or in the state, have been included in appendix F. These billing agencies provide service to other fire departments in the state and elsewhere.

The revenue generated through EMS billing and other revenue generators discussed in this proposal should ideally be used to fund the Department and offset costs. If there is a way for the City to withdraw monies from the Department's funds then it should consider creating an enterprise fund.

An enterprise fund establishes a separate accounting and financial reporting mechanism for municipal services for which a fee is charged in exchange for services. In this case- EMS care and transport. In this type of accounting system the revenues and expenditures for services are separated into different funds with their own financial statements, rather than being placed into the general fund for other agencies to have access to.

Specifically, an enterprise fund is established for a utility, health care, and recreational or transportation facilities. In the Department's situation this would fall under the health care option- specifically an ambulance service. Enterprise funds may not be established for normal government operations or services. They also do not create a separate or autonomous entity from the municipality, meaning the Department will still be required to fulfill financial and managerial reporting requirements like any other division or department in the City. Additionally, financial transactions are reported using standards similar to private sector accounting. Revenues are recognized when earned and expenses are recognized when incurred. This provides management and taxpayers with information to measure performance, analyze the impact of financial decisions, determine the cost of providing a service, and identify any potential subsidies that can be garnered from the general fund for the provision of service.

Forming an enterprise fund will also allow the Department to demonstrate to the public the portions of total costs of the service that are recovered through user charges and the portions that are subsidized by tax levy or other available funds. This could be an ideal accounting system for the Department with a new service provision since enterprise funds are frequently used to account for services that are partially funded by fees and charges, as will be the Department's case.

At the end of the year, operating surplus translates into retained earnings that are maintained in the fund rather than returning back to the general fund. However, with an enterprise fund, if an operating loss is incurred, the loss must be raised in the following year's budget.

Generally an enterprise fund may be adopted with the approval of a council vote. It is recommended that the municipality accept the enterprise statute in advance of the budget process and clearly state what services will be provided and when the fund will commence. Typically, unless otherwise designated, the enterprise fund will commence as of the next fiscal year once it has received municipal approval. Once adopted, the municipality may begin the process of transferring the estimated revenues and operating budget of the service to the fund and identifying the capital items, other assets, and liabilities to be transferred from the general fund to the enterprise fund. Once enacted, the Department's budget will be subject to the appropriation

process. Requests are prepared like any other department: any transfers among enterprise line items require action by municipal meetings and the budget will include both revenue and expenditures.

The Future of Key West Fire & EMS

Once EMS transport has been successfully integrated into the Department and the City it will be important for the administration to find ways to maintain the value of EMS. In recent years changes to healthcare laws and delivery have created many unique opportunities never before thought of, especially in regards to EMS.

Nationally, fire-based EMS departments have branched out into many other types of care outside of the traditional 9-1-1 response and transport models. Some of these types of care come with additional sources of revenue and some are simply a means to improve service to the community. This section of the proposal will briefly discuss some additional value-added services as well as specific revenue-added service. It is important to note that the discussed future services are simply a sampling of the possible future service the Department could offer. Additionally, any value-added service, regardless of revenue-generating capabilities, should only be implemented after identification of need and careful planning.

Interfacility Transport

It has been mentioned by a City Commissioner as well as discussed by leadership of IAFF Local 1424 that the Department should consider providing non-emergency interfacility transport within the City limits of Key West. Due to its rural geographic location, and with the loss of 9-1-1 transport, it may potentially be untenable for a private ambulance agency to maintain interfacility transport. The likelihood of this has been enhanced by recent changes to the Medicare Fee Schedule for non-emergency BLS transport of end-stage renal disease (ESRD) patients. Effective October 1, 2013 this level of service received a 10% reduction in reimbursement rates[40]. Given these issues, there may be future opportunities for the Department to provide this level of service to add supplemental revenue.

Interfacility transport is charges patients for local transports to a hospital, a critical access hospital, a skilled nursing facility (SNF), a beneficiary's home, or a dialysis facility for ESRD patients, and is eligible for reimbursement if the transport is medically necessary and reasonable. Necessity of service is established when the patient's condition suggests that any other method of transportation would endanger the health of the patient. Reasonableness refers to the level of service provided, and then only if the services are medically necessary given the patient's condition. More information can be found in The Medicare Benefit Policy Manual, Chapter 10- "Ambulance Services" and The Medicare Claims Processing Manual, Chapter 15- "Ambulance."

[40] CMS Manual System, Pub 110-04 Medicare Claims Processing, Transmittal 2703, May 10, 2013

Mobile Integrated Health-Community Health Provider

Recent changes in healthcare law have created a number of opportunities for prehospital care providers. Hospitals are currently being incentivized to stop readmissions within 30 days of patient discharge from in-patient care, such as the intensive care unit. Home healthcare, SNFs, physician groups and other healthcare organizations are similarly incentivized to keep patients out of the hospital. These incentives were designed as a means to reduce healthcare costs in the United States by focusing primarily on the top three patient conditions that result in readmissions and increased costs. These conditions are patients who have had an Acute Myocardial Infarction (AMI, also known as a heart attack), Heart Failure, and Pneumonia.

Recently, insurance companies have been contacting benefit recipients who are diabetic to make sure that they are picking up and appropriately using their diabetic medications and supplies. Although this is just one example, these insurance providers are also following up with patients with other conditions as a matter of decreasing costs and improving patients' quality of life.

The care of these four conditions, and others, are conditions that are within the purview of an EMS provider's provision of care, but in many states not in their Scope of Practice. A recent concept developing in the EMS profession is that of Mobile Integrated Health-Community Health Provider (MIH-CHP). This level of care uses experienced prehospital care providers with advanced training to meet the non-emergent medical needs of citizens, especially underserved populations to prevent the 30-day readmission and hospitalization, particularly for patients with chronic health conditions. In this type of practice, mobile EMS providers respond in the community to meet non-emergency medical needs. They are integrated with other healthcare providers as part of the patient's care team and are able to provide assessments, point of contact blood lab tests, and on-scene medical interventions if necessary. This practice is provided through partnerships or contracted service with hospitals, SNFs, physician offices, and other similarly situated businesses, as a means to improve service or prevent penalties from Medicare. Revenue for this practice could then be collected as a percentage of savings realized by the partner or contractee or by a direct fee for service. This concept is currently operating in several states using fire-based EMS resources as the mobile provider.

With additional training and partnerships, the Key West Fire Department could be an active participant in improving patient outcomes and quality of life using this new form of practice. Florida Statute Title XXIX Public Health, Chapter 401: Medical Telecommunications and Transportation, § 401.272 "Emergency medical services community health care", provides language allowing for the provision of public health programs pertaining to the prevention of illness and injury.

Immunizations

Florida Statute Title XXIX Public Health, Chapter 401: Medical Telecommunications and Transportation, § 401.272 “Emergency medical services community health care”, also provides language that supports EMS providers performing immunizations. This is an opportunity that could be performed in conjunction with MIH-CHP or as a stand-alone program.

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Conclusion

In conclusion, the Key West Fire Department is well situated to begin an EMS transport service. The addition of EMS transport is of value to a growing population, as well as to a significant group of vulnerable citizens. The implementation of EMS transport by the Department will allow it to offer the highest level of all-hazards protection available in the area, as well as improve its existing disaster capabilities. Certainly the enhancement of services under one centralized chain of command and through a unified dispatch center can only improve the abilities of the City to efficiently and effectively manage any emergency, no matter how large or small.

Through careful creation of a fair and equitable fee schedule, the Department is equally poised to increase revenue from other sources to support the addition of EMS transport services and enhance the safety of the citizens and community at large. Under its current operational model, the City leadership is under-utilizing its resources and losing patient transport revenue to a private-for-profit service. In addition to losing patient transport revenue, the Department is losing revenue through the provision of a necessary first response program that does not receive reimbursement from the private-for-profit service. By implementing an EMS transport service, leaders may be creating a revenue stream to support the Department's all-hazards mission.

Much of the implementation described within this proposal, although frequently regarded as immediate, is anything but immediate. Implementation of an increased level of any service, no matter how basic, must be well planned and coordinated to anticipate as many issues as possible, negative and positive, and to develop protocols for how those issues will be addressed. Contingency plans must be in place to make immediate adjustments to service as issues develop.

As stated throughout this proposal, if the Department has the funds available for personnel and equipment, it may be able to successfully implement an EMS transport service across the response jurisdiction with little difficulty. Although such an implementation presents a large up-front cost, it does reasonably allow the Department to become the premier provider of pre-hospital care in the City. However, the City will need to take time to hire, purchase and plan for the implementation and set a firm date and time for the Department to begin providing transport service. Additionally some of the up-front costs for service implementation can be reduced through a leasing program for ambulances and capital equipment and grants.

Regardless of the manner in which implementation occurs the Department should identify all of the components required by State rules and comparable industry models to ensure a successful operation. Each EMS system is unique. At a minimum the Department will need a Medical Director, Division Chief of EMS, an ePCR system, a billing company, ambulances, personnel and equipment. The Department should become familiar with the rules and regulations for an EMS service as identified by the State of Florida. This document provides the foundation for tasks that

the Department must complete, leaving the remainder of choices based on the Department's understanding of community needs.

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Appendices

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Appendix A: Guide for Medical Directors

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Handbook for EMS Medical Directors

March 2012

FEMA

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U.S. Fire Administration

Mission Statement

We provide National leadership to foster a solid foundation for our fire and emergency services stakeholders in prevention, preparedness, and response.

FEMA

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Preface

Colleagues:

The Department of Homeland Security (DHS) Office of Health Affairs (OHA) and the U.S. Fire Administration (USFA) are pleased to deliver this *Handbook for EMS Medical Directors* of local departments and agencies involved in emergency medical services (EMS) response.

Medical directors provide critical oversight and medical direction to ensure that effective emergency medical care is provided to millions of patients throughout the United States. In addition to providing medical oversight and direction, EMS medical directors support EMS personnel and first responders through training, protocol development, and resource deployment advice. This handbook provides a baseline overview of key roles and responsibilities to assist current and prospective medical directors in performing their important missions.

On behalf of the U.S. DHS, we thank you for your service to the Nation's EMS.

Sincerely yours,

Alexander G. Garza, M.D., M.P.H.
Assistant Secretary for Health Affairs and
Chief Medical Officer

Ernest Mitchell, Jr.
U.S. Fire Administrator

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Acknowledgements

The Handbook for EMS Medical Directors was developed by the International Association of Fire Chiefs (IAFC) as part of a Cooperative Agreement with the Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA), U.S. Fire Administration (USFA), and was supported by DHS, Office of Health Affairs (OHA). The IAFC Emergency Medical Services (EMS) Section provided oversight in the development of the handbook.

A project team representing EMS stakeholder groups worked together to develop, contribute, and author the handbook. The following individuals are extended the greatest amount of appreciation for their expertise, effort, and dedication throughout the handbook development process:

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In addition to the project team, many industry professionals contributed time, information, and efforts to aid in the production of this handbook. Industry stakeholder groups reviewed and provided feedback during the handbook's production and their efforts are greatly appreciated. Listed below are the stakeholder groups and their representatives who reviewed the handbook.

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The project team and sponsoring agencies extend their appreciation for the professional support and cooperation provided during the review process. The efforts of the project team, contributors, and authors will aid in the education of those who read the handbook and will result in improved understanding of the multifaceted role of an EMS agency medical director.

Introduction

The position of an emergency medical services (EMS) agency medical director allows the opportunity for a physician to become engaged in the unique and ever-evolving realm of out-of-hospital care, a clinical practice offering a distinct set of challenges, and rewarding impacts in improving a community's emergency medical care abilities. For most, the driving force behind the desire to become an EMS agency medical director stems from a deep passion for helping patients in times of marked acute medical need whenever and wherever the need appears. Yet, understanding the nuances involved in the oversight and direction of an EMS agency requires specialized knowledge, skills, and abilities beyond the typical curriculum of emergency medicine or alternative acute care medical practices. It is for this precise reason that EMS has been recently recognized by the American Board of Medical Specialties as a formal physician subspecialty.

The purpose of this handbook is to provide assistance to both new and experienced medical directors as they strive to provide the highest quality of out-of-hospital emergency medical care to their communities and foster excellence within their agencies. The handbook will provide the new medical director with a fundamental orientation to the roles that define the position of the medical director while providing the experienced medical director with a useful reference tool. The handbook will explore the nuances found in the EMS industry–a challenge to describe in generalities due to the tremendous amount of diversity among EMS agencies and systems across the Nation. The handbook does not intend to serve as an operational medical practice document, but seeks to identify and describe the critical elements associated with the position.

EMS medical direction is a multidimensional activity that includes the direction and oversight of administrative, operational, educational, and clinical actions related to patient care activities. The medical director is an integral leader in an EMS agency and will serve as the interface between the agency and the medical community. The medical director must have a collaborative and cooperative approach to working with the EMS agency, as there are many who will work in concert to ensure the agency is functioning optimally.

The EMS workforce is a diverse, creative, committed, and often very street-savvy group of providers. The medical director can be most effective by meshing the physician passions for patient beneficence, scientific discovery, ethical practices, and professional development to the enthusiasm and dedication within the EMS culture. Achieving success as a medical director depends on many things. Inherent among them is a tremendous amount of motivation, willingness to learn while simultaneously teaching, and enacting solid leadership skills, all while reinforcing the roles of patient advocate, mentor, and coach. The successful medical director is equally analytical and resourceful. The medical director must focus on how to improve their agency and the service that it delivers on a continual basis. Involvement with this aspect of emergency care can be extremely rewarding, challenging, as well as personally and professional fulfilling. Physicians electing to pursue the role of a medical director are to be commended for their dedication and critical position they will hold in the public safety and health care arenas.

The handbook's chapters identify and discuss the components of an EMS agency and its agency stakeholders, the position of a medical director, and the medical director's role in agency oversight. The handbook contains appendices that include

- medical director's checklist;
- glossary;
- acronym guide;
- sample agreement of service documents;
- sample liability insurance documents;

- industry regulations and standards; and
- sample performance measures.

These reference items will aid in a physician's understanding of the general role, needs, and requirements for the medical director position.

The EMS Agency and Its Stakeholders

Overview

The emergency medical services (EMS) system describes a continuum of care beginning with initial contact and response through patient care and transport to an appropriate receiving facility. EMS also has grown in its involvement in other areas of out-of-hospital care including disaster and mass casualty planning and injury prevention. The "EMS Agenda for the Future" describes prehospital medicine as the practice of providing emergency care that is remote from a health-care facility, in all of its complexities.[1]

An EMS agency is a coordinated arrangement of personnel, equipment, and facilities organized to respond to medical emergencies regardless of cause. Since the care of patients in the EMS arena also includes those patients needing movement between health-care facilities (e.g., hospital to nursing or rehabilitation facility) and not just their entry into the health-care system due to an emergency, the term out-of-hospital care is also used to describe the EMS environment.

EMS History

EMS can trace its roots to humble beginnings and unlikely sponsors. During the early to mid-20th century, funeral homes operated the majority of vehicles used for "EMS." The funeral homes' hearses could accommodate the need to transport a body on a stretcher and served a dual purpose by either taking the dead to the funeral home or the living to the hospital. For the most part, funeral home personnel were not trained in patient care and could do little more than rapidly drive the living to the hospital and hope their condition would not deteriorate during the trip.

Early EMS agencies, commonly called rescue squads, developed in an inconsistent manner and widely varied across America's communities, especially following the end of World War II. Military campaigns have been a considerable source for many of the advancements in the civilian out-of-hospital environment. On the battleground, there was an emphasis to rapidly treat and move the wounded soldier to a treatment area. Equipment designed for the battleground quickly became adapted into the out-of-hospital environment. World War II saw the birth of the combat medic who could administer medications such as morphine and plasma in the field, serving as the original model for advanced life support (ALS) in the civilian world. The rapid movement of wounded through the use of helicopters during the Korean and Vietnam Wars was also replicated in the civilian environment.

However, there was a dearth of any standards, a void of training programs, and sporadic availability of equipment. This all began to change when the National Academy of Sciences produced a report titled "Accidental Death and Disability: The Neglected Disease of Modern Society" in 1966. This publication called attention to the poor condition of emergency medical care in America by focusing on roadway trauma and deaths. Reacting to the initial link between vehicular-related trauma and inadequate EMS care, President Johnson signed the National Traffic and Motor Vehicle Safety Act of 1966. This law focused on the development of standards for highway accident victims and served as the foundation to address the fundamental deficiencies in EMS agencies. When President Johnson signed the National Traffic and Motor Vehicle Safety Act of 1966 and Federal funding became available, EMS systems quickly developed across the United States.

The Highway Safety Act of 1966 created a new Federal agency within the National Highway Safety Bureau, the predecessor of the National Highway Traffic Safety Administration (NHTSA). NHTSA was responsible for the development and implementation of EMS legislation, training standards, and agency funding that was allocated to States, regions, and locales to support EMS agencies.[2] Parallel to NHTSA's work, pioneering EMS physicians in geographically diverse areas such as Seattle (Dr. Leonard Cobb and Dr. Michael Copass),

Los Angeles (Dr. Michael Criley), New York City (Dr. Sheldon Jacobson), Columbus (Dr. James Warren), and Miami (Dr. Eugene Nagel) mentored and created a new level of sophisticated professional for out-of-hospital emergency medical care, what we now commonly refer to as the "paramedic." In the next few years, textbooks were created to support these new training curricula, reflecting an expanded scope of services to address acute medical illness as well as trauma.

In pursuit of establishing uniform training and examination standards, the National Registry of Emergency Medical Technicians (NREMT) was founded in 1970. The NREMT created a national certification agency for those individuals involved in the delivery of EMS. Mainstream media attention for EMS was gained in the early 1970s when Hollywood brought the television show "Emergency!" into American homes. The television show experienced widespread popularity and greatly contributed to improving the public's knowledge and attitude toward the value and importance of EMS, not to mention recruiting a generation of EMS providers who continue to be active in field practice, education, and administration.

It was in 1971 that an individual by the name of James O. Page, working for the Los Angeles County Fire Department, was assigned to coordinate the countywide implementation of one of the Nation's first paramedic rescue services. Jim Page served as technical consultant and writer for "Emergency!" and later founded the "Journal of Emergency Medical Services" (JEMS) publication. At the time of his untimely death, he was a retired fire chief and was serving as publisher emeritus of JEMS and "FireRescue Magazine," while also a partner in the national EMS law firm of Page, Wolfberg, and Wirth. Jim Page is easily recognized as one of the most influential individuals in the development of EMS.

The EMS System Act of 1973 (Public Law 93-154) was passed by Congress and provided funding for several hundred EMS systems across the Nation. The EMS System Act defined an EMS system and its essential components:

> "[An EMS system] provides for the arrangement of personnel, facilities, and equipment for the effective and coordinated delivery of health care services in an appropriate geographical area under emergency conditions (occurring either as a result of the patient's condition or of natural disasters or similar situations) and which is administered by a public or nonprofit private entity which has the authority and the resources to provide effective administration of the system."[3]

The EMS System Act identified 14 critical components of an EMS system:

1. Integration into the health-care system.
2. EMS research.
3. Legislation and regulation.
4. System finances.
5. Human resources.
6. Medical direction.
7. Education systems.
8. Public education.
9. Prevention.
10. Public access.

11. Communication systems.

12. Clinical care.

13. Information systems.

14. Evaluation.[4]

In 1979, emergency medicine became recognized as a specialty by the American Medical Association (AMA) and the American Board of Medical Specialties (ABMS). The AMA also recognized the emergency medical technician (EMT)/Paramedic as an allied health occupation. During the same time period, the first national standard for paramedic training was developed and professional associations for EMTs were formed.[5] One of these professional associations was the National Association of Emergency Medical Technicians (NAEMT) which is the largest professional association for EMS practitioners today.

The early 1980s brought continued efforts to standardized testing for EMS providers. The American fire service had recognized the value of EMS delivery and a preponderance of fire departments had integrated some level of EMS care in their delivery model. In 1981, direct Federal funding established by the Highway Safety Act of 1966 was switched to State block grants. The block grants were not strictly tied to EMS system development which resulted in some States electing to divert the funding to other public health initiatives judged to be more pressing. EMS systems across the Nation continued to develop inconsistently due to the wide variability among the State EMS offices and funding availability.[6] In 1985, the National Association of EMS Physicians (NAEMSP) was formed, recognizing the importance of physician involvement in EMS systems.

In the early 1990s, attention turned to improving several initiatives that were introduced in the previous decades. One example involved the three-digit emergency number, 9-1-1. While 9-1-1 was created in the 1960s, its widespread adoption and appropriate use became a focus of public education campaigns in the early 1990s. Trauma system development began in the 1960s and experienced further growth during the 1990s with emphasis on the development of comprehensive trauma systems that matched patient needs with specialized, regionalized resources. EMS managers also recognized the need to perform EMS system strategic planning to further integrate EMS into the health-care system. EMS became increasingly recognized as an important component in the continuum of health care, rather than an external system that merely delivered patients to the doorstep of the traditional health-care system. Forward thinkers began to realize that patient care could be optimized if systems were designed to include strategies for patient care beginning with their first contact with the EMS system.

Another landmark EMS-related publication was produced in 1996. NHTSA and the Department of Health and Human Services' (HHS's) Health Resources and Services Administration published a Federally funded consensus paper titled "EMS Agenda for the Future." This publication strived to establish a common vision and roadmap for the continued development of EMS systems. This roadmap was applicable to all levels of EMS agencies at the national, State, and local levels. The paper stated an overall vision for future EMS systems:

> "Emergency Medical Services (EMS) of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to treatment of chronic conditions and community health monitoring. This new entity will be developed from redistribution of existing health care resources and will be integrated with other health care providers and public health and public safety agencies. It will improve community health and result in a more appropriate use of acute health care resources. EMS will remain the public's emergency medical safety net."[7]

In 2000, NHTSA released a followup report to "EMS Agenda for the Future." The new report was titled "The EMS Education Agenda for the Future: A Systems Approach." This report identified the need to develop an educational certification and licensure system that would achieve national consistency for entry-level EMS personnel.

"The EMS Education Agenda for the Future" identified the need to have an EMS education system which integrated five major components:

1. National EMS Core Content.
2. National EMS Scope of Practice Model.
3. National EMS Education Standards.
4. National EMS Certification.
5. National EMS Education Program Accreditation.[8]

While EMS can celebrate numerous and extensive successes, EMS systems remain fragmented, overburdened, and underfunded as identified in the 2006 Institute of Medicine's (IOM's) report titled "Emergency Medical Services at the Crossroads."[9] The IOM report examined a variety of issues affecting the delivery of EMS and recognized the extent of fragmentation in the Nation's EMS systems that add complexity and variability in how EMS is delivered. The key areas impacting EMS systems were identified as:

- insufficient coordination;
- disparities in response times;
- uncertain quality of care;
- lack of readiness for disasters;
- divided professional identity; and
- limited evidence base that support current EMS practices.[10]

The IOM report called for improvements through a series of recommendations so that EMS systems could evolve into highly coordinated and accountable systems that functioned on a shared regional basis versus operating independently or in a vacuum. The committee's findings and recommendations have broad categories of:

- Federal lead agency;
- system finance;
- regionalization;
- national standards for training and credentialing;
- medical direction and EMS physician subspecialization;
- coordination;
- communications and data systems;
- air medical services;

- accountability;
- disaster preparedness;
- research; and
- achieving the vision.

For more information on any of the mentioned publications, the following website provides information and links to the documents: www.ems.gov/

The Modern EMS System

The modern EMS system consists of those organizations, individuals, facilities, and equipment that are required to ensure timely and medically-appropriate responses to each request for prehospital care and medical transportation. Each State, community, and agency has a distinct history and culture with respect to the EMS system. The medical director needs to understand the various requirements, culture, and the unique relationship between each agency and local and State government, as well as the relationships between providers and leadership within the agency.

Within the United States, EMS personnel treat nearly 20 million patients a year with many of these patients experiencing complicated medical or traumatic events.[1] The response, care, and transport of these patients require considerable knowledge, skills, and abilities (KSAs) on the part of the provider. The out-of-hospital environment presents numerous challenges to these skilled providers and to the agencies that support their operations.

The National EMS Scope of Practice Model identifies what procedures an EMS provider is authorized to perform by the level of provider certification or licensure. However, the National EMS Scope of Practice Model is not accepted by all States. In States where the National EMS Scope of Practice Model is not accepted, there may be other governmental authorities (State, regional, or local) who establish and define the scope of practice (specific medical procedures and interventions which may be performed) for EMS providers.

While the scope of practice defines the medical procedures and interventions that a provider is legally authorized to perform, it does not identify the standard of care. The standard of care within the EMS industry is established by identifying the level of care provided by equally trained personnel given the same situation. At the provider's agency level, the medical director needs to work cooperatively as part of the agency's leadership to establish the patient care culture through the implementation of policies, procedures and protocols, training, continuing education, and continuous quality improvement programs.

EMS personnel are unique health-care professionals in that they typically provide medical care in the out-of-hospital setting following their EMS agency's protocols and procedures, as approved by their medical director. Medical direction is a critical component in all aspects of an EMS agency's operations. A medical director may establish local protocols or assimilate regional or State structured protocols for use in their agency. Protocols are written medical standards for EMS practice, as well as the expected patient care procedures to be performed in a variety of situations. The latitude that a medical director may have in writing and establishing their own patient care protocols varies by region and State. Medical direction can also be administered online, or direction provided via electronic telecommunications to onscene or in-transit EMS personnel. By convention, online medical direction is immediately available and provided by a physician at a medical facility designated by the EMS agency.

To attempt to describe these agency components and relationships, a football analogy may be helpful. Protocols are to the EMS providers as the playbook is to the players. The medical director is the head coach

for the entire team. As the protocols are put into play, there may be times the quarterback needs to quickly confer with the coach or assistant coach about a specific play in the field, and that is done using a radio in the same manner EMS providers use online medical direction.

EMS Agency Design Types

Today, virtually all communities throughout the United States have some type of EMS system. Though community expectations for an EMS system may vary based on locale and a particular community's risk tolerance levels, most modern EMS systems were designed by State statute and by local agency leaders to address the communities' need for a provision of timely, skilled emergency care at the point of illness or injury. EMS systems vary in clinical sophistication, performance measures, and economic efficiency.[12] There are different configurations of EMS systems in the United States and there is minimal evidence and considerable debate as to which approach may be the most effective.

Nearly all Americans have access to the 9-1-1 emergency phone number. This is the entry point into an EMS system that most people use. In some areas, trained call-takers and dispatchers use structured emergency medical dispatch programs to perform call triage, dispatch the most appropriate response personnel, and provide prearrival instructions to bystanders so that basic care can begin prior to EMS arriving. While the use of emergency medical dispatch programs is not consistent across the United States, their implementation and use is ever-increasing.

How emergency response resources are deployed following dispatch to calls for assistance is dependent upon a community's system configuration. In many communities, first responders are deployed from municipal fire or police departments. Ambulances (transport units) may also be deployed from fire departments, hospitals, third service, or private provider locations. Volunteer fire and rescue agencies were an early and common provider of both first responder and ambulance transport services, and remain an integral part of many EMS systems.

There are at least two EMS provider levels in most communities. These include basic life support (BLS) and ALS providers. Generally, BLS response units will have equipment sufficient to address initial patient care intervention including oxygen, fundamental airway support devices, bandaging and splinting devices, as well as automated external defibrillators (AEDs). ALS response units will have more highly trained and certified EMS providers and carry all the BLS equipment, in addition to complex patient intervention equipment such as advanced airway devices, intravenous fluids, medications, and cardiac monitors typically capable of 12-lead electrocardiography, transcutaneous pacing, as well as defibrillators capable of defibrillation and synchronized cardioversion.

Some EMS agencies may not be responsible for initial 9-1-1 responses. These agencies may be needed in special circumstances such as supplemental transport services (e.g., aeromedical units, critical or neonatal care units, etc.) or interfacility transport needs. Based on the agency configuration, they may offer BLS, ALS, or both levels of care.

Listed below are brief descriptions of the most common agency types in the United States. It is important to note the following descriptions are generic in nature; there are exceptions to these descriptions and one agency may fit into multiple categories.

Multiple-Role EMS Agency

A multiple-role EMS agency will cross-train their personnel to provide various services. A common example of a multiple-role EMS agency is a fire-based EMS agency. There are also multiple-role EMS agencies which provide rescue services, but not fire suppression. Less common are combined public safety agencies that provide cross-trained personnel to provide all three services of law enforcement, fire, and EMS services.

In fire-based EMS agencies, medical responses are provided by fire department personnel trained as emergency responders, EMTs, or paramedics. The integration of EMS into the public safety sector makes use of preexisting transportation infrastructure and personnel who are already trained to function in emergency conditions.

Single-Role EMS Agency

A single-role EMS agency provides EMS services only and personnel are not cross-trained to provide firefighting or other additional services. Single-role EMS agencies may be municipality based or privately owned and work closely and cooperatively with other public safety agencies.

Hospital-Based EMS Transport Agency

A hospital-based EMS agency, in the simplest of terms, means that a hospital has oversight and operational responsibility of an EMS agency. These types of agencies may be public or private and vary in how their EMS care is deployed. Some hospital-based agencies may operate in combination with the other community emergency responders (e.g., fire department) while others may provide a separate and independent EMS agency. Traditionally, hospital-based agencies are private and may be either for-profit or not-for-profit entities. These types of agencies are often found connected with large teaching hospitals and their provider base may also function within other areas of the hospital at times.

Private EMS Agency

Private EMS agencies are individually or corporately owned and operated companies. These agencies may provide nonemergent or emergent ambulance transport services. In the nonemergent setting, private EMS agencies often provide extensive scheduled intrafacility services to a community or region. Private EMS agencies can be for-profit or not-for-profit.

Third-Service EMS Agency

In a third-service EMS agency, there is an entity that provides EMS service in a manner that is separate but alongside the fire and police public safety personnel in the community. For example, a community may have the fire department provide the first response to initiate immediate patient care which will be followed by the arrival of a separate governmental-based EMS agency or a private EMS service to provide the ambulance transports.

Public Utility EMS Agency

In a public utility EMS agency structure, the local government regulates, oversees, and coordinates the provision of EMS throughout the community. The government is responsible for the entire agency performance and may own the equipment, apparatus, and perform insurance billing, but will contract with a separate entity for the personnel requirements.

EMS Agency Staffing Types

Teamwork is an integral component of successful EMS delivery and the medical director needs to understand how an agency's culture, procedures, protocols, and State regulations affect the service delivery. The backbone of any EMS agency is its personnel. Agency types vary from community to community based on a number of factors that include agency history and evolution, funding resources, geographic and population densities, as well as community risk tolerances and expectations. EMS agencies may be made up entirely of career (paid) personnel, volunteers, or a combination of the two. A medical director will interact with the administrative, operational, and provider level personnel of an agency. This interaction requires skills to perform as an educator, an advisor, a coach, a mentor, a leader, and a technical expert.

Career

EMS agencies that are career-based pay their providers for performing their role as an EMS provider. In general, EMS agencies in urban areas typically have career personnel. Within these areas, there is a strong trend for the municipal fire department to provide both EMS and fire suppression services, either as a single or multirole provider format. Other urban delivery models include those where single-role EMS personnel are employed by a municipality, hospital, or with private ambulance companies.[13]

Career-based EMS agencies can achieve a great deal of standardization and consistency of staffing levels as agency leaders can manage the workforce through employer oversight and mandated activities.

Volunteer

Volunteer EMS agencies rely on personnel who participate with the service without typically being compensated for their time. While some urban agencies have active involvement from volunteer EMS providers, the majority of volunteer-based EMS agencies are located in suburban and rural settings. The amount of volunteer activity within the EMS industry makes it unique when compared to other types of health-care occupations.

Volunteer-based EMS agencies may experience more variability in their staffing level consistency and face challenges in managing a force that is confronted with competing time commitments and increasing demands of training and continuing education requirements, particularly at the ALS certification levels.

Combination

A combination agency will use both career and volunteer personnel. Combination agencies attempt to achieve some cost savings by using volunteers, thereby reducing the amount of salaried employees. However, the viability of a combination agency is strongly dependent on the community's ability to supply and sustain a pool of interested and engaged volunteers.

Medical directors may find that many agencies experience an evolutionary process where the agency may be transitioning from a complete volunteer agency to a combination agency, and then into a full career agency. Regardless of the EMS agency type, all providers must be held to the same standard of patient care excellence.

The delivery of EMS can be physically and mentally demanding, and dangerous situations and environments are frequently encountered. Occupational injury rates are common and EMS personnel experience occupational death rates comparable to firefighters and police officers.[14] EMS agencies may experience EMS provider turnover due to injury, burnout, or occupational-related stress and a medical director must understand how the environment can have significant impacts on the providers.

Types of Response Service

EMS agencies develop and are designed to meet a community's needs and expectations. In an effort to match responding resources with the need, agencies may offer only one service level response and transport or be tiered to offer both BLS and ALS services.

As a medical director, it is critical that you become familiar with all the organizations involved with the EMS agency in your area and understand how these entities contribute to the structure and design of that agency.

Single-Tier Response Service

In a single-tier agency design, every EMS response, regardless of call type, receives the same level of personnel expertise and equipment allocation. These agencies provide initial response and transport at one level of care, which may be all BLS or all ALS.

Tiered Response Service

In a tiered agency delivery design, levels of response are broken down into layers or tiers. An example of this type of service is to have first responders provide the BLS tier and then have paramedic-staffed ambulances provide the ALS tier of service. Tiered agencies will often use various vehicle types in their service delivery model (e.g., first response sedans or sport utility vehicles (SUVs), fire apparatus, as well as ambulances, etc.).

In a tiered agency, the initial call triage performed by 9-1-1 call-taker becomes a key element in matching the resources dispatched to the caller's needs.

Resource Deployment

In addition to whether an agency has a tiered approach to service delivery, deployment of resources is another consideration in agency design. There are typically two types of resource deployment: fixed or dynamic.

Fixed Deployment

In a fixed deployment model, EMS response vehicles are dispatched from a static location within a response area, like a fire or EMS station that is strategically positioned within the community for efficient response.

Dynamic Deployment

Dynamic deployment is often referred to as **system status management**. In this deployment model, EMS response vehicles are positioned at various locations within a given response area. These posting sites are selected following a retrospective analysis of call volume and locations in order to statistically predict where the next call may occur. Vehicles may post in parking lots, buildings, or park along a street location and their positions may change based on real-time factors influencing the system.

Emergency Medical Dispatch

As previously mentioned, nearly all Americans can access 9-1-1 as the entry point to access the services of an EMS system. Municipally-operated 9-1-1 communications centers are referred to as Public Safety Answering Points (PSAPs). PSAPs are commonly a fire or rescue, law enforcement, or jointly controlled and operated center. Depending on the municipality, private EMS agencies may not be included in the 9-1-1 deployment resources, unless they are specifically contracted to provide a service to the municipality.

PSAPs can differ in design and resources. Some PSAPs are cross functional managing all calls for public safety resources (EMS, fire, or police) and personnel are cross-trained in the call-taking process, emergency medical dispatch (EMD) procedures and dispatch of resources. Other PSAPs may be segregated into separate sections. As an example, the 9-1-1 call may be answered by a police trained call-taker who will quickly determine the nature of the call as EMS, fire, or police. If the call is medical in nature, the police call-taker would forward it to the EMS section of the PSAP for subsequent questioning and dispatch of resources.

Regardless of how the PSAP is designed or 9-1-1 calls are routed, there are common fundamental activities. EMD programs should employ a system of medical questioning to assess the caller's actual emergency, gain additional information, and/or offer basic medical care intervention instructions over the telephone, called "prearrival instructions" (e.g., bleeding control, cardiopulmonary resuscitation (CPR)). EMD programs use a finite list of common chief complaints, each having associated predetermined questions. Answers to these questions ultimately dictate the resources sent to the scene and how those resources will travel (nonemergency driving or use of lights and sirens). There are several commercially available EMD programs for which the agency's medical director working with the PSAP manager could adopt for use.

Traditionally, the medical director had oversight responsibilities for providers in direct contact with patients. With the evolving standard of care for EMD, many medical directors now have program oversight duties in their agency's PSAP. To provide appropriate EMD program oversight, the medical director must develop a working knowledge of the following related items:

- scope of practice for EMD programs;
- any local, State, and national level legislation related to 9-1-1 PSAP functions;
- the PSAP's general operations, organizational structure, administration, training, and quality improvement activities; and
- the authority of the medical director relating to developing, approving, revising dispatch procedures and protocols, and their role in overall quality management of the PSAP.

Of critical importance, the medical director must ensure there is seamless transition between the EMD program's protocols and prearrival instructions and the EMS agency's field response protocols and policies.

Emergency Response Components

Local emergency response agencies often provide an "all-hazards" response capability. This means the agency's resources will respond to any and all types of natural or manmade incidents. During large scale or technically complex incidents, the EMS resources need to function in a collaborative manner with other response agencies. An incident management system is an organizational structure that integrates resources in a hierarchal organization to improve coordination, effectiveness, and efficiency in the management of an event.

The National Incident Management System (NIMS) is used in the United States for the coordination of Federal, State, and local agencies. The Federal Emergency Management Agency (FEMA) has well-developed training programs in NIMS. The level of the training program required is based on the level of responsibility an individual is expected to have during an incident. Regardless of the type, scope, or scale of an incident, a medical director must become trained and operationally familiar with NIMS.

All medical directors should complete FEMA IS-100.b: *Introduction to Incident Command System (ICS)*, FEMA IS-200.b: *ICS for Single Resources and Initial Action Incidents*, and FEMA IS-700.a: *NIMS An Introduction*. Depending on the local community's threat assessment, the EMS agency may want the medical director to complete additional NIMS training such as FEMA IS-230b: *Fundamentals of Emergency Management*, FEMA ICS-300: *Intermediate ICS for Expanding Incidents for Operational First Responders*, FEMA IS-346: *An Orientation to Hazardous Materials for Medical Personnel*, FEMA IS-520: *Introduction to Continuity of Operations Planning for Pandemic Influenzas*, and FEMA IS-800.b: *National Response Framework, An Introduction*. The medical director should work closely with their local agency to identify the appropriate classes. FEMA's website has a wealth of information explaining NIMS training and links to online courses. The link for more information is: www.fema.gov/emergency/nims/

Medical directors must have a comprehensive understanding of their EMS agency's role and responsibility before, during, and following incident response, stabilization, and resolution. The medical director is responsible for being engaged in planning, overseeing patient care, performing agency improvement activities, and having knowledge of related peer-reviewed medical literature, as well as industry standards, so that future incidents have better outcomes, increased efficiency, and enhanced effectiveness.

In some EMS agencies, providers may operate in difficult conditions, remote areas, or need to perform specialized skills. Oversight of these unique environments that require specialized skills and training will require specialized medical direction. The frequency with which an EMS agency engages in these events will influence the amount of specific knowledge and involvement a medical director will need to have.

Listed below is an overview of several response components that may be applicable to a medical director's individual agency in their all-hazard environment.

Disasters or Multiple and Mass Casualty Incidents

EMS agencies will respond to disasters of all types and scales. Disaster planning is vital and often complex in nature. A medical director should become engaged in the planning process and understand what the agency's expected response will be. A local resource that a medical director may find extremely helpful is the agency's emergency management division or a community-based organization responsible for local disaster response plans such as a Local Emergency Planning Committee (LEPC) or Emergency Management Agency (EMA).

The acronym MCI is typically used interchangeably when referring to both multiple and mass casualty incidents. Multiple casualty incidents are incidents involving multiple patients that can typically be managed using a system's existing resources. Multiple casualty incidents usually have an intense but relatively short operational period. In contrast, mass casualty incidents involve a greater number of patients and will overwhelm the responding agency or system's resources. Mass casualty incidents tend to have a greater, sustained period of operations. Multiple casualty incidents occur more often than mass casualty incidents or large scale disasters. In some busy urban areas, multiple casualty incidents may occur on a daily basis (e.g., crashes involving multiple vehicles and multiple patients).

Following the declaration of a MCI or a disaster, the incident management system will engage and a well-structured flow of incident control activities that include patient triage, treatment, and transportation should occur. A medical director should be familiar and involved with the agency's policies regarding the management of these incidents.

The National Fire Protection Association (NFPA) has a published industry standard related to disaster and MCI responses which the medical director may want to become familiar with. This is NFPA 1600, *Standard on Disaster/Emergency Management and Business Continuity Programs.*

Disasters and MCIs are situations where a medical director may be called to the scene by EMS personnel. Onscene roles and activities will be discussed later in the handbook.

Technical Rescue or Medical Search and Rescue

EMS resources may be called upon to provide medical support or be directly involved in technical rescue operations or search and rescue incidents. Technical rescues may include rope rescue, trench rescue, confined space rescue, swift water rescue, urban search and rescue, building collapses, or other specialized situations requiring a specific skill set. Personnel involved in these types of events are highly trained and deployed when conventional rescue techniques will not meet the needs of the specific incident.

Search and rescue incidents include the systematic search for persons who are lost or in distress on land or inland waterways. These incidents may occur in wilderness zones and include ski, cave, forest, and waterway areas.

Medical directors of these types of agencies must become familiar with the specific training requirements and nature of technical rescue incidents; although, all medical directors should be aware these could impact their local EMS resources. FEMA has designated Urban Search and Rescue (US&R) teams across the nation. US&R teams may have their own medical doctors who have received specialized training for the types of environments and responses these teams become activated for.

NFPA has a published industry standard related to technical rescue responses that the medical director may want to become familiar with. This publication is NFPA 1670, *Standard on Operations and Training for Technical Search and Rescue Incidents.*

Occupational Safety and Health Administration (OSHA) also has related industry standards that impact technical rescue operations. OSHA's regulation 29 CFR Part 1910: *Occupational Safety and Health Standards* has several subparts that medical directors should become familiar with.

Special or Mass Gatherings Events

Organizers of special events may seek preapproval for use of EMS agency resources to provide medical support for mass gathering events. Examples of mass gathering events can be sporting events, entertainment gatherings, rallies, and community activities. Preplanning activities are especially vital for these events and will require preevent analysis, staffing resource evaluation, and interagency coordination needs. Medical directors should be involved during the planning activities to understand the scope and demands that may be placed on the agency.

Hazardous Materials

A hazardous material (hazmat) is a substance or material that poses a risk to health, safety, or property and is governed by Federal regulations when transported in commerce. EMS agencies can be tasked with responding to a hazmat scene. All medical directors need to have a general knowledge of the medical issues involved in hazmat responses. Those medical directors who oversee hazmat teams must have additional training to be prepared for these types of incidents. There are some agencies with hazmat teams that are electing to implement programs, such as the Tox-Medic© program, for specialized advanced hazmat life support training, with a focus on chemical behavior and toxicology for paramedics that will provide medical surveillance and care to hazmat team members and patients exposed to chemical, biological, and nuclear exposure incidents.

NFPA has published industry standards related to hazmat emergency response which the medical director may want to become familiar with. Three hazmat-related NFPA standards are:

- NFPA 471, *Recommended Practice for Responding to Hazardous Materials Incidents.*
- NFPA 472, *Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents.*
- NFPA 473, *Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents.*

NFPA also has several standards related to provider protective ensembles to be worn during hazmat-related incidents that can be referenced if the medical director is requested to provide input on protective clothing for hazmat incidents.

OSHA's regulation 29 CFR Part 1910.120 and several subparts are applicable in these situations. In addition, the National Institute for Occupational Safety and Health (NIOSH) has publications related to the selection and wearing of respirators which are also applicable.

Wildland

Wildland refers to wilderness areas that are found in preserves, estates, farms, conservation preserves, ranches, national forests, national parks, and along rivers, gulches, or otherwise undeveloped areas within or near large urban areas. EMS providers may be called to support a wildland fire incident. Wildland incidents are typically based out of remote camp locations where providers from multiple areas will work together to render aid as needed.

A challenge in large scale wildland fire events is how responding EMS providers are covered by medical director oversight. An EMS provider's ability to function under the authority of their local medical director

becomes questionable when responding into another State or on Federal property. If a medical director is involved with an agency that may provide wildland fire support, the medical director must become familiar with local, State, and Federal regulations regarding issues related to EMS provider physician oversight and protocol usage and consult with the local fire chief or emergency manager.

NFPA has a published industry standard related to wildland responses which the medical director may want to become familiar with. This is NFPA 1143, *Standard for Wildland Fire Management* and NFPA 1051, *Standard for Wildland Fire Fighter Professional Qualifications*. Other resources may be referenced from the National Wildfire Coordinating Group (NWCG), an organization with representatives from each Federal land management agencies and the National Association of State Foresters.

Tactical EMS

EMS providers may be requested to support high hazard tactical law enforcement incidents. In order to properly support these situations, there is specialized training available for tactical medics. Counter Narcotics and Terrorism Operational Medical Support (CONTOMS) is a nationally recognized tactical medical support program for law enforcement and military operations established by the HHS, DHS, and the U.S. Park Police.

CONTOMS offers a medical director's course that is specifically designed for those who will be providing medical direction for EMS providers operating in this type of role. Tactical environments require different approaches and procedures than the routine civilian emergency environment and this course outlines specific policies, protocols, and issues associated with overseeing a program of this nature.

Other organizations may also have tactical EMS-related training programs. As an example, the National Tactical Officers Association offers EMS provider tactical training and a specific medical director course is under development at this time.

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Becoming a Medical Director

Physicians interested in becoming a medical director enter into an aspect of emergency medical care that is distinct from the emergency department. It will present a realm of challenges that will require analytical, clinical, managerial, and leadership skills. Medical direction is essential to ensure patient care that is high quality, efficient, effective, and safe for patients as well as for providers.

The handbook is designed for all agency medical directors—from small agencies and neophyte medical directors getting their initial field exposure through emergency medical services (EMS) ride-alongs, to medical directors in large systems with high-incident volume and a large staff where the medical director may be an integral part of administrative and field operations on a daily basis.

Role and Purpose of the Medical Director

The American College of Emergency Physicians (ACEP) highlighted the medical director as an integral component of the EMS agency, stating that the medical director should have ultimate authority over all clinical and patient care aspects of the EMS agency, with the specific job description dictated by local needs, including the authorization to "limit immediately the patient care activities of those who deviate from established standards or do not meet training standards."[15] EMS medical direction involves granting authorities to act and accepting responsibility for the delivery of EMS patient care. Medical direction is narrower than oversight in that it defines what treatments EMS providers render when presented with medical conditions. Medical oversight ensures that the care is rendered by competent medical professionals, consistent with accepted standards. Medical oversight and direction are essential to all EMS systems as they help to ensure the appropriate delivery of emergency medical care to those with medical needs. The Federal Interagency Committee on EMS (FICEMS), as well as the National Association of Emergency Medical Technicians (NAEMT), stressed the importance of medical oversight in every EMS system; equally important in day-to-day EMS operations as during catastrophic events.

Across the United States, EMS providers obtain certification or licensure through a department or office located within their State government structure. However, in many States, this certification or licensure does not give permission for the EMS provider to function without being under the supervision of a licensed EMS agency and medical director. The medical director is responsible to ensure the patient care activities performed by EMS providers are appropriate, within their scope of practice, and within operational expectations. While advanced life support (ALS) agencies must have a medical director for paramedics to perform advanced therapies and patient care interventions, there is variability among State requirements for a medical director to oversee the basic life support (BLS) providers in an agency. Medical directors need to check with their State EMS office to determine what requirements are specified.

EMS providers function under the supervision of a medical director for patient care-related activities and the providers are dually accountable to their agency's hierarchical structure. It is critical that the medical director work collaboratively with the agency's leaders to ensure the EMS program administrative, operational, and clinical components are cohesive and complementary. The medical director and EMS agency's leadership must forge a positive, constructive, and collaborative relationship to enable the agency to be an effective and productive organization.

Scope of Responsibility

Agency Oversight

The medical director will be responsible for the general patient care-related activities of a particular agency. There are many facets of an EMS agency in which a medical director should be engaged in including educa-

tion and training activities, protocol and policy development, quality improvement activities, liaison, and corrective actions related to patient care actions by providers. Ideally, the medical director should have a strong familiarity with all the EMS providers within their agency. Additional and specific agency level activities will be discussed in further detail in subsequent chapters of this handbook.

Education and Training of the Medical Director

A medical director's specific qualifications, responsibilities, and authority differ across States and among individual EMS agencies. There are several consensus standard agencies and professional associations that have identified the professional education and training requirements for the medical director position.

Postgraduate Education

Physicians who complete a residency in emergency medicine are exposed to the fundamentals of EMS systems as part of their core education. For well over a decade, fellowships in EMS have been available to interested residency graduates who have a special interest in out-of-hospital patient care.

In September 2010, the American Board of Emergency Medicine (ABEM) announced the creation of an EMS subspecialty for physicians. This announcement followed years of focused efforts by EMS stakeholders such as the National Association of EMS Physicians (NAEMSP), ACEP, ABEM, and the Society for Academic Emergency Medicine. ABEM expects to begin the examination process in 2013. For eligibility requirements and additional information, the following website can be accessed: www.abem.org/PUBLIC/portal/alias_Rainbow/lang_en-US/tabID_4128/DesktopDefault.aspx

With the advent of the EMS subspecialty, EMS fellowship training programs will become fully accredited by the Accreditation Council for Graduate Medical Education (ACGME). Additional fellowship information can be accessed at the ABEM website specified above or at the NAEMSP website: www.naemsp.org/fellowshipprograms.html

State Requirements

A physician seeking endorsement as an EMS medical director must hold a current, unrestricted license to practice medicine or osteopathy issued by their State's Board of Medicine. States typically require a physician to complete a medical director training course. Many States have developed their own training course and many accept completion of a nationally recognized course.

Initial medical director training may be available at the local, regional, and State level. Many medical directors will elect to attend an initial training course at national conferences such as NAEMSP's offerings. In addition to attending an onsite class, there are online courses, such as the Critical Illness and Trauma Foundation (CITF) offering. CITF offers an online medical director training course which is based on National Highway Traffic Safety Administration (NHTSA), ACEP, and the NAEMSP guidelines for preparing medical directors. States may enter into a contract with CITF to support this training for that State's agency medical directors. If a particular State does not have a contractual agreement with CITF, individual physicians can register for the course for a fee. The CITF online course can be accessed by the following link: www.medicaldirectoronline.org

In many States, if the physician is Board Certified in Emergency Medicine (by the ABEM or the American Board of Osteopathic Emergency Medicine (AOBEM)), there may only be a requirement to complete the State's medical director training program. If the medical director is not Board Certified in Emergency Medicine, then many States require current certification in Advanced Cardiac Life Support (ACLS), Advanced Trauma Life Support (ATLS), and Pediatric Advanced Life Support (PALS) in addition to the successful completion of the State's medical director training course. However, there are variations in what States require

for their initial medical director training, as well as the continuing education requirements. Physicians should contact their State EMS office for assistance in locating class offerings. Specific requirements for your State may also be found by following the link below to your State EMS agency: www.nesemso.org/About/StateEMSAgencies/StateEMSagencyListing.asp

Consensus Standards and Professional Associations

Numerous consensus positions or standards can be found addressing the initial and continuing education of a medical director. Though many medical directors are not Board Certified in Emergency Medicine, ACEP, NAEMSP, National Association of State EMS Officials (NASEMSO), and some States encourage the medical director to be Board Certified in Emergency Medicine. All of these organizations have position descriptions, educational materials, and other supporting materials that can be accessed on their websites which aid in the education of a prospective, new, or incumbent medical director. Links to these organizations are

ACEP: www.acep.org

NAEMSP: www.naemsp.org

NASEMSO: www.nasemso.org

An Institute of Medicine (IOM) report titled "Emergency Medical Services at the Crossroads" released in June 2006 highlighted the need for stronger leadership within the EMS agency in order to make it more effective. EMS fellowship opportunities exist to help prepare interested physicians with the knowledge and leadership skills that are needed to become an effective medical director.

In general, the various EMS industry standards and guidelines contain commonalities when identifying qualifications for a medical director. These qualifications and skills can be summarized as:

- licensed to practice medicine or osteopathy (M.D. or D.O.);
- Board Certified or Board-prepared in Emergency Medicine (not required in many circumstances, but preferred);
- clinically active in emergency medicine;
- understanding of the design and operation of EMS agencies;
- familiar with local/regional EMS activity;
- familiar with administrative and legislative process that impact EMS;
- familiar with the scope of EMS skills (BLS and ALS) and communications systems;
- understanding of emergency medical dispatch (EMD) principles and processes;
- familiar with providing online and offline medical direction activities;
- involvement with training of EMS providers;
- involvement with quality improvement activities in all aspects of EMS delivery; and
- knowledge of local, regional, and State mass casualty and disaster plans.

Agency Training

Once the physician assumes the medical director role for the EMS agency, the agency needs to provide support and specific training for the new medical director. The agency should provide an orientation so the new medical director can be introduced to all personnel and understand the organization's structure and operations. The orientation should include a tour of all facilities and orientation to apparatus and equipment typically used.

If the medical director is expected to operate any of the agency's vehicles, then the agency needs to ensure the medical director receives Emergency Vehicle Operator Course (EVOC) training or equivalent courses approved by the agency's State EMS office.

As required by Occupational Safety and Health Administration (OSHA) (29 CFR Part 1910.1030), the medical director will also need agency provided infection control training prior to performing any field exposures or ride-alongs with agency personnel.

If the agency provides any specialized response components such as those discussed in the previous chapter, there may be additional and specialized training the medical director needs to obtain.

The agency needs to provide copies of, and educate the medical director on existing standard operating procedures (SOPs), training curriculums, and protocols.

Continuing Education for the Medical Director

The continuing education requirement for a medical director will also vary from State to State. Some States will require an annual or biannual update for medical directors to ensure their knowledge base is maintained regarding State regulations and to discuss emerging industry trends or hot topics. If not specifically required by the State, many EMS agencies will prefer if their medical director is not Board Certified in Emergency Medicine, that they maintain specific certifications such as ACLS, ATLS, PALS, as well as satisfying the educational requirements for the physician's primary board certification.

In addition to the NAEMSP (whose annual conference is dedicated to topics related to EMS medical directors), there are numerous professional organizations with EMS sections that sponsor national conferences. These offer continuing education relevant to a medical director's role. These events not only provide needed continuing education credits, they expose the medical director to networking opportunities with other medical directors and industry professionals.

Regardless of State regulation or agency requirement, a dedicated medical director will pursue ongoing educational activities, exposure to the out-of-hospital environment, and contact with providers they oversee.

Affiliation Agreements

When a physician decides to act as a medical director, a written agreement with the agency is needed and may be required by State rules or statues. This written agreement needs to provide a position description, the expected tasks, performance criteria, agreed upon compensation, provided resources, liability coverage, and the process for dispute resolution.

Agency, municipal, and State regulations will assist in defining the medical director role and authority. The medical director's scope of responsibility and authority must be clearly delineated in the position description and written agreement with both the agency and medical director educated on all topics within the agreement.

The form of affiliation agreement can vary from agency to agency. The medical director must understand the ramifications of the written agreement and the advantages and/or disadvantages of the form of the relationship. For example, if the medical director becomes an employee of the agency, there may be perceived advantages such as benefit coverage (e.g., insurance, etc.) or automatic tax-related deductions that may not be included in a contract form of agreement. However, there may also be perceived disadvantages by having the medical director in an employee status that is accountable to an agency supervisor or potential restrictions on lobbying activities that may not be present in a memorandum of agreement (MOA).

The medical director must carefully assess all factors when considering and negotiating the type and content of the agreement. Regardless of the type of agreement, a part of any negotiation is the need for the agency to support the medical director. The agency should provide support to the medical director in the form of resources and training. Examples include administrative support, providing training for agency-specific requirements, access to facilities and personnel, financial support for conference attendance, or other continuing education needs.

To fully understand the differences between the forms of affiliation agreements, the medical director should seek independent legal and tax professional consultation prior to entering into any agreement to ensure adequate protection and that expectations are clearly defined. This action should be taken regardless of if the position is uncompensated or compensated in nature. Employed physicians also need to discuss these relationships with their employer, as there may be both contract and liability issues. The handbook contains a sample affiliation agreement in the appendix.

Hire/Employee

In some cases, the medical director will be a competitively hired or appointed position within the agency. With this type of arrangement, the position of the medical director becomes an employee of the agency which may be either an appointed, part-time or full-time position dependent on the size, complexity, scope, and needs of the agency.

Independent Contractor

Agencies may advertise a request for proposal or invitation to bid where they will contract for medical direction services with the selected party. Simply stated, a contract is a legally binding agreement between the parties and the agreement is governed by contract law. There are general requirements typically found in contracts which include the contract purpose, the legal issues associated with the contract, identification of the parties represented by the contract, an offer and acceptance to perform the requested services, what resources are agreed upon, responsibilities, penalties, and the process to terminate the contract. Contracts can cover either uncompensated or compensated relationships.

Memorandum of Understanding and Memorandum of Agreements

Agencies may also enter into a memorandum of understanding (MOU) or an MOA with the medical director and may also address uncompensated or compensated arrangements.

MOUs typically define and clarify the relationship between two parties. One major difference between a contract and an MOU is that the MOU is usually not entirely binding on the parties. Medical directors may feel uncomfortable with this type of agreement, especially in the areas of potential legal representation and liability coverage.

Similarly, an MOA is a promise between parties to cooperatively work together on an agreed upon project. The MOA can establish the expectations of how the parties will pursue a positive, cooperative effort. There is typically a list of terms that may be binding on how the parties will work cohesively together within the terms of the agreement. Once again, medical directors may believe an MOA will not be comprehensive enough if a legal issue was to arise during the course of the relationship.

Performance Expectations

While the medical director's position description will identify the duties and responsibilities, it does not identify how the medical director will perform them. Performance expectations are the measurement tool for understanding if the duties and responsibilities are being met. The EMS agency's administration should clearly communicate the medical director's performance expectations. It is critical for both the agency and the medical director to understand and ensure that a balance is achieved between the performance expectations and time commitments.

Performance expectations are to be specific, measurable, realistically achievable, results-or outcomes-oriented, and have associated time lines where appropriate. This information is often included in the position's job description, contract, MOU, or MOA content. Examples of how a medical director's identified responsibility can be further defined by performance expectations are as follows:

Example 1:

Responsibility: The medical director shall serve on local, regional, and national committees and/or boards as mutually agreed upon by the agency's leadership and the medical director.

Performance Expectations

1. The medical director shall attend a minimum of 75 percent of local EMS committee meetings. Meetings will be held the second Thursday of each month unless otherwise specified.
2. The medical director will chair the Continuous Quality Improvement Committee. Meetings are to be held quarterly.
3. The medical director shall attend a minimum of 50 percent of regional EMS council meetings.

Example 2:

Responsibility: The agency agrees to provide needed resources and benefits to the medical director as mutually agreed upon by the agency's leadership and the medical director.

Performance Expectations

1. The agency will provide up to three periodical subscriptions as identified by the medical director directly related to the medical director's position and responsibilities.
2. The agency will provide financial support for the medical director to attend one regional, State, or national level conference on an annual basis. Costs of financial support will not exceed $1,500 per annual occurrence.
3. The agency will provide two work uniforms and one set of personal protective gear to be worn during emergency incident responses or field-related activities.
4. The agency will provide administrative support for correspondence proofreading and formatting, copying of documents, and filing support for materials directly related to the medical director's position and responsibilities.

5. If onscene medical director support is requested, the agency will provide a driver and arrange for pick up or rendezvous point with the medical director to be transported to the scene in an official vehicle.

Compensation and Benefits

Dependent on the size and scope of the EMS agency with whom the medical director will be involved, the agreement to serve as a medical director may or may not include compensation and/or benefits. The EMS agency has an obligation to support the medical director and provide the appropriate resources in the form of agreed upon compensation (hourly or salaried), materials and personnel assets (costs associated with uniform, equipment, travel, continuing education, or professional organization memberships, etc.), and liability protections. However, an EMS agency's resources will vary depending on locale, and many will require charitable contribution of the medical director's time and expertise. It is critical that an EMS medical director ensure personal protection for both liability and injury, despite the lack of resources available to the EMS agency.

Workers' Compensation

Each State identifies and controls the workers' compensation insurance policies. This coverage is mandatory for employers and covers their employees for any injuries they incur in the course and scope of their employment.

If a medical director has an employee/employer relationship with their agency, workers' compensation may be a recognized benefit afforded to the medical director. However, if the medical director has a contractual MOU or MOA for their services, workers' compensation coverage is almost never included.

Dependent upon the situation and service agreement, an EMS agency may require the medical director to obtain their own workers' compensation insurance for the medical director and any other staff that the medical director may employ. The agency may also require proof of such coverage or proof that workers' compensation is not required by law. Agencies may also require the medical director to indemnify and hold the agency harmless from any and all claims for these obligations.

Medical directors need to check with their agency's leadership for specific workers' compensation requirements and understand how the relationship may be impacted by the form of agreed upon affiliation agreement.

Continuing Education

If an EMS agency requires their medical director to maintain specific certifications or perform certain continuing education activities, the agency may bear some of the obligation to support the medical director in the activity. For example, if the agency requires the medical director to perform field work, then the specific initial and ongoing training to properly prepare the medical director (e.g., infection control, emergency vehicle operator course, communication device use) should be provided by the agency.

The expectation for this arrangement must be clearly stated in the job description, contract, MOU, or MOA. Often, professional journal subscriptions or conference attendance are a negotiated benefit.

IRS Requirements

Unless the medical director is an employee of the agency, the medical director will be individually responsible for all Federal and State taxes. This responsibility will include Social Security, Medicare taxes, and self-employment-related taxes and obligations including Federal and State income tax withholding, Social Security contributions, and similar obligations related to the medical director's independent contract, MOU,

or MOA. As with the workers' compensation issue, the agency may require the medical director to indemnify and hold the agency harmless from any and all claims for these obligations.

The medical director should consult an independent tax professional for further review and guidance.

Dissolution

When the relationship between the medical director and the EMS agency is no longer going to continue, a dissolution or termination of the service agreement needs to occur.

Typically, any form of agreement to serve should contain language of how the agreement would be terminated. A critical component in this area would be the timing of the intent to terminate notification on either party's behalf. Typically, agencies will require a minimum of 90-days notice so that a replacement medical director can be obtained without experiencing a disruption in service delivery. Other critical components for a medical director to consider with this issue is how property owned by the agency is returned, how compensation is adjusted or reconciled, and how liability protection is addressed for any future cases that develop, which relate back to the time covered by the medical director's activity.

Liability Coverage

Although many physicians have malpractice insurance coverage that may extend to some of the activities of medical director, they are unlikely to have coverage for all potential liabilities associated with the medical director position, role, and responsibilities. In fact, the medical director's typical professional liability coverage may have coverage gaps related to the associated EMS activities being performed.

The medical director must have a clear understanding of who, what, and when their activities are covered by the agency's liability policies. Just as important to knowing what activities are included in the liability coverage, the medical director must know what activities may be excluded from the coverage. In addition to medical malpractice coverage, medical directors need to carry errors and omission insurance, and be covered under the general liability policy of their agency. If the medical director is considered to be serving in a leadership role of the agency, then director's and officer's insurance coverage may also be needed.

Obtaining adequate liability coverage as a medical director can be challenging. Resources to obtain adequate coverage include the agency's insurance carrier, a rider to your clinical practice's insurance carrier, an independent insurance broker who deals in "unique" coverage circumstances (large, national/international broker), and insurance available through professional organizations. Medical directors should seek independent consultation with an attorney familiar with liability issues for additional guidance related to requirements for adequate coverage. This action should be taken regardless of if the position is uncompensated or compensated in nature.

It is recommended that a medical director establish a working relationship with the agency's risk management section. Medical directors must have a thorough understanding to ensure they have comprehensive liability protection either through the agency's self-insurance, indemnification, and/or separate insurance policy coverage. It cannot be stressed enough that the standard liability protection possessed by all practicing physicians will be inadequate to cover a physician for medical direction activities. In the appendix, there is a sample liability insurance form.

Medical Malpractice Coverage

Medical malpractice is an act of commission or omission by a health-care provider when their care deviates from accepted practice standards which results in a patient's injury or death. The professional liability policy must include medical malpractice coverage which is designed to cover risk and liabilities that occur in the field setting where patient care has been provided.

Errors and Omission Coverage

In general, errors and omission insurance helps provide coverage for defense costs and damage awards that may be associated with professional liability claims. Errors and omission coverage must cover the risk associated with any nonpatient care activities (e.g., oversight and training exposures) the medical director engages in. Errors and omission insurance typically does not provide coverage for intentional, fraudulent, or illegal activities, and many policies will not cover punitive damages.

General Liability Coverage

EMS agencies generally have a commercial general liability policy (in some States, this is a requirement to become licensed). A medical director requires some coverage that is found in general liability policies. If the medical director uses equipment or a vehicle owned by the EMS agency, the medical director must assume there could be risk associated with that equipment or vehicle. Usually, the owner would be liable for damages caused by the equipment, but additional coverage specifically for the medical director to use non-owned equipment or vehicles should be considered.

Issues related to employment practices are another large area of general liability exposure for the medical director. The EMS agency should consider obtaining Employment Practices Liability (EPL) coverage for these types of claims, and if the medical director is involved in employment-related activities or decision-making, the medical director could be included in this coverage.

Directors' and Officers' Coverage

Director and Officer insurance provides coverage against legal defense costs and indemnity for the agency, directors and officers, as well as personnel in legal claims that assert internal mismanagement or performance of wrongful acts while acting in director or officer capacity for the agency.

Indemnification

Medical directors need to require their EMS agency to include indemnification of the medical director in their service agreement. Indemnification simply means that the EMS agency will agree to assume the financial responsibility associated with defending the claim or lawsuit and will be responsible for monetary awards if an individual prevails in a lawsuit related to the performance of duties by the medical director. If there is not an indemnification clause in the agreement, the medical director could be held personally liable for the financial damages awarded in a prevailing lawsuit (subject, of course, to any applicable insurance coverage that might be in place).

Areas of Caution for Medical Directors

The medical director is recognized as a leader of an EMS agency, but the position is not the only leadership position in the agency. While the medical director is responsible for overseeing the clinical patient care components of the EMS agency, they must work in concert with the agency's administrative and operational leaders.

As with any position of organizational leadership, a medical director is expected to comply with accepted professional, moral, and ethical activities. The medical director must ensure their actions are performed in accordance with standard workplace practices and are carried out in a nondiscriminatory manner.

There are a few areas when the lines between clinical, administrative, and operational practice become blurred and seem to carry over into the different realms. As previously mentioned, the medical director supervises the EMS providers' medical practice. The medical director may withdraw their supervision of an EMS provider if the provider's performances of procedures or medical interventions are questioned. The provider's employer is generally responsible for the hiring, promoting, terminating, or other employment actions.

When faced with these situations, the agency's leaders must work closely together to ensure fair and equitable actions are taken without infringing on an individual's rights or taking action which may be deemed beyond the leader's scope of authority. Discussed below are some of the general areas that a medical director's scope of authority may be limited and direct involvement within should be approached with caution.

Hiring and Promotional Decisions

Depending on the agency, the medical director's involvement with hiring and advancement opportunities of the personnel may be limited. The EMS agency may request the medical director's involvement in the development of the criteria such as medical qualifications and credentialing, but the medical director should not participate in the actual hiring or promotion decision. Agencies may request the medical director review applications or resume information as it pertains to medical knowledge or credentialing, but actual decisions to hire or promote individuals will not likely be a decision that directly involves the medical director. However, if the medical director also functions as a managing partner of the agency (e.g., private- or hospital-based agency), the involvement in hiring and promotional decisions may more directly involve the medical director due to their dual agency role.

Provider Disciplinary Actions

The medical director is responsible for the clinical application of patient care policies, procedures, and protocols. When there are situations where individuals may not have performed as expected, the medical director may be involved in determining the circumstances and identifying appropriate remedial actions, but may not be further involved in decisions if disciplinary actions will take place. Often, such determinations and remediation involve collaborative investigations with administrative leaders in the EMS agency. There may be workplace regulations, identified in Federal, State, or local regulations that describe how the investigation is performed, including requirements for specific steps and notifications. The medical director should be knowledgeable of these due process requirements prior to the initiation of any investigative process.

There may be occurrences where the medical director may limit or revoke a member's privileges to provide patient care. Any further decisions related to the continued affiliation of the individual with the agency based on the provider's restriction from patient care environment are the responsibility of the agency's administration and/or State or local regulation. The medical director must recognize that agency-level disciplinary actions related to the direct employer-employee relationship are separate and the medical director should not become involved in those specific deliberations. As previously stated, if the medical director has a dual management role in the agency, there may be more participation in disciplinary issues beyond what is generally described above.

Budget and Procurement Regulations

Budget and procurement activities can be highly structured and governed by regulatory requirements. While the medical director may provide input and recommendations specific to patient care initiatives, the final decision, and regulatory compliance should be carried out by the agency's administrative and operational leaders.

The medical director may become engaged in advocating for budgetary needs with the appointed and political leaders associated with the EMS agency.

Conflict of Interest Considerations

A medical director is bound to maintain the highest ethical standards in the performance of their duties at all times. One of the areas where ethical issues can arise involves conflict of interests. The medical director should always maintain an awareness of potential professional, political, or financial conflicts of interest

that may arise. In the event that a conflict of interest exists, it is crucial to ensure that your agency is made aware of this in writing. As a contractor, the medical director cannot be compelled to participate in a decision or action that they believe to be a conflict of interest.

Potential conflicts of interest include

- conflict between two separate EMS agencies, both of whom employ the same medical director;
- financial conflicts of interest if the medical director, or immediate family members, have stock, corporate holdings, royalty arrangements, etc., with products or services that might be used by the EMS agency;
- personal relationships with personnel for whom you oversee;
- conflict between the EMS agency and the hospital where the medical director is employed either directly or indirectly; and
- nepotism situations or concerns.

Steps for conflict resolution:

1. Disclose conflict to all parties.
2. Attempt to remediate the conflict of interest. Options may include
   a. If there is an assistant medical director, assign the decisionmaking activity to the assistant and do not interfere during the process.
   b. Address the issue based on the role the medical director is responsible to function in at that time.
   c. Most municipalities will have a conflict of interest policy which the medical director must comply with. If the agency lacks a formal policy, the medical director should reference the local or State policy.

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Agency Oversight

Workforce Oversight and Supervision

One of the most important functions the medical director can perform is to have frequent quality interaction with the agency's emergency medical services (EMS) providers. EMS providers need to have ongoing interactions with the medical director, including education and mentoring, to ensure agency efficiency and provider effectiveness is optimized. These interactions allow the medical director to identify strengths that may take the organization in positive directions, and weaknesses that need to be remediated before they affect a patient. As previously mentioned, the medical director needs to make every reasonable effort to know all of their providers. In larger agencies, the medical director may also use the agency's chain of command to assist with the ongoing monitoring of all EMS providers.

A medical director should provide essential:

- medical leadership;
- agency medical oversight;
- medical-related education and training, both initial, continuing, and refresher education;
- coordination of medical-related standard operating procedures (SOPs) and protocols;
- medical-related emergency preparedness and disaster care;
- implementation of medical-related best practices;
- medical-related quality improvement;
- provider health and safety measures; and
- research activities related to efficiency and efficacy of out-of-hospital patient care practices and patient outcomes.

According to the Institute of Medicine (IOM), some of the greatest challenges for the medical director related to EMS are

- Workforce shortages—Insufficient staffing of EMS resources due to inadequate compensation or difficult working conditions. Common EMS industry working conditions which can be classified as difficult are high-call volumes and long work hours.
- Lack of nationwide training requirements which cause wide variation in the quality of care—Stringent requirements related to training, certification, and licensing issues may impact EMS providers' ability to work in different regions, neighboring jurisdictions, or States.
- Occupational hazards that include infectious and contagious diseases, violence, and vehicle crashes—EMS activities are frequently performed in uncontrolled and unpredictable environments.

- Risk of terrorist incidents and lack of disaster preparedness—EMS providers are often first on the scene of all-hazard incidents including natural and manmade disasters. EMS providers are susceptible to dangers that other members of the health-care community may not be typically exposed to.
- The ability to care for pediatric patients—EMS providers respond to medical and traumatic incidents involving pediatric patients. Specialized training is required to adequately care for this subset of patients. Some EMS providers may have limited exposure to the pediatric population and some may not be as comfortable caring for pediatric patients as they are with the adult patients they routinely care for.
- Overcrowding of emergency departments—Emergency department overcrowding affects EMS agencies. Overcrowding can lead to long wait times for EMS resources to transfer care of their patients to the receiving hospital. Overcrowding may result in ambulances being diverted to other hospitals. Diversions from facilities with specialty services, such as a Level One Trauma Center, to a facility with lesser capabilities, can be detrimental to patient outcomes. Extended wait times can affect the operational capacity of the EMS system and cause resource availability shortages.

In addition to the challenges identified above, medical directors may also find that geriatric patients present specific challenges for an EMS agency. The geriatric patient population is one of the fastest growing subsets of patients and represents a disproportional incident volume when compared to any other age demographic set. Medical directors should ensure EMS providers receive initial and continuing education training in the emergency care of geriatrics.

Provisions of Patient Care

Protocols

Protocols help define the scope of out-of-hospital care for an EMS agency and prescribe recommended approaches for the provider to managing particular patient care situations.[16] In general, EMS providers must closely adhere to the protocols unless otherwise advised by online medical direction or clearly indicated by specific patient condition and reaction to usually employed therapies.[17] If online medical direction provides specific orders, the EMS provider must ensure to only perform those patient care treatments identified and approved within their level of certification or licensure.

In some systems, protocols may be developed and/or mandated by State or regional oversight entities. In these situations, protocol modifications by the local EMS agency's medical director may or may not be permitted. Systems may use locally developed protocols which can be created solely by the medical director or in collaboration with a crossfunctional committee within the agency and/or local medical community. In most cases, an agency's new medical director will choose to revise existing protocols rather than introducing a completely new protocol set. This approach may prove advantageous when limited advances in patient care standards are needed. All protocols deserve regular review and updates to reflect evidence-based changes in patient standard of care.

Standing Orders

Standing orders are more specific and are usually included within a protocol when a delay in treatment could be detrimental to the patient's medical condition.

Examples of standing orders for a paramedic may include

- defibrillation of a patient in ventricular fibrillation;
- advanced airway placement in an apneic patient; and
- medication administration for a cardiac arrest patient.

Protocols and standing orders should be evidence-based and be heavily guided by current peer-reviewed medical literature when available, evidence-based national standards, and State and regional patient care guidelines.[18] Often, these clinical directives must be carefully integrated into EMS industry operational practices themselves, subject to change based upon clinical advances.

Online Medical Direction

Online medical direction is the management of patient care by physicians through contact with the EMS providers by radio, phone, or other communication devices. EMS providers may seek online medical direction consultation to obtain orders, perform a procedure, or administer a drug that requires online approval. This communication allows for direct consultation on specific or unusual patient care situations and prepares the receiving facility for the incoming patient. This type of verbal communication may not always be given by the agency's medical director but by a physician at a designated medical facility.

Offline Medical Direction

Offline medical direction involves the development, dissemination, and enforcement of written instruction. Through offline medical direction, the EMS provider acts as an agent of the medical director.[19] Offline medical direction includes the administrative promulgation and enforcement of accepted standards for out-of-hospital care, including protocols and standing orders.

Offline medical direction can be accomplished through both prospective and retrospective methods. Prospective methods include, but are not limited to, training, provider testing and certification, protocol development, operational policy and procedures development, and legislative activities. Retrospective activities include, but are not limited to, medical audit and review of care, process improvement, direction of remedial education, and limitation of patient care functions.

Medical directors should actively participate in the agency's administration, education, quality improvement activities, and research endeavors that are critical to the success of the EMS agency. Committees with medical and provider representatives functioning under the medical director supervision can assist the medical director in performing various prospective and retrospective activities.

Medical Director in the Field

Medical directors should routinely participate in field responses, making first-hand contemporaneous patient care evaluations of the EMS system. This may take the form of ride-along experiences with EMS personnel to gain field experience, or may involve an individual response or response with an officer or other EMS entity within the agency. This activity will help evaluate the agency's effectiveness and the quality of service being rendered to ill and injured patients. The medical director's onscene observations and guidance on routine EMS responses will support a factual assessment of many aspects of service delivery, provide mentoring and coaching opportunities of EMS providers, and have the added benefit of demonstrating commitment to the EMS providers and agency leadership. Field exposure will also benefit the medical director in establishing initiatives that will advance their agency's performance, as well as provide evidence-based research opportunities in a clinical EMS setting. Although direct field experience with providers may be time-intensive, it is one of the most valuable experiences for both medical directors and providers.

In some EMS agencies, the experienced and properly trained medical director not only observes, but also actively participates in out-of-hospital patient care on a regular basis. Often, these medical directors were themselves certified EMS providers prior to medical school. Indeed, the premise of the American Board of Medical Specialties' (ABMS') establishment of EMS as a medical subspecialty for physicians is that they will physically provide hands-on out-of-hospital patient care.

Medical directors need to have proper identification (e.g., agency identification cards, uniforms, etc.) and appropriate personal protective equipment (PPE) when participating in field operations.

Incident Command System

Whenever a medical director is participating with field operations, it is imperative that the Incident Command System (ICS) is understood and followed. This helps the medical director contribute to the management of the incident and not become a liability at the incident. The ICS is a standardized approach to manage emergency incidents and major events. The ICS is flexible and has a top-down organizational structure which begins when the first responder on the scene becomes the first Incident Commander (IC). The organizational structure can be expanded or contracted as necessary to accommodate the size of the incident.

When the medical director arrives on an emergency scene, they must immediately report to the Command Post for guidance, direction, and integration into the ICS, unless specifically directed to report to another area (e.g., Medical Branch or Staging) during their response to the incident scene. Properly trained medical directors can be of great value on the scene when they are fully integrated into the ICS.

Within the Incident Command structure, one of the possible medical functions is a Medical Branch. On-scene physicians often function as part of the Medical Branch or as a technical advisor to the IC. As resources arrive on the emergency scene, they are assigned to work in functional groups or geographic divisions and will report up the assigned chain of command.

The three functions in the Medical Branch are Triage, Treatment, and Transport. Triage is the rapid assessment and sorting of patients. There are several models that are widely accepted within the EMS industry. One model is the Centers for Disease Control and Prevention (CDC) Sort, Assess, Life-Saving Interventions, Treatment and/or Transport (SALT) triage method. SALT incorporates elements of other standardized methods of disaster triage. Another popular triage tool is the Simple Triage and Rapid Transport (START) model. The START triage model sorts patients into four color-coded categories:

Red (Immediate): Those with life threatening but treatable injuries who can be helped by immediate transportation.

Yellow (Delayed): Those with serious injuries but condition is stable enough for to have their transport delayed.

Green (Minimum): Those with minor injuries that can wait a longer time to be transported and need help less urgently.

Black (Deceased): Those who have injuries incompatible with life, or there is a lack of spontaneous respirations after the airway is opened.

Additional information regarding triage systems comparisons can be found at: www.dmphp.org/cgi/content/full/2/Supplement_1/S25

The Treatment Group is responsible for establishing the area to treat the patients that have been triaged. The treatment area will also be segregated by red, yellow, and green areas. EMS resources and equipment will be assigned to the various areas within the treatment area to initiate patient care and prepare patients for subsequent transport to medical facilities.

The Transportation Group coordinates the movement of patients from the treatment area to the receiving facilities.

EMS Scope of Practice

The "National EMS Scope of Practice Model (Scope of Practice)" divides the "National EMS Core Content" into four established provider levels, each with minimum skill and knowledge standards. As State EMS agencies begin to adopt the "National EMS Scope of Practice Model," it should be noted that the medical director may encounter providers using older terminology related to older scopes of practice levels.

- Emergency Medical Responder (EMR)—formerly known as First Responder;
- Emergency Medical Technician (EMT)--formerly known as EMT-Basic;
- Advanced Emergency Medical Technician (AEMT)--formerly known as EMT-Intermediate; and
- Paramedic—This term has remained the same.

The following descriptions are summaries from the "Scope of Practice" for the four established provider levels:

Emergency Medical Responder

The EMR possesses the basic knowledge and skills necessary to provide lifesaving interventions while awaiting arrival of additional EMS response resources. EMRs may assist higher-level certified EMS personnel at the scene and during patient transport. EMRs perform basic interventions such as basic patient assessment, oxygen administration, splinting, bandaging, and spinal immobilization with minimal equipment.

Emergency Medical Technician

The EMT possesses the basic knowledge and skills necessary to provided patient care and transportation. EMTs perform interventions with the basic equipment typically found on an ambulance. The EMT incorporates the skills of the EMR level but will have additional training related to patient assessment skills, gaining access to patients in various situations, ambulance operations, and will have clinical experience during their education program. In some States, the EMT may administer or assist with the administration of certain medications, use emergent airway adjuncts, and monitor existing intravenous fluid administration.

Advanced Emergency Medical Technician

The AEMT possesses all the knowledge and skills of the EMT. AEMTs can perform further skills such as intravenous or intraosseous fluid administration, certain advanced airway adjuncts, specific emergency care medications, and will have a greater depth and breadth of clinical procedure education as it relates to human anatomy and physiology.

Paramedic

The paramedic possesses the complex knowledge and skills necessary to provide advanced levels of patient care and transportation. The paramedic curriculum incorporates the EMR, EMT, and AEMT knowledge and skills, but also has additional hours of didactic and clinical requirements. The hourly requirements vary between States and programs, but paramedics usually have, at a minimum, approximately 1,000 additional educational hours above that of an EMT. The paramedic can be expected to perform advanced procedures such as endotracheal intubation, intravenous and intraosseous fluid administration, surgical airway techniques, medication administration related to several conditions, cardiac rhythm interpretation including 12-lead electrocardiograms (ECGs), defibrillation, and synchronized cardioversion, as well as other advanced procedures approved by the medical director.

Each educational level assumes mastery of previously stated competencies. Providers must demonstrate each competency within their scope of practice and for patients of all ages.[20] For a more detailed explanation related to the different EMS Scope of Practice for each can be found at EMS.gov at the following link: www.nhtsa.gov/people/injury/ems/EMSScope.pdf

The "Scope of Practice" determines what procedures a certified or licensed EMS provider is authorized to perform. This standard approach to identify provider levels supports the ability for States to uniformly recognize the certification or licensure levels, has the potential to resolve reciprocity issues between the States, and may assist in facilitating EMS provider mobility. However, at this time, the adoption of the "National EMS Scope of Practice Model" is not uniformly accepted by all States.

As previously mentioned, in States where the "Scope of Practice" is not accepted, there may be other governmental levels (State, regional, or locality) that establish and define the scope of practice for EMS providers. Adding to this variability is the issue that not all States use the National Registry of Emergency Medical Technicians (NREMT) certification exams, instead opting to develop their own testing for one or all of their certification or licensure levels. In these situations, a wide variety of provider titles and scope of practice definitions can exist. The medical director should become familiar with the current standards within their State. Additionally, it is crucial for the medical director to have knowledge of the EMS provider levels and associated skill sets within their agency.

Education Standards

National EMS Educational Standards

Often one of the medical director's responsibilities is the oversight of the EMS agency's educational programs. These educational programs may range from initial education of new providers, to the continuing education programs for incumbent providers within your agency. National Highway Traffic Safety Administration (NHTSA) has developed new "National EMS Educational Standards" according to each provider level. The medical director can view those standards and other related EMS issues (www.ems.gov).

The new "National EMS Educational Standards" will replace older EMS training curriculums and increase each provider-level standard for educational course development. The "National EMS Educational Standards" will be used as a basis for the development of new EMS textbooks by various publishers.

The basis for formulating the new "National EMS Educational Standards" originated from three published documents. The first document was titled the "Education Agenda," which had its roots in a document drafted in 1996 titled "The EMS Agenda for the Future." The "Education Agenda" called for a new and improved national EMS educational system that would work to increase efficiency and produce higher entry-level graduate competencies for EMS providers, as well as leading to national accreditation for EMS educational programs. The second document used to draft the new "National EMS Education Standards" comes from the "National EMS Core Content." This document lists all necessary course content to be provided in EMS education including patient conditions, chief complaints, operational issues, and provider psychomotor skills. The third document associated with this implementation of the new "National EMS Educational Standards" was the "National EMS Scope of Practice Model" published in 2005. This document identifies the four EMS personnel certification or licensure levels which were previously discussed in this chapter.

The "National EMS Educational Standards" define the competencies, clinical behaviors, and judgments that must be met by entry-level EMS personnel to meet practice guidelines defined in the "National EMS Scope of Practice Model."

The "National EMS Educational Standards" are made up of four components:

1. Competencies for each level of EMS provider (EMR, EMT, AEMT, and paramedic).
2. Knowledge required to achieve the competencies.
3. Clinical behaviors/judgments.
4. Educational infrastructure.

The "National EMS Educational Standards" provide a general framework to support individual programs for developing specific curricula to meet identified training and educational needs in particular regions. The format also allows for ongoing revision when research supports practice changes based on scientific evidence or when standards of care change. This approach is very different from previous approaches to curriculum development and revision which were infrequent and slowly implemented.

NHTSA has also published instructional guidelines for each provider certification level. These instructional guidelines include the basic information that programs must deliver in order for their students to meet the described competencies.

Medical directors are encouraged to engage with their State's EMS office to determine if these national standards will be adopted and identify associated implementation timelines.

Additionally, agencies providing certification courses will often need a physician course director. Each certification course will have its own set of defined physician oversight responsibilities and the medical director may want to also agree to serve in this capacity.

EMS Provider Continuing Education Program Development

The medical director needs to be involved in the development and approval of all agency-based continuing education initiatives to ensure the accuracy and validity of the courses' medical content. To address individual areas of concerns or agency trends, the medical director should incorporate findings from the agency's quality improvement initiatives into the continuing education program. There should be a seamless transition from the agency's quality improvement efforts to its education programs. Continuing education should be designed to meet three main objectives:

1. Provide exposure to current trends and evidence-based advances in patient care.
2. Review areas of patient assessment and management that are not frequently used.
3. Meet certification or licensure renewal requirements of the provider.

To ensure the developed continuing education program meets the providers' certification and/or licensing renewal criteria, agencies should have the course content verified by their State oversight agency or a nationally recognized entity. The Continuing Education Coordinating Board for Emergency Medical Services (CECBEMS) is a nationally recognized agency that will verify EMS continuing education course content. CECBEMS approved courses meet national standards and are generally accepted by NREMT.[23] Continuing education credits may also be obtained through other governmental agencies such as the Federal Emergency Management Agency (FEMA), if the course content is related to emergency response aspects. Medical directors should refer to their State EMS oversight agency for guidelines related to EMS continuing education programs and accepted credits.

In addition to their State certification or licensure, providers may also maintain certifications in various other training courses such as Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), International Trauma Life Support (ITLS), Prehospital Trauma Life Support (PHTLS), and Critical Care Emergency Medical Transport Program (CCEMTP). Medical directors may be requested to evaluate or support these courses as part of their provider credentialing process; therefore, the medical director will need to have a familiarization with training courses and their requirements.

Medical directors may need to work collaboratively with the agency's leadership on system design issues and assessments of provider certification levels to ensure requirements fit local needs and resources. These assessments will need to be periodically reviewed as the community's demographics may change or the EMS local environment becomes impacted by external forces. Examples of these situations may include single-level versus tiered system assessments or required transitions due to curriculum changes (e.g., discontinuation of NREMT—Intermediate level certification). Implementing system design changes will require modifications to provider initial and continuing education programs.

Provider Competency Verification

The medical director's role in oversight related to initial and continuing EMS education and competency is imperative to the success of the clinical application of out-of-hospital care by your agency. Of critical importance is the medical director's role in verifying all levels of providers' skill set competencies to ensure safe, efficient, and effective operational activities. Medical directors should have a direct role in the evaluation and refreshment of providers' skill sets. Competency assurance is verified by assessments of providers during the initial credentialing process and at periodic subsequent assessments. The assessments involve cognitive, psychomotor, and affective domains and are reflective of skills performed in the EMS profession. Low-frequency but high-criticality skills such as rapid sequence intubation, surgical airway procedures, and needle chest decompression are examples of procedures that will require frequent competency evaluations and educational support from the medical director to ensure providers remain ready to perform the skill in the out-of-hospital setting.

The task of competency verification can be accomplished in conjunction with your agency's training or operational staff. The medical director's oversight of competency-based evaluations may be identified in your agency's affiliation agreement, or may be a State or local EMS regulatory requirement.

Performance-Based Organizations

EMS is a multifaceted, integrated emergency response function that requires constant oversight. The medical director has the responsibility to assist their EMS agency with identifying improvements to patient care delivery processes, procedures, and equipment. By working cooperatively with agency leaders, supervisors, administrative specialists, and providers, the medical director can provide a team approach to manage the daily quality assessments of patient care-related activities to ensure that the EMS agency is operating effectively and providing the best prehospital care possible.

EMS agencies must be routinely evaluated for strengths, weaknesses, opportunities, and threats (SWOT) to have their policies and procedures revised to reflect best practices in the industry. The EMS agency's processes, equipment, and supplies should be routinely evaluated and considered for appropriate revisions and replacement to ensure EMS providers have the tools for performing their expected tasks.

Quality Improvement

A multitude of quality improvement (QI) activities have been performed by many EMS agencies through the history of EMS. In 1997, NHTSA produced a publication titled "A Leadership Guide to Quality Improve-

ment in Emergency Medical Services (Leadership Guide)." The "Leadership Guide" was based largely on the seven Malcolm Baldridge Quality Categories:

1. Leadership.
2. Information and Analysis.
3. Strategic Planning.
4. Human Resource Development and Management.
5. Process Management—Mapping.
6. Agency Results.
7. Stakeholder Satisfaction.

The "Leadership Guide" encouraged EMS leaders to integrate QI practices into daily EMS operations and organized performance measures into three developmental stages:

1. Building potential for success by developing an awareness for QI.
2. Expansion of QI knowledge, capabilities, and practices into agency workforce.
3. Full integration of QI strategies into daily EMS operations.[22]

The medical director must have the authority to develop medical policies and procedures as well as the power to limit the actions of personnel who deviate from established standards. The medical director must also ensure that agency's protocols, procedures, and policies are consistent with their State's minimum requirements, including those for certification and/or licensure.

As one of the leaders in an EMS agency, the medical director should have authority over the agency's patient care quality management activities. EMS managers, supervisors, educators, providers, and external healthcare community members must work together to accomplish quality management initiatives. The medical director needs to be involved in the development and monitoring of quality management related performance objectives in order to evaluate an agency's ability to meet its objectives. Quality management objectives can be developed from the following system components:

- communications;
- addressing complaints;
- documentation;
- reduction and prevention of illness and injury;
- patient confidentiality;
- performance objects;
- physician participation;
- public health outcome parameters; and
- participation in studies and research.[23,24]

Types of Quality Improvement

QI may be prospective, concurrent, or retrospective in nature. EMS providers and supervisors should be held accountable for the procedures that the medical director and agency leadership have put in place. EMS agencies should conduct their QI program using components of all of the types of QI mechanisms listed below. EMS providers and other end users need to be involved in the process. QI activities should not be designed to be punitive in nature for individual providers but instead be focused on organizational improvements and conducted to educate providers and ultimately enhance patient care delivery.

Prospective Improvement

Prospective QI may be in the form of primary education of EMS personnel, continuing education, periodic skill evaluation, and training programs. This type of improvement is seen as a front-end approach to improvement.

Concurrent Improvement

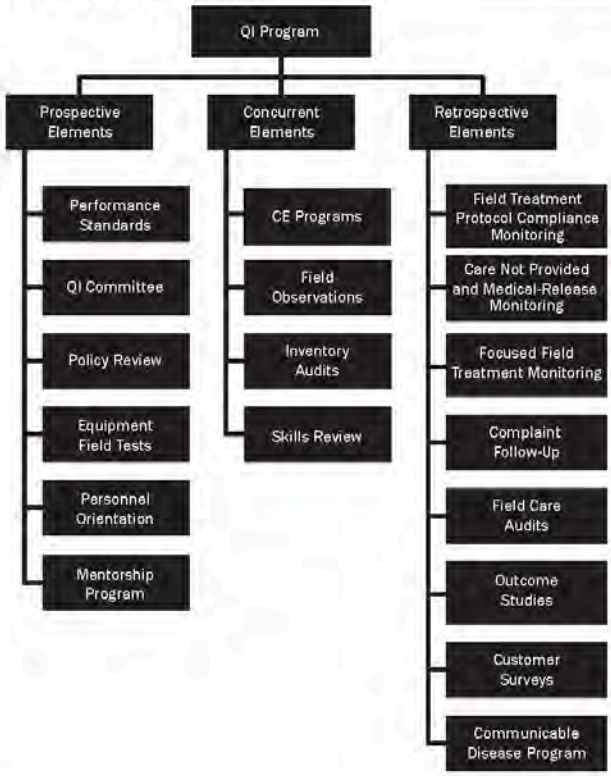
Concurrent QI is achieved through direct observation of performance of EMS providers at the time of service provision. Most EMS agencies have a chain of command that includes EMS supervisors or officers that conduct direct oversight and leadership of providers. Direct supervision or oversight on the scene of a cardiac arrest or an automobile collision by a medical director or EMS officer is an example of concurrent QI.

Retrospective Improvement

Retrospective QI may be in the form of documentation, case reviews, or audits. Patient care records can be checked for completeness and accuracy in order to determine the level of compliance with established agency policies and protocols. Retrospective QI involves activities that look back to see if quality service was provided. Review of patient care records, response surveys mailed to patients and families, interface with other EMS responder agencies, surveys of receiving hospitals, response time studies, and high-risk call reviews are reflective of retrospective QI.[25,26]

Figure 1 is an example of all three types of current QI models found in an effective EMS QI program.

Figure 1: Example of Quality Improvement[27]



Six Sigma in EMS

Six Sigma is a process improvement methodology approach that focuses on the ability to reduce variation. The concept and training program was originally developed by Bill Smith at Motorola in 1986 and represented more than 60 years of QI practices.[28] This philosophical approach has been well used in the retail and manufacturing sector, but EMS agencies are adapting the process to their environment. Examples of agencies using this process are Lee County, FL and Memphis, TN. There are several books on the market related to this method and variations of this method, like *Lean Six Sigma*, that meets the service industries needs for quality management. It should be noted that there are other quality improvement approaches and tools. Like the Six Sigma method, most are nonproprietary.

The basis of Six Sigma is the usage of data and statistical analysis to identify and modify processes within an organization or project team. Six Sigma incorporates a top-down approach where quality is owned by everyone and directed by those in top management. Process improvement where Six Sigma can be of assistance may include

- hiring processes;
- QI processes;
- response times;

- offload times at hospitals;
- revenue recovery; and
- customer satisfaction.

Six Sigma can assist with prioritizing, selecting, supporting, and managing QI initiatives in all aspects of an organization.[29]

HIPAA and Quality Improvement

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) enacted Federal protections for personal health information. The increased privacy protection awareness and regulations can result in some covered entities not recognizing EMS as a vital link in the patient's progression through the health-care system. EMS records need to be linked with hospital records in order to support patient outcome data that a medical director will need to perform comprehensive QI activities.

QI measures are subject to HIPAA's minimum necessary standard. This means that only the minimum amount of information necessary to conduct a quality review or consultation on the incident should be disclosed. Copies of patient care documentation used in case review activities must have all nonessential information redacted, such as the patient's name and address.

To avoid difficulties in performing patient followup and outcome activities with receiving facilities, it is recommended that the medical director assist in facilitating the need for the agency's QI program manager to obtain contact points at each receiving facility for this purpose. Multidimensional case reviews with providers, emergency department staff, and agency leaders will assist in discovering potential QI opportunities.

Performance Measures

Agency evaluation using performance measures can be imperative in the overall quality and effectiveness assessment of an EMS agency, particularly if the performance measure has been validated by peer-reviewed and evidence-based literature. A performance measure is a quantifiable criterion that relates to program quality. Internally, these indicators can be used as a quality evaluation and planning tool to determine and track agency activities.[30] Externally, the indicators can be used as comparative and objective measures across different agencies. An ideal measure is one that is not only quantifiable, but one that has been shown to make differences in patient outcomes. It should be noted that a clinically relevant "best practices" approach should be used related to performance measures until true evidence is accumulated. Examples of performance measures used in QI activities are

- turn out times for response vehicles;
- distance or locations of EMS units; and
- time to treatment for time-sensitive clinical conditions (e.g., time of patient contact to ECG acquisition time in ST segment elevation myocardial infarction (STEMI) patients).

International Association of Fire Fighters (IAFF)/International Association of Fire Chiefs (IAFC) EMS System Performance Measurement

Together, the IAFF and the IAFC constructed, field-tested, validated, and published an EMS System Performance Measurement instrument in 2002. This instrument consists of 15 EMS quality indicators, definitions, and related performance measures. The publication provides background information relating each indicator to the overall quality assessment of an EMS agency. The document also explains existing standards (or lack thereof), potential agency goals, and identifies needed data collection related to each measure.[31] A sample of the performance measures can be referenced in Appendix H.

Meyers et al., *Prehosp Emerg Care: Evidence-Based Performance Measures for Emergency Medical Services Systems*

In 2007, the U.S. Metropolitan Municipalities' EMS Medical Directors' Consortium developed and published evidence-based performance measures for EMS systems. These performance measures include a broad base of clinical situations and discuss EMS interventions. A sample of these outcome-centric benchmarks can be referenced in Appendix H.

Several other organizations have also participated in efforts to establish consensus standards for quality measurement in EMS. These organizations include National Fire Protection Association (NFPA) (NFPA 450, *Guide for Emergency Medical Services and Systems*), NHTSA ("EMS Performance Measures—Recommended Attributes and Indicators for System and Service Performance"), Commission on Accreditation of Ambulance Services (CAAS), American Society for Testing and Materials (ASTM) F-30, American Heart Association (AHA), as well as local and State health authorities.[32] Medical directors are encouraged to use all of these resources to aid in their understanding of the concepts and assist with the implementation of QI and performance measure activities.

Benchmarking

Benchmarking is the practice of setting targets for a particular function by evaluating other related performers, either within or outside an organization. In a broader sense, benchmarking involves looking for and using new ideas and best practices for the improvement of processes, products, and services.

Unfortunately, there are tremendous gaps in data collection, QI, and benchmarking practices in the EMS industry. There are real and perceived barriers involved in this situation which have contributed to poor industry-level outcome tracking and wide variances in data availability to perform benchmarking activities. These barriers can include an agency's existing information management systems, data collection practices, and difficulties in gathering and assimilating clinical information as the patient travels through the healthcare continuum. These factors have contributed to EMS strategies, ranging from agency model development to patient treatment activities, having questionable benefit in overall patient outcomes. Many EMS practices have evolved from tradition or nonconventional application of in-hospital care modalities.

A needed component in addressing this industry information gap is the standardization of data elements so that EMS databases at all levels (local, regional, State, and Federal) can be linked. NHTSA, in coordination with the Health Resources and Services Administration, has developed the National EMS Information System (NEMSIS) which includes a national EMS database and data definitions that can be used for the evaluation of patient and agency outcomes, be a source for benchmarking performance, and facilitate the development of industry research and training curriculums.[33] The majority of States have agreed to participate with the project but their implementation timelines vary. In order to understand how the NEMSIS project is impacting a medical director's agency, the medical director should contact their State EMS oversight agency for additional information. The following website is a useful source for information on NEMSIS: www.nemsis.org

As the EMS industry continues to evolve, performance documentation will be critical to demonstrate system effectiveness. In the interim, medical directors should establish collaborative relationships with other medical directors in their region and State. Medical directors may also find particular value with establishing these relationships with other similar size and demographically equivalent agencies in order to perform benchmarking activities.

When performing benchmarking, a medical director needs to decide what information and data will be used during the process. The process needs to begin with evaluating your agency's performance measures. Performance measures identify your agency's accomplishments and benchmarking that information to other agencies' outcomes can be a beneficial exercise in QI efforts.

Benchmarking efforts often use data elements such as work schedules, response times, and number of specific patient care encounters (e.g., cardiac arrests). The medical director should not focus only on time-centered measures, such as how fast the agency arrives and the length of transport times as examples. The medical director should work with the agency's leadership to determine all aspects of EMS service delivery to identify where benchmarking may help to improve their agency's performance. These efforts will assist the medical director in ensuring the EMS agency is providing a quality and highly-valued service which is meeting system expectations and demands.

Best Practices

Closely related to benchmarking activities is the understanding of the EMS industry's best practices. Researching best practices can aid a medical director in their decisionmaking in the multidimensional environment they operate in. The best practice techniques, processes, methods, and policies can assist the medical director in implementing new initiatives with fewer complications, or in refining existing practices.

There are a multitude of sources where a medical director can research EMS industry best practices. Professional organizations and associations such as the American College of Emergency Physicians (ACEP), National Association of State EMS Officials (NASEMSO), National Association of EMS Physicians (NAEMSP), NFPA, IAFC, IAFF, NAEMT, International Association of EMS Chiefs (IAEMSC), National EMS Manager's Association (NEMSMA), as well as State EMS offices, and other local EMS agencies are all sources for information. Journals and industry periodicals will publish information vital to a medical director's decisionmaking considerations and be a source of consolidated research on a given topic. Best practices are available for equipment-related issues, training and education programs, testing environments, patient care-related activities, and QI initiatives.

The National Fire Academy (NFA) in Emmitsburg, MD, offers several operational and managerial courses in which are open to all service delivery models of EMS and are free of charge. One emerging course that applies to the improvement of service delivery in EMS is the Emergency Medical Services: Quality Management (EMS:QM). Information pertaining to NFA EMS courses can be found at:

www.usfa.dhs.gov/nfa

www.usfa.dhs.gov/media/press/2011releases/012711.shtm

Ambulance Service Accreditation

A mechanism to recognize an agency's efforts and accomplishments is to consider pursuing accreditation for their EMS agency. Standards for accreditation are designed to increase operational efficiency and clinical quality, and decrease risk and liability to your organization.[34] The CAAS, the Center for Public Safety Excellence (CPSE), and the Commission on Accreditation of Medical Transport Systems (CAMTS) are industry organizations that recognize emergency service best practices through their accreditation processes. There are numerous benefits for an agency, regardless of the agency type (e.g., fire-based, private) to achieve accreditation, including positive public perceptions, an external validation for local officials and the medical community that the agency underwent careful review, and recognition of the efforts of all personnel affiliated with the agency. Efforts to obtain and maintain accreditation status is another area where the medical director must cooperatively work with agency leadership to achieve this goal.

EMS Research

EMS is in its relative infancy as an industry and as a method of delivering health-care services. Research activities in EMS are progressing, but have historically been recognized as one of the weaknesses in refining patient care and systems design in EMS. Several EMS research initiatives related to medications, equipment,

and treatment modalities are underway and have the potential to influence the EMS patient care delivery arena. A medical director should use the results of evidenced-based EMS research to evaluate and adjust clinical practices, equipment usage, and the delivery of EMS services. The medical director should use regular journal reviews and continuing education opportunities to stay abreast of developments in research and patient care that could influence prehospital care. The medical director should also consider the involvement of their agency in appropriate research studies and pilot programs to further advance EMS care.[35] The NFA also has a Hot Topics Research in EMS course that medical directors may be interested in. Additional information can be found at: www.usfa.dhs.gov/nfa

Health and Safety of Medical Directors and Providers

The medical director should be an advocate for health and safety issues and for safer workplace practices. The Occupational Safety and Health Administration (OSHA), a regulatory agency in of the Department of Labor (DOL), works to ensure safe working conditions for personnel by establishing and enforcing standards, as well as providing workforce education and training. OSHA provides workforce oversight either directly through the Federal organization or through an approved State program. Medical directors should become familiar with applicable OSHA standards for EMS and have knowledge of their State's program if applicable, as well as understand the agency's investigative and enforcement procedures. The medical director needs to understand that their patient care oversight responsibilities are distinctively different than the agency's occupational physician's role and responsibility for the agency is. Typically, these two services are not provided by the same physician.

NFPA also publishes industry standards related to various EMS-related situations. One such standard that addresses personnel's minimum requirements for performing roles within an all-hazard Incident Management System (IMS) is NFPA 1026, Standard for Incident Management Personnel Professional Qualifications. Medical directors may also want to become familiar with other applicable NFPA standards.

The medical director also needs an appreciation for the physical and mental toll that extended operations can have on emergency workers. NFPA 1584, Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises identifies the minimum criteria for establishing a rehabilitation process for personnel operating at incident scene operations and training exercises, and is a document that the medical director should reference.

The use of personal safety equipment is vital to protection and safety against exposure to infection. Proper application of PPE and body substance isolation (BSI) is a cornerstone for medical director and EMS providers' safety. Appropriate use of BSI for the given situation should be a mandate for EMS providers.

The compromised use of PPE during emergency incidents or training evolutions can lead to injury or even death of the EMS provider. Personnel without appropriate levels of PPE must not be permitted to operate during emergencies or training events. Despite being intensely focused on the medical care of patients, EMS providers must wear appropriate PPE to protect against cutting forces, falling objects, exposures, and other scene hazards. An example of certain PPE specified by regulations and statues is the requirement of EMS providers to wear a high-visibility vest during roadway incident operations to aid in their visibility to other rescuers and civilians. This high-visibility clothing must meet the requirements of American National Standards Institute (ANSI)/International Safety Equipment Association (ISEA) 107; 2004 edition Class 2 or 3.[36] Additionally, NFPA 1500, Standard on Fire Department Occupational Safety and Health Program and NFPA 1999, Standard on Protective Clothing for Emergency Medical Operations should be used as a guideline for protection of prehospital providers.

Areas of safety concern should include, but not be limited to:

- head and face protection;
- ear and hearing protection;
- hand protection;
- foot protection; and
- body protection.

A health and safety area that is receiving considerable attention is the development and design of ambulances and equipment. These issues will be discussed later in the handbook, but medical directors must recognize these issues not only impact provider safety but impact the safety of the public at large. The development of dispatch and patient care protocols that also address response vehicle operations is another area for the medical director's attention and involvement.

Patient Safety

Patients also need to be shielded from the same incident elements that providers are also being exposed to. Examples of items that will help to create a safe environment for patients are

- blankets for warmth and debris protection;
- helmet;
- hearing protection;
- goggles;
- dust mask, unless patient is having difficulty breathing and/or is on oxygen; and
- shielding devices such as backboards placed to form a barrier between the patient and sharp objects or equipment.[17]

The health and safety of providers needs to be a paramount concern and a responsibility shared by every member and supervisory level in an agency. In addition to the resources discussed in the section, there are several other professional nongovernment organizations and government agencies identified in the handbook that have safety-related information and resources (e.g., IAFC, IAFF, NHTSA, U.S. Fire Administration (USFA), Department of Health and Human Services (HHS), CDC, OSHA, National Institute for Occupational Safety and Health (NIOSH), National Volunteer Fire Council (NVFC)).

Agency Dynamics

A medical director has responsibility for the oversight of many multifaceted and dynamic aspects of an emergency medical services (EMS) agency. Medical directors must understand the wide depth and breadth of involvement as it relates to interacting and interfacing with your EMS agency, its leadership, and its many providers. Understanding the medical director's role is crucial to success, both at the individual and agency levels.

Ambulance Service Certificate of Need

A medical director may become involved in the implementation of a new EMS agency or a planned expansion of an existing EMS agency. The medical director, along with the EMS agency leaders, must comply with any applicable State and local regulations related to the establishment and expansion of an EMS agency.

In some States, EMS agencies may be required to obtain a Certificate of Need for their agency startup or planned expansion. If applicable, the Certificate of Need process can be found in State and/or local statues. This process is designed to identify the geographic area in which the agency may operate, identify the type of service to be provided, and provide authorization for the service to begin operations. The Certificate of Need process is not uniformly required across all regions and/or States. The medical director must check with the appropriate local, regional, and State entities to determine what governmental regulations may be related to EMS agency licensing and operations.

As EMS authorizing agencies vary from State to State, it is challenging to address each States' regulating authority to the reader in general terms. Some States have very involved EMS regulatory offices with robust authority, while others have little authority and responsibility and is quite localized. As will be pointed out several times within this handbook, the medical director must understand how systems operate within their State and understand the regulating authority's role.

Public Relations

Media Inquiries

The medical director is viewed by both the media and the public as a trusted official who needs to be concerned with the quality of their EMS agency's performance and must be highly responsive to inquiries. Establishing positive media relations is important for an EMS agency and the medical director. There are numerous ethical and legal considerations which must be evaluated when preparing and releasing media responses. These considerations include the Health Insurance Portability and Accountability Act of 1996 (HIPAA) related issues, protecting investigative information from premature release, and the Freedom of Information Act (FoIA) related issues. While some EMS agencies may have a public relations office or officer that can assist the medical director, it is critical that the medical director work in concert with the agency's leadership to coordinate responses to all media requests for information. Medical directors may not have previous experience with media relations and this may be an area that medical directors request specific agency-level training.

EMS Advocacy

Medical directors should take an active role in promoting their EMS agency and being an advocate for the overall EMS industry. The medical director position is dynamic and will include interactions with many external system stakeholders. The medical director can be an effective liaison to these external stakeholders and leverage a great deal of credibility in communicating EMS agency accomplishments and needs. The medical director should coordinate these advocacy activities with the agency's leadership to achieve a shared, consistent message and to increase the effectiveness of efforts.

Advocacy activities may involve public speaking appearances to city or county governmental or elected officials in an attempt to articulate local EMS agency needs and service delivery issues, provide budget justifications, and describe the impact of State and local EMS rules and regulations. The advocacy role will certainly require the medical director to interact with other health-care professionals, public health officials, and members of other emergency service agencies to promote and coordinate the involvement of the EMS agency as an active partner in the emergency response and medical community.

Credentialing in EMS

Another aspect of the medical director's oversight is verification of your EMS providers' credentials. The medical director may seek assistance with this function within the administrative staff of their agency. Specific items related to EMS credentialing vary from region to region and State to State. As previously discussed in the handbook, some States may license providers while other States will certify them. The medical director should check with the State EMS office for additional guidance. EMS personnel education and training history, licensure or certification history, active or nonactive status, and general contact information may need to be available for credential review by State or regional EMS offices.

EMS Education Program Dynamics

Accreditation of Education Programs

The "EMS Agenda for the Future" recommended a single national accreditation agency for all EMS certification levels be established. Yet, not all levels of EMS education programs have a national requirement to be an accredited program. Currently, there are no national level accreditation requirements for educational programs below the level of paramedic. In November 2007, the National Registry of Emergency Medical Technicians (NREMT) Board of Directors implemented a new requirement that in order to be eligible to attempt the NREMT testing and credentialing process, all paramedic applicants must have graduated from an accredited program.

This requirement has a targeted effective date of January 1, 2013. Paramedics who are certified prior to January 1, 2013, will be "grandfathered" and are not impacted by this new requirement. Once again, the medical director needs to check with their State's EMS oversight agency to receive guidance on any State-level requirements for educational programs since not all States use NREMT testing for all or any level of EMS provider.

If an agency has an initial training program for the paramedic certification level, or is seeking to establish this type of program, the medical director should seek educational program accreditation to ensure national educational standards are met. The Commission on Accreditation of Allied Health Education Programs (CAAHEP), through its Committee on Accreditation of Educational Programs for the Emergency Medical Services Professions (CoAEMSP), is the only national agency that offers EMS paramedic education program accreditation.

Though the CoAEMSP standards and guidelines may be adopted for the education infrastructure section of a paramedic educational program, this does not mean the program is CoAEMSP accredited. At present, some paramedic programs may only have a State approval process, but not a CoAEMSP accreditation requirement.

For most EMS educational programs, the medical director should commit a significant amount of time to the program, for which appropriate compensation is often necessary. To meet CoAEMSP standards, the medical director must

- be a physician currently licensed to practice medicine within the United States and currently authorized to practice within the geographic area served by the program, with experience and current knowledge of emergency care of acutely ill and injured patients;

- have adequate training or experience in the delivery of out-of-hospital emergency care, including the proper care and transport of patients, medical direction, and quality improvement (QI) in out-of-hospital care;
- be an active member of the local medical community and participate in professional activities related to out-of-hospital care; and
- be knowledgeable about the education of the Emergency Medical Services Professions, including professional, legislative, and regulatory issues regarding the education of the Emergency Medical Services Professions.

In addition, the medical director must be responsible for all medical aspects of the program, including, but not limited to:

- review and approval of the educational content of the program curriculum to certify its ongoing appropriateness and medical accuracy;
- review and approval of the quality of medical instruction, supervision, and evaluation of the students in all areas of the program;
- review and approval of the progress of each student throughout the program and assist in the development of appropriate corrective measures when a student does not show adequate progress;
- assurance of the competence of each graduate of the program in the cognitive, psychomotor, and affective domains;
- responsibility for cooperative involvement with the program director; and
- adequate controls to assure the quality of the delegated responsibilities.[38]

CoAEMSP standards and guidelines regarding the role of the medical director can be obtained from their website: www.coaemsp.org/Documents/Standards.pdf

Certification of Providers

Following the successful completion of an approved EMS educational program, the prospective EMS provider is eligible to attempt certification and/or licensing testing. The battery of testing is both didactic and practical in nature. This process provides verification that an individual possesses the necessary knowledge and skills to perform at the provider's certification level.[39]

The NREMT is the national testing body for the provider levels identified in the "National EMS Scope of Practice Model." NREMT facilitates certification by conducting standardized registration and testing (written and practical exams). NREMT is recognized by most, but not all States. Currently, 46 States use the NREMT for testing one or more EMS certification levels. States that do not use the NREMT must use their own developed testing requirements, which may not be recognized by other States. This variability leads to inconsistency, lack of reciprocity, and is incongruent with recommendations contained in the "Education Agenda." During their 2010 annual meeting, the National Association of State EMS Officials (NASEMSO) adopted a resolution supporting NREMT as the national EMS certification agency, and CoAEMSP as the National EMS education program accreditation agency.

Each State's EMS oversight agency has the right to certify and/or license EMS providers, including if they elect to use NREMT certification. The medical director should become familiar with related certification practices and requirements within their State.

Recertification of EMS Providers

Continuing education is a requirement for recertification and/or licensure renewal for all levels of EMS providers. Each provider level is required to complete a specified number of continuing education hours, depending on State and/or NREMT requirements. The length of time for recertification and/or licensure renewal varies among the States and typically ranges between 2 to 3 years. NREMT has a 2-year recertification period.

Recertification requires continuing education and competency verification. Medical directors must again become familiar with related certification and recertification requirements within their State. Listed below are examples of NREMT recertification requirements which most States use for initial certification and recertification.

NREMT Biennial Recertification Requirements

Emergency Medical Responder (EMR) Recertification Requirements

- The EMR can recertify through two different options:
  - traditional refresher course—an approved Department of Transportation (DOT) National Standard Emergency Responder Refresher or Continuing Education Coordinating Board for Emergency Medical Services (CECBEMS) approved refresher course; or
  - continuing education topical hours—a refresher may be completed by attending continuing education classes which cover the required topics and hours.
- Submission of approved cardiopulmonary resuscitation (CPR) certification.
- Obtain verification of skill competence by medical director or training program director.
- Pay a recertification application fee.

Emergency Medical Technician (EMT) Recertification Requirements

- Complete a total of 72 hours of education which consists of:
  - an approved 24-hour DOT National Standard EMT Refresher Course or continuing education hours, specifically meeting the refresher curriculum objectives; and
  - complete 48 hours of additional continuing EMS-related education.
- Submission of approved CPR certification.
- Obtain verification of skill competence by medical director or training program director.
- Pay a recertification application fee.

Advanced EMT Recertification Requirements

- Complete a total of 72 hours of education which consists of:
  - an approved 36-hour refresher course or continuing education hours specifically meeting the refresher curriculum objectives; and
  - complete 36 hours of additional continuing EMS-related education.
- Submission of approved CPR certification.
- Obtain verification of skill competence by medical director or training program director.
- Pay a recertification application fee.

Paramedic Recertification Requirements

- Complete a total of 72 hours of education which consists of:
  - an approved 48-hour DOT National Standard Paramedic Refresher or continuing education hours, specifically meeting the refresher curriculum objectives; and
  - complete 24 hours of additional continuing EMS-related education.
- Submission of approved Advanced Cardiac Life Support (ACLS) and CPR certification.
- Obtain verification of skill competence by medical director or training program director.
- Pay a recertification application fee.

Exam Option—Certified EMS providers may make one attempt to demonstrate continued cognitive competency by taking an examination in lieu of documenting continuing education. The exam attempt must be made 6 months prior to their certification expiration date.

Agency Compliance Considerations

Collective Bargaining Agreements

Collective bargaining is a process of negotiations between employers and labor unions to achieve workplace agreements. Items that are typically discussed and collectively bargained include wage compensation, work hours, health and safety, occupational environment, benefits, and union and management rights. In addition, procedures to resolve disputes and grievances may also be bargained. The resulting agreement will be a written collective agreement, contract, or memorandum of understanding (MOU) between the employee union, which acts as the bargaining agent, and the employer. In some States, collective bargaining may involve binding arbitration. In these areas, when negotiation efforts fail, the process may reach impasse. At this point, employees and employers must present their items of interests (e.g., safety issues) to a neutral arbitrator or arbitration panel for a decision. Based on local or State laws, the arbitrator's decision may be binding on both parties. The resulting decision then becomes part of the collective agreement, contract, or MOU that is effectively a legal document.

The medical director will need to establish a productive working dialogue and relationship with all work representative groups within an agency. There is also a need to have a basic understanding of any collective bargaining agreements that may be in place.

In addition to understanding employer/employee agreements, the medical director also needs a clear understanding of his/her role in provider oversight as it relates to patient care delivery activities. There may be instances such as QI initiatives that could result in the remediation or training enhancement of an EMS provider. It is important for the medical director, the employee, and the union to understand that while they are responsible to patients for providing the highest quality of available care, they are also committed to fostering a productive work environment in which to deliver that care. Issues related to the oversight role of the medical director and the relation to any progressive discipline procedures are discussed in the Becoming a Medical Director chapter of this handbook.

Federal, State, and local legislation provisions need to be reviewed as they relate to mandated or formal QI programs. The medical director should seek out union assistance and interact professionally in establishing the understanding of the medical director's medical oversight mission. Any service delivery-related medical practices and/or policies that a medical director desires to institute should be clearly articulated verbally and in writing, and be open for discussion prior to final implementation.

Right to Work States

In 22 States, there is a Right to Work law. Right to Work laws permit individuals to decide if they prefer to join or financially contribute to a union. In these States, employees cannot be required to join or pay dues to a labor union. In these States, if an individual elects to have joined a union but then later decides to resign from their union, they can still be covered by the collective bargaining agreement that was in place during their membership time period. The medical director needs to understand the labor environment their agency operates in to avoid any potential conflicts and establish the appropriate professional relationships.

Industry Regulations and Standards

As previously discussed in the EMS Agency and Its Stakeholder chapter of this handbook, the medical director must be aware of entities that produce industry regulations, standards, and guidelines affecting EMS providers and agencies. Two of the most commonly referenced agencies are Occupational Safety and Health Administration (OSHA) and National Fire Protection Association (NFPA). These organizations and the documents they produce can assist the medical director in fostering a healthy and safe working environment for their providers. The medical director must be aware that OSHA regulations are enforceable by law but the NFPA produces industry standards and guidelines that should be considered for adoption by the EMS agency. Appendix G contains selected examples that apply to common conditions applicable to emergency response agencies including EMS.

Fiscal Management Issues

Budgeting

Regardless of if your EMS agency is public, private, for-profit, or nonprofit, it will have a budgetary process that provides the agency's fiscal management plan. How the EMS agency's leadership manages its budget will dictate the agency's long-term viability. The agency's budget should be a driving force for what is monitored and to aid decisionmaking on a daily basis. The budget process can be helpful with:

- monitoring of day-to-day operations;
- resource for planning activities;
- aid in the identification of organizational sentinel events; and
- facilitates evaluation and selection of potential solutions based on data.[40]

The medical director needs to cooperatively work with the EMS agency's leadership in the budgetary planning process by projecting program needs and costs to facilitate the development of a comprehensive financial plan.

Federal and State Funding Sources

Federal level funding is typically distributed to States and may be further passed on to localities. Many States allocate funding for State oversight agencies and local EMS agencies through a variety of general fund allocations, administration of grant programs, or incentive programs that return a portion of collected taxes or fees back to the locality. Some of the funding sources that are available for EMS activities at the Federal and State levels include

- vehicle-related registration fees;
- traffic enforcement-related fees;

- health and/or homeowner's insurance surcharges;
- grant programs; and
- general fund revenue allocations.

Local Funding Sources

Local funding sources can also be derived from a variety of sources. Listed below are some general categories that localities will often have as funding sources:

- Taxes—General property, local income, sales, and district taxes. This is the most common source of municipality-controlled funding for EMS agencies.
- Fees—These include fees for construction-related permits, special events permits, hazardous use permits, facility inspections, and building or life safety code violations.
- Fines and citations—Agencies may charge fees for actions that are inconsistent with the law, such as traffic enforcement fines.
- Development impact fees—New developments may be required to pay for the impact the development will have on the locality's capital outlays such as new fire station construction and associated equipment purchases.
- Revenue recovery—Billing third-party insurance companies to recover reimbursement allowed for EMS transport services. Reimbursement rates will be based on the level of service provided and mileage traveled.
- Subscriptions—An annual fee paid to an EMS agency to offset any insurance copayments so there are no out-of-pocket costs incurred by the patient.
- Benefit assessment charges—Administered similar to property taxes, these charges are based on factors such as being located in close proximity to fire stations, having reduced insurance rates, or the availability of special services.
- Strategic alliances—Agencies may form alliances and partnerships with other agencies to provide services under an annual contract with associated fees.
- Grants—Governmental and private entity grants exist.
- Sales of assets and services—Agencies may sell used equipment or services.

Agency-Level Funding Sources

Career and volunteer fire and EMS agencies may raise a significant amount of funds from the private sector. Agencies are increasingly turning to private donations, often by setting up nonprofit foundations. Private sector funding sources include the following:

- private foundations;
- corporate donations; and
- public and private partnerships.

Revenue Recovery Sources

Many EMS agencies have instituted revenue recovery programs in which insurance companies, including Medicare and Medicaid, are billed for EMS transport services. Costs of emergency care are already included in actuarial calculations of insurance premiums and are a viable revenue source for EMS agencies.

Medicare and Medicaid, as a means for generating revenue for the agency, can only be billed by transporting EMS agencies for the level of care administered during the patient transport and mileage traveled with the patient onboard. Agencies may perform their own billing services or contract with a billing services company. If a billing contractor is used, the billing company will charge a fee which is typically a percentage of the collected revenue. Fee percentages as well as the billing company's collection practices are negotiated contractual items with the EMS agency. Medical directors should be very familiar with the agency's policies and procedures for billing insurance companies including their role, if any, in any signoff or review procedures.

Funding for Medical Directors

Funding for medical oversight activities, when the oversight is not provided on a volunteer basis, can come from a variety of sources which may include the following:

- Hospital or physician practice groups may provide financial and administrative support for the EMS medical director.
- Agency dedicated funding for medical director compensation.

Apparatus and Equipment

Ambulance Design

To ensure safety for both EMS providers and patients in ambulances, there are industry standards that address ambulance design and construction. Currently, the most popular ambulance specifications are the Federal KKK-A-1822 standard and the National Truck Equipment Association Ambulance Manufacturers Division standard (2007 version). Ambulance design is currently undergoing a period of increased interest and scrutiny with the goal being to increase the safety of patients and providers. Recently, the NFPA has formed a multidisciplinary committee to develop a new ambulance design standard for the EMS industry. This new standard will replace the existing KKK-A-1822 specifications and will address the design, construction, and testing requirements for ambulances. The new standard will be NFPA 1917, *Standard for Automotive Ambulances* and is expected to be published in 2013.

EMS Equipment and Technology

EMS equipment is specially designed to be compact, portable, durable, and lightweight, and technology is ever-evolving and becoming more sophisticated. The type and minimum amount of equipment required for both basic life support (BLS) and advanced life support (ALS) transport vehicles is regulated by the State in which the ambulance operates.

Computers, cell phones, Bluetooth, and other technology have also revolutionized EMS care. Not only has technology helped save patients' lives, it is also beginning to improve data capturing and reporting processes. Some EMS agencies have implemented, or plan to implement, electronic patient care reporting systems. When an EMS agency is capable of using this technology, traditional paperwork can be electronically captured and transmitted wirelessly to receiving facilities.

Medical directors should be closely involved in the selection and purchase of medical equipment. It will be important for the medical director to stay abreast of innovations, both positive and negative, and can expect to be approached by equipment vendors and providers with requests to introduce the latest devices

and technology into practice. The medical director will need to carefully review and evaluate these recommendations as often as the requests may be made in advance of evidence-based information or criteria.

Medication Supply and Storage Practices

Medications are administered to patients by EMS providers in accordance with their agency protocols and standing orders. The process in which EMS agencies receive, store, and exchange their medications will vary due to many factors such as EMS agency type (e.g., governmental, private, hospital-based, etc.), agency or regional pharmaceutical agreements, and related State and Federal regulations. Listed below are a few examples of the different processes for medication supply, storage, and exchange. The example list is not intended to describe all the various processes an EMS agency may use for this need:

- Agreement with a hospital pharmacy to provide and exchange EMS medications without any cost to the EMS agency. In these scenarios, the hospital pharmacy provides the initial stock for the EMS medications and exchanges the medications used.
- Agreement with a hospital pharmacy that EMS is billed for their initial medication inventory. Exchange of medications will occur at the receiving hospital(s).
- EMS agency will perform their own purchase, storage, and exchange of their medications.

Regardless of the process used by an EMS agency, the medical director must be knowledgeable on all related local, regional, State, and Federal regulations and requirements that affect their EMS agency's medication supply and storage practices.

If an EMS agency purchases, stores, and/or exchanges their own medications, the medical director may be responsible for enabling the agency to obtain equipment and medications. The medical director's State license will allow the EMS agency to obtain medications such as atropine, dextrose, and epinephrine. Scheduled medications such as morphine, fentanyl, and midazolam must be purchased using a prescribing number issued by the Drug Enforcement Agency (DEA). Medical directors may not use their personal DEA number to provide an EMS agency stock of controlled substances. Personal provider DEA numbers may only be used when prescribing to a specific patient. A medical director will need to obtain a separate DEA number for their EMS agency duties to avoid possible conflicts with the physician's practice. Medical directors can obtain a DEA number by completing an online application or download the forms from the following website at: www.deadiversion.usdoj.gov/drugreg/reg_apps/

The medical director must understand all State and Federal licensing requirements related to this activity. Numerous administrative and operational policies will need to be implemented to comply with all State and Federal regulations regarding medication ordering, storage, and exchange. Samplings of administrative and operational policies are listed below:

- Appropriate licensing of the EMS facility for storage of medications. To obtain licensing, numerous administrative and operational policies related to facility security, inventory security, storage parameters, and recordkeeping will need to be in place.
- Selection of a pharmaceutical vendor and compliance with medication ordering regulations.
- Requirement for recordkeeping, inventory practices, and diversion reporting for all medications.
- Requirement for documentation and process for wastage/disposal of controlled medications.
- Patient care documentation related to medication administration.

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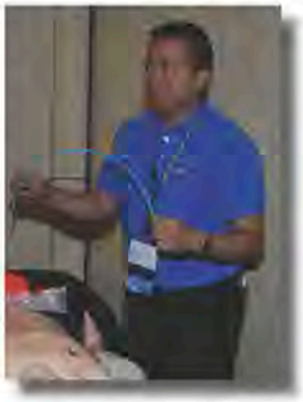
Moving Forward as a Medical Director



No emergency medical services (EMS) medical director should feel isolated and without the support of peers and other dedicated resources. Networking with medical directors of neighboring agencies is an invaluable and readily available resource. In addition, medical directors are urged to seek out additional logistical support and educational opportunities from the various regional, State, and national governmental agencies and national professional organizations listed within this handbook and its appendices.

This handbook is intended to provide a reasonable overview of those fundamental issues that regularly impact the medical director operating at the EMS agency level. EMS, in the United States, represents a dynamic and diverse reality molded by local necessities, regional logistics, and State and national regulations. For this reason, it is safe to say that no two EMS agencies are the same. A medical director needs to understand the basic concepts presented here and then adapt them to both their own needs and the needs of their EMS agency. It is only through thoughtful observations, frank conversations, and committed involvement with the agency's leadership and personnel, that the medical director will be able to fully understand the dynamics of the agency and optimize their role as a medical director.

After settling into the role of medical director, the joys of shared values with EMS providers, leading and assisting with your agency's continued medical service delivery development and refinement, and making a valuable and valued contribution to the community become as important as the medicine.

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Appendix A: Checklist for the New Medical Director

- ❑ Ensure affiliation agreement is reasonable with particular attention to expectations, organizational support, liability coverage, and time expectations.
- ❑ Have affiliation agreement reviewed by independent legal and tax advisors.
- ❑ Negotiate final affiliation agreement.
- ❑ Agency orientation with emergency medical services (EMS) Command Staff members.
- ❑ Meet with your agency leaders and develop strategic planning.
- ❑ Learn about dispatch practices and the Public Safety Answering Point (PSAP).
- ❑ Attend provider training drills.
- ❑ Attend agency orientation sessions.
- ❑ Shadow outgoing medical director, if possible.
- ❑ Become familiar with your EMS oversight agencies (State, regional, and local).
- ❑ Establish a comprehensive bottom-up quality management program that includes provider peer review activities with guidance by the medical director and explicit support from the agency's leadership.
- ❑ Respond and ride-along with EMS personnel to gain an understanding of capabilities, challenges, and opportunities for improvement for your providers. Do not operate in a vacuum. Be involved and engaged.
- ❑ Train with EMS providers in the areas of confined space, trench rescue, extrication, and hazmat operations in order to develop or revise specialized EMS protocols and standing orders for your agency.
- ❑ Initiate networking relationships with other medical directors in your region.
- ❑ Attend appropriate National and State conferences and meetings to network with other medical directors.
- ❑ Open lines of communications with receiving hospitals and local medical society.
- ❑ Orientation with personal protective equipment (PPE), communication equipment, and other agency-issued supplies.

Note: Seek out advice of EMS leadership for the completion of this list.

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Appendix B: Glossary

Advanced Cardiac Life Support (ACLS)—A course that is taught by the American Heart Association (AHA). The course uses algorithms to educate and enhance provider skills in treating victims of cardiac arrest or other cardiopulmonary emergencies.

Advanced Emergency Medical Technician (AEMT)—This individual provides basic and limited advanced emergency medical care and transportation for patients. The AEMT has completed additional training in airway management, intravenous and/or intraosseous fluid administration, and specific emergency care medications and clinical procedures. The AEMT performs interventions with the basic and limited advanced equipment typically found on an ambulance.

Advanced Life Support (ALS)—All basic life support measures, plus invasive medical procedures including intravenous therapy, cardiac defibrillation, administration of medications and solutions, use of ventilation devices, and other procedures by State law and permitted by the medical director.

Ambulance—A vehicle designed and operated for transportation of ill and injured persons, equipped and staffed to provide for first aid or life support measures to be applied during transportation.

American College of Emergency Physicians (ACEP)—Organization of physicians associated with emergency medicine. ACEP is a leader in the development of position statements relating to emergency medical services (EMS) and trauma issues. In addition, the College develops guidelines to assist in the implementation of the position statements (e.g., Trauma Care System Guidelines). ACEP publishes the Annals of Emergency Medicine.

Automatic External Defibrillator (AED)—A device that administers an electric shock through the chest wall to the heart using built-in computers to assess the patient's heart rhythm and defibrillate as needed. Audible and/or visual prompts guide the user through the process.

Basic Life Support (BLS)—Generally limited to airway maintenance, ventilation (breathing) support, cardiopulmonary resuscitation (CPR), AED use, hemorrhage control, splinting of fractures, and management of spinal injury, protection, and transportation of the patient with accepted procedures.

Benchmarking—The process of comparing one's business processes and performance metrics to industry bests and/or best practices from other industries. Dimensions that are typically measured include quality, time, and cost.

Body Substance Isolation (BSI)—Specific steps taken to help minimize exposure to a patient's blood and other body fluids. Examples are the wearing of protective gloves, mask, gown, and eyewear.

Chain of Command—The orderly line of authority within the ranks of the incident management organization.

Collective Bargaining—Method of determining wages, hours, and other conditions of employment through direct negotiations between the union and the employer. Normally, the result of collective bargaining is a written contract that covers all employees in the bargaining unit, both union members and nonmembers.

Collective Agreement—A contract (collective agreement and contract are used interchangeably) between the union acting as the bargaining agent and the employer, covering wages, hours of work, working conditions, benefits, rights of workers and union, and procedures to be followed in settling disputes and grievances.

Commission on Accreditation of Ambulance Services (CAAS)—A private organization established to set and assist providers in maintaining the highest standards of performance in their communities. This voluntary accreditation process includes a comprehensive self-assessment and an independent, outside review of the EMS organization.

Deployment—The procedures by which ambulances are distributed throughout the service area. Deployment includes the locations and number of ambulances that are in service for a particular time period.

Emergency Medical Responder (EMR)—Formally called First Responder, is the first individual to provide emergency care at an emergency scene. This term refers to a prehospital provider who has completed training and is certified to perform basic interventions with minimal equipment.

Emergency Medical Dispatcher (EMD)—A call-taker/dispatcher at a Public Safety Answering Point (PSAP) that is specifically trained to obtain medical information from the caller over the phone and assure the dispatch of appropriate EMS resources to a given call.

Emergency Medical Services (EMS)—The provision of services to patients with medical emergencies. The purpose of EMS is to reduce the incidence of preventable injuries and illnesses, and to minimize the physical and emotional impact of injuries and illnesses. The EMS field derives its origins and body of scientific knowledge from the related fields of medicine, public health, health-care system administration, and public safety.

Emergency Medical Services Act of 1973—This act defined an EMS system as one "which provides for the arrangement of personnel, facilities, and equipment for the effective and coordinated delivery in an appropriate geographical area of health care services under emergency conditions (occurring either as a result of the patient's condition or of natural disasters or similar situations) and which is administered by a public or nonprofit private entity which has the authority and the resources to provide effective administration of the system." This act further defined components of an EMS agency as manpower, training, communications, transportation, emergency facilities, critical care units, public safety agencies, consumer participation, access to care, patient transfer, standardized recordkeeping, public information and education, agency review and evaluation, disaster planning, and mutual aid.

Emergency Medical Services (EMS) Agency—A comprehensive, coordinated arrangement of resources and functions that are organized and prepared to respond in a timely, staged manner to targeted medical emergencies, regardless of cause, in an effort to minimize the physical and emotional impact of an emergency.

Emergency Medical Technician (EMT)—This individual possesses the basic knowledge and skills necessary to provide patient care and transportation. EMTs perform interventions with the basic equipment typically found on an ambulance.

Incident Commander (IC)—The individual responsible for the management of all incident operations, including the development of strategies and both the ordering and release of resources. This individual has the authority and responsibility for conducting incident operations and is responsible for all incident operations at the incident site.

Incident Command System (ICS)—The common organizational structure for facilities, equipment, personnel, procedures, and communications at a fire department response; in an ICS, responsibility for the management of assigned resources to effectively accomplish stated objectives pertaining to an incident.

Infrastructure—The basic facilities, equipment, services, and installations needed for functioning.

International Association of EMS Chiefs (IAEMSC)—The IAEMSC is a professional association established to support, promote, and advance the leadership of response entities and to advocate for the EMS profession.

Local Government—A designation that is given to all units of government in the United States below the State level.

National Association of EMS Physicians (NAEMSP)—Organization representing physicians dedicated to prehospital emergency medical care.

National Emergency Medical Service Advisory Council (NEMSAC)—The NEMSAC is a Federal advisory committee that provides National Highway Traffic Safety Administration (NHTSA) and the Department of Transportation (DOT) advice and recommendations from nongovernmental organizations and people on a range of EMS-related issues.

National Association of Emergency Medical Technicians (NAEMT)—The national professional organization for EMTs and EMT-Paramedics. NAEMT's goals include promoting the professional status of the EMT, supporting EMS agencies at all levels, and offering guidance in current concepts of emergency medical care and government policies related to the control, certification, and licensure of EMTs.

National Emergency Medical Services Information System (NEMSIS)—A national database and data definition dictionary for the uniform collection of EMS information.

National Fire Protection Association (NFPA)—The mission of the international nonprofit NFPA, established in 1896, is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education. The world's leading advocate of fire prevention and an authoritative source on public safety, NFPA develops, publishes, and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks.

National Highway Traffic Safety Administration (NHTSA)—The agency under the DOT responsible for preventing motor vehicle injuries. NHTSA's Office of EMS conducts research and demonstration projects, distributes state-of-the-art information, provides onsite technical assistance to States and national organizations, conducts national meetings and workshops on EMS issues, supports the development of national consensus EMS standards, and serves as liaison to national EMS/trauma organizations.

National Institutes of Health (NIH)—This branch under the Public Health Service of the Department of Health and Human Services (HHS) is responsible for promoting the Nation's health through research that may be conducted by NIH researchers or simply funded by NIH.

National Registry of EMTs (NREMT)—The NREMT was founded in 1970 as the result of a task force of the American Medical Association (AMA) to provide a national EMT certification process.

Offline Medical Direction—Consists of standing orders, training, and supervision that are authorized by the medical director. All EMS providers must follow the protocols developed and/or implemented by the medical director of their EMS agency.

Online Medical Direction—The medical direction provided to out-of-hospital providers by the medical director or designee, generally in an emergency situation, either onscene or by direct voice communication. The mechanism for this contact may be radio, telephone, or other means as technology develops, but must include person-to-person communication of patient status and orders to be carried out.

Paramedic—This individual possesses the complex knowledge and skills necessary to provide advanced patient care and transportation. Paramedics have completed advanced training in all ALS procedures perform interventions with the basic and advanced equipment typically found on an ambulance.

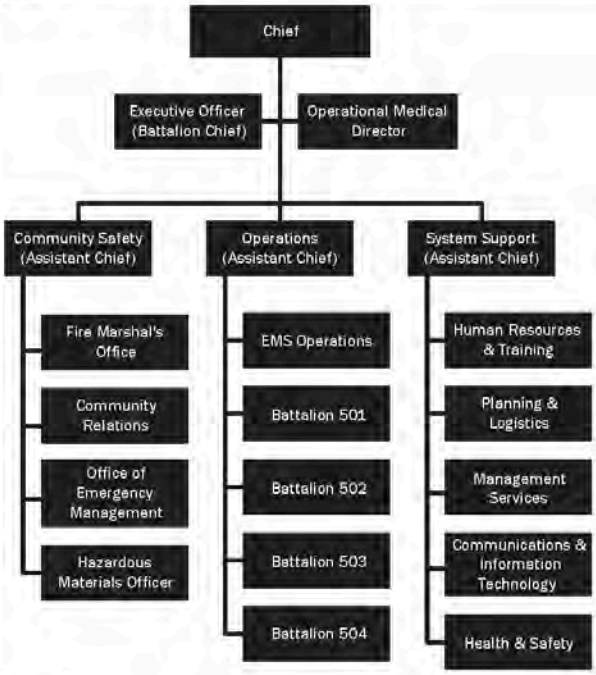
Appendix C: EMS Acronyms

AAA	American Ambulance Association
ACEP	American College of Emergency Physicians
ACLS	Advanced Cardiac Life Support
AEMT	Advanced Emergency Medical Technician
ALS	Advanced Life Support
AHA	American Heart Association
ANSI	American National Standards Institute
ATLS	Advanced Trauma Life Support
BLS	Basic Life Support
BSI	Body Substance Isolation
CAAS	Commission on Accreditation of Ambulance Services
CMS	Centers for Medicare and Medicaid Services
DHS	Department of Homeland Security
DOT	Department of Transportation
EMD	Emergency Medical Dispatcher
EMR	Emergency Medical Responder
EMS	Emergency Medical Services
EMSC	EMS for Children
EMT	Emergency Medical Technician
EVOC	Emergency Vehicle Operator Course
FEMA	Federal Emergency Management Agency
HAZMAT	Hazardous Material
HHS	Department of Health and Human Services
HIPAA	Health Insurance Portability and Accountability Act of 1996
IAEMSC	International Association of EMS Chiefs
IAFC	International Association of Fire Chiefs
IAFF	International Association of Fire Fighters
ICS	Incident Command System

ITLS	International Trauma Life Support
NAEMSE	National Association of EMS Educators
NASEMSO	National Association of State EMS Officials
NAEMSP	National Association of EMS Physicians
NAEMT	National Association of Emergency Medical Technicians
NEMSAC	National Emergency Medical Service Advisory Council
NEMSIS	National Emergency Medical Services Information System
NEMSMA	National EMS Management Association
NFFF	National Fallen Firefighters Foundation
NFPA	National Fire Protection Association
NHTSA	National Highway Traffic Safety Administration
NIMS	National Incident Management System
NIOSH	National Institute for Occupational Safety and Health
NREMT	National Registry of EMTs
NVFC	National Volunteer Fire Council
OSHA	Occupational Safety and Health Administration
PALS	Pediatric Advanced Life Support
PHTLS	Prehospital Trauma Life Support
PPE	Personal Protective Equipment
PSAP	Public Safety Answering Point
USAR	Urban Search and Rescue
USFA	U.S. Fire Administration
WMD	Weapon of Mass Destruction

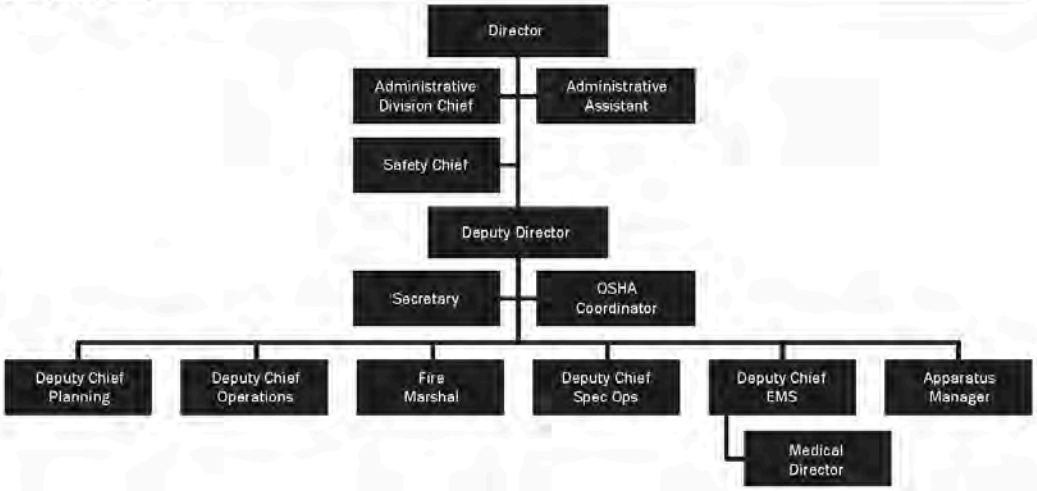
Appendix D: Sample Organization Charts

Prince William County (VA) Department of Fire and Rescue
Single Agency Example

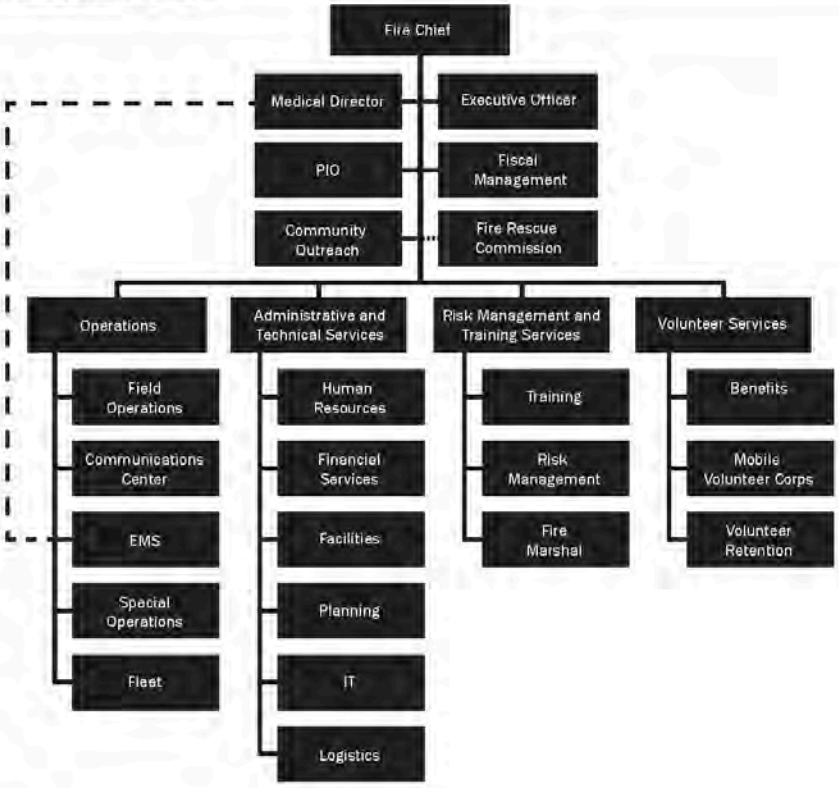


Prince William County (VA) Fire and Rescue Association
Combination System Example (12 EMS Agencies)

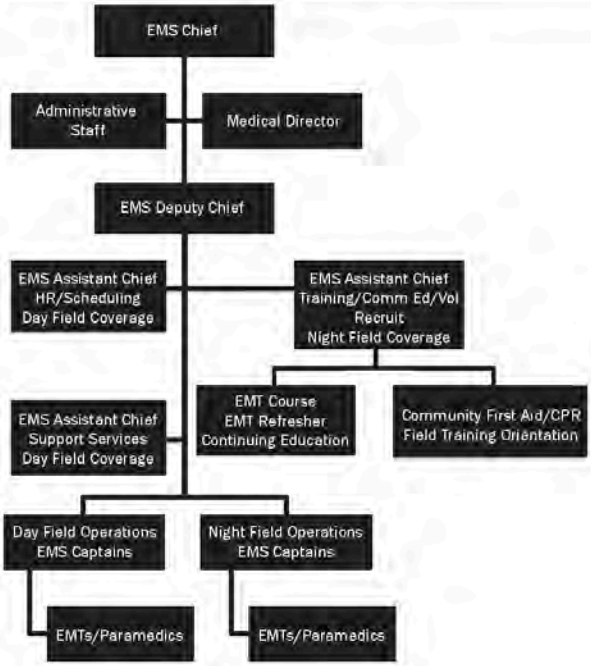
Memphis (TN) Fire Department
Single Agency Example



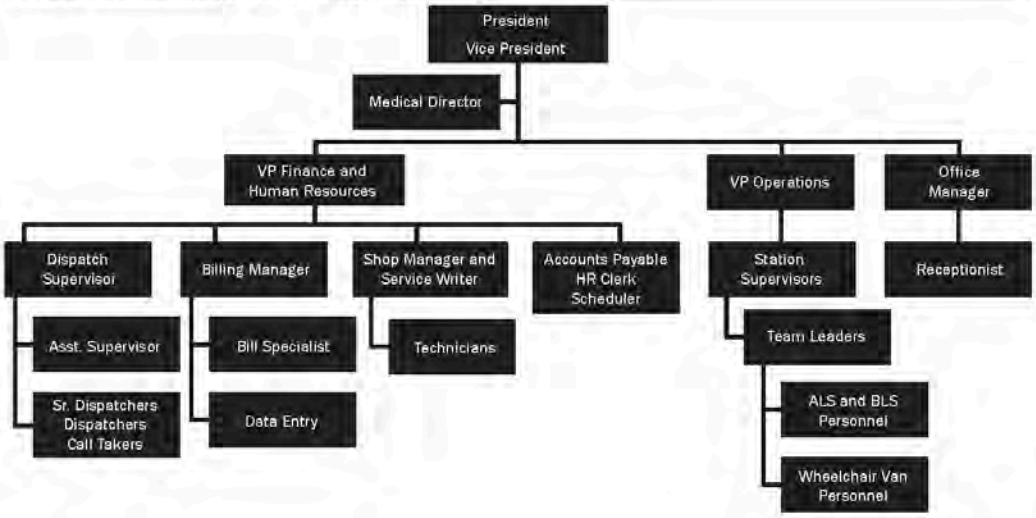
Montgomery County (MD) Fire and Rescue Service
Combination System Example



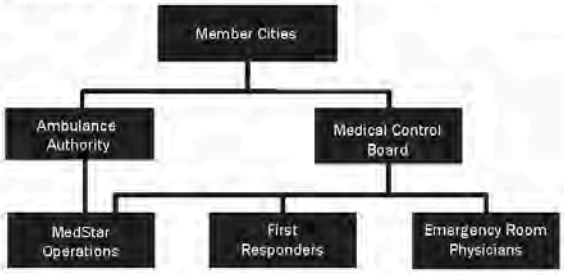
Town of Colonie (NY), Department of Emergency Medical Services
Third Service System



LifeCare Medical Transports (VA)
Private Ambulance (For Profit) Agency Example



Area Metropolitan Ambulance Authority, d/b/a MedStar (TX)
Public Utility Model Agency Example



Appendix E: Sample Affiliation Agreement

AGREEMENT

This agreement made this (date) the day of, (year) by and between (agency name) hereinafter called (name) and (name), M.D., (address), hereinafter called the "Contractor."

ARTICLE 1
BASIC AGREEMENTS

1.1. SCOPE OF SERVICES. The Contractor will serve as the (agency name) EMS Medical Director throughout the term of this Agreement. As the (agency name) EMS Medical Director, Contractor will:

A. Provide off-line medical direction services to include specification, review, and approval of the service protocols, quality improvement reviews, personnel evaluations for clinical fitness for duty/coverage by medical malpractice, advice to (agency name) EMS regarding EMS and medical direction, and other mutually agreed upon duties.

B. Review reports and run sheets for incidents.

C. Assist the EMS Director in setting up and evaluating a continuous quality improvement program in accordance with the state and federal regulations.

D. Participate in educational programs for (agency name) EMS.

E. Advise the EMS Director and the County (position title) on issues relating to the provision of quality emergency medical care by the agency's personnel.

F. Assist in the planning and implementation of new/expanded programs that promote the public welfare and the welfare of the agency's personnel.

G. Provide other medical advisory services related to the first responder program and other programs of the agency as necessary.

H. Assist in the coordination of research projects and their implementation to include the obtaining of grants.

1.2. TERM. This Agreement shall commence on (date) and expires on (date).

1.3. COMPENSATION. For the satisfactory performance of the duties enumerated above, (agency name) EMS shall pay Contractor the sum of (amount) per year; said amount shall be paid in twelve (12) equal monthly payments of (amount) each, payable by the 15th day of the month after services are rendered.

1.4. EFFECT OF CONTRACTOR'S DEATH. This Agreement shall terminate immediately upon the death of the Contractor, and upon the happening of that event, the agency shall not be liable for any payments under this Agreement occurring thereafter.

ARTICLE 2
HOLD HARMLESS AND INDEMNIFICATION

Contractor shall defend, indemnify and hold harmless (agency name) EMS, its agents and employees, and (jurisdiction) County, (State) from any and all liability and expenses to Contractor or any third parties for

claims, personal injuries, property damage, or loss of life or property resulting from, or in any way connected with, or alleged to have arisen from, the performance of this agreement, except where the proximate cause of such injury, damage, or loss was the sole negligence of (agency name) EMS, its agents or employees.

The Contractor shall defend, indemnify and hold (agency name) EMS, its agents and employees, and (jurisdiction) County, (state) harmless and pay all judgments that shall be rendered in any such actions, suits, claims or demands against same alleging liability referenced above, except where the proximate cause of such injury, damage or loss was the sole negligence of (agency name) EMS, its agents or employees, and (jurisdiction) County, (State).

ARTICLE 3
INSURANCE

Contractor will procure and maintain for the duration of this Agreement, Professional Liability Insurance, with a limit of not less than (amount), to cover claims for injuries to persons or damages to property which may arise from or in connection with the performance of this Agreement by the Contractor, his agents, representatives, employees or subcontractors. Additionally, Contractor will maintain automobile liability insurance for the duration of this Agreement.

ARTICLE 4
TERMINATION

Either party may cancel this Agreement, with or without cause, with a (number) day written notice to the other party. The parties are not obligated to perform or pay for any services pursuant to this Agreement after receipt of the notification of cancellation. The parties agree that this agreement is terminable at will. The parties agree that they shall not be entitled to any damages, claims, causes of action, judgment or demands in the event either party terminates this contract pursuant to this Article.

ARTICLE 5
NONDISCRIMATION

The Contractor:

5.1. Will not discriminate against any employee or applicant for employment because of race, age, color, religion, national origin, sex or disability.

5.2. Will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, age, color, religion, natural origin, sex or disability.

5.3. Will, in all solicitations or advertisements for employees placed by or on behalf of it, state that all qualified applicants will receive consideration for employment without regard to race, age, color, religion, national origin, sex or disability.

5.4. Will include these provisions in every subcontract or sublease let by or for him.

ARTICLE 6
ETHICAL STANDARDS

6.1. Contractor shall not participate, directly or indirectly, through decision, approval, disapproval, recommendation, preparation of any part of a purchase request, influencing the content of any specification or purchase standard, rendering advice, investigation, auditing or otherwise, in any proceed-

ing or application, request for ruling or other determination, claim or controversy or other matter pertaining to any contract or subcontract and any solicitation or proposal therefore, where to Contractor's knowledge there is a financial interest possessed by:

A. The contractor or the contractor's immediate family.

B. A business other than a public agency in which the contractor or a member of the contractor's immediate family serves as an officer, director, trustee, partner or employee.

C. Any other person or business with whom the director or a member of contractor's immediate family is negotiating or has an arrangement concerning prospective employment.

6.2. GRATUITIES. Contractor shall not solicit, demand, accept or agree to accept from another person or entity, anything of a pecuniary value for or because of:

A. An official action taken, or to be taken, or which could be taken by Contractor and/or such person or entity.

B. A legal duty performed, or to be performed, or which could be performed by Contractor and/or such person or entity.

C. A legal duty violated, or to be violated, or which could be violated by Contractor and/or such person or entity.

6.3. Anything of nominal value shall be presumed not to constitute a gratuity under this section.

6.4. KICKBACKS. Contractor shall at no time receive any payment, gratuity or benefit to be made by or on behalf of a subcontractor or any person associate therewith as an inducement for the award of a subcontract or order.

ARTICLE 7
RENEWAL OF AGREEMENT

This agreement shall automatically renew for additional terms of one (number) year each unless not less than ninety (number) days from the date of termination of this agreement either party gives notice in writing to the other that such party will not renew this agreement.

ARTICLE 8
MISCELLANEOUS PROVISIONS

8.1. Independent Contractor. The Contractor will render all services as an independent contractor; it will not be considered an employee of (agency name) EMS, nor will it be entitled to any benefits, insurance, pension, or workers' compensation as an employee of (agency name) EMS.

8.2. Assignment. The Contractor will not assign or transfer any interest in this agreement without obtaining the prior written approval of (agency name) EMS.

8.3. Subcontracts to the agreement. The Contractor will not enter into a subcontract for any of the services performed under this Agreement without obtaining the prior written approval of (agency name) EMS.

8.4. Written Amendments. This Agreement may be modified only by a written amendment or addendum which has been executed and approved by the appropriate officials shown on the signature page of this Agreement.

8.5. Required Approvals. Neither the Contractor nor (agency name) EMS is bound by this Agreement until it is approved by the appropriate officials shown on the signature page of this Agreement.

8.6. Article Captions. The captions appearing in this Agreement are for convenience only and are not a part of this Agreement; they do not in any way limit or amplify the provisions of this Agreement.

8.7. Severability. If any provision of this Agreement is determined to be unenforceable or invalid, such determination will not affect the validity of the other provisions contained in this Agreement. Failure to enforce any provision of this Agreement does not affect the rights of the parties to enforce such provision in another circumstance, nor does it affect the rights of the parties to enforce any other provision of this Agreement, at any time.

8.8. Federal, State and Local Requirements. The Contractor is responsible for full compliance with all applicable federal, state and local laws, rules and regulations.

8.9. Governing Law. This Agreement will be governed and construed in accordance with the laws of the State of (name), and proper venue for litigation concerning this agreement shall be in (jurisdiction) County, (state name).

8.10. Notices. All notices of either party to terminate this agreement shall be given in writing and sent by registered mail, addressed to the other party as herein provided. Notice to (agency name) EMS shall be given at the following address: (EMS agency address); notice to the Contractor shall be given at (address).

IN WITNESS WHEREOF, the parties have executed or caused to be executed this agreement on its behalf, the date and year first above written in duplicate originals.

_____EMS

by

_____
EMS official

_____
your name

Appendix F: Sample Liability Insurance Form

ACORD

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER	CONTACT NAME:
	PHONE (A/C, No, Ext): FAX (A/C, No):
	E-MAIL ADDRESS:
	INSURER(S) AFFORDING COVERAGE — NAIC #
INSURED	INSURER A :
	INSURER B :
	INSURER C :
	INSURER D :
	INSURER E :
	INSURER F :

COVERAGES — CERTIFICATE NUMBER: — REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSR	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
	GENERAL LIABILITY							
X	COMMERCIAL GENERAL LIABILITY						EACH OCCURRENCE	$ 1,000,000
	CLAIMS-MADE X OCCUR						DAMAGE TO RENTED PREMISES (Ea occurrence)	$ 100,000
X	ESIP Emerg Lia						MED EXP (Any one person)	$ 5,000
	Med Dir Malpr						PERSONAL & ADV INJURY	$ 1,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER						GENERAL AGGREGATE	$ 10,000,000
	POLICY PRO-JECT LOC						PRODUCTS - COMP/OP AGG	$ 10,000,000
								$
	AUTOMOBILE LIABILITY						COMBINED SINGLE LIMIT (Ea accident)	$
	ANY AUTO						BODILY INJURY (Per person)	$
	ALL OWNED AUTOS / SCHEDULED AUTOS						BODILY INJURY (Per accident)	$
	HIRED AUTOS / NON-OWNED AUTOS						PROPERTY DAMAGE (Per accident)	$
								$
	UMBRELLA LIAB X OCCUR						EACH OCCURRENCE	$ 5,000,000
	EXCESS LIAB CLAIMS-MADE						AGGREGATE	$ 5,000,000
	DED X RETENTION $ 0							$
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY						WC STATU-TORY LIMITS / OTH-ER	
	ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH)			N/A			E.L. EACH ACCIDENT	$
	If yes, describe under DESCRIPTION OF OPERATIONS below						E.L. DISEASE - EA EMPLOYEE	$
							E.L. DISEASE - POLICY LIMIT	$

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (Attach ACORD 101, Additional Remarks Schedule, if more space is required)

CERTIFICATE HOLDER	CANCELLATION
	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.
	AUTHORIZED REPRESENTATIVE

Sample

ACORD 25 (2010/05) The ACORD name and logo are registered marks of ACORD

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Appendix G: Industry Regulations and Standards

Occupational Safety and Health Administration

The two Occupational Safety and Health Administration (OSHA) regulations that govern emergency medical services (EMS) are found at Title 29 CFR § 1910.120: *Occupational Safety and Health Standards*; subparts (q)(6) (Hazardous waste operations and emergency response; and emergency response to hazardous substance releases). Each regulation deals with the level of responsibilities that EMS personnel have when responding to incidents involving hazardous substances, as well as the *Hazardous Waste Operations and Emergency Response* (HAZWOPER) training required.

The States and jurisdictions operating under OSHA covering both the private sector and State and local government employees are

- Alaska
- Arizona
- California
- Connecticut
- Hawaii
- Illinois
- Indiana
- Iowa
- Kentucky
- Maryland
- Michigan
- Minnesota
- Nevada
- New Mexico
- New Jersey
- New York
- North Carolina
- Oregon
- Puerto Rico
- South Carolina
- Tennessee
- Utah
- Vermont
- Virgin Islands
- Virginia
- Washington
- Wyoming

National Fire Protection Association

National Fire Protection Association (NFPA) 450, *Guide for Emergency Medical Services and Systems*, requires the coordination and cooperation of disparate elements. NFPA 450 is a document created to assist individuals, agencies, organizations, or systems, as well as those interested or involved in emergency medical services (EMS) agency design. It presents a practical framework of specific guidelines and recommendations that can be used to design and/or evaluate a comprehensive EMS agency.

NFPA 1500, *Standard on Fire Department Occupational Safety and Health Program*, addresses occupational safety in the working environment of the fire service and safety in the proper use of fire department vehicles, tools, equipment, protective clothing, and protective breathing apparatus.

NFPA 1584, *Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises*, provides for an organized approach for fire department members' rehabilitation during emergency operations and training exercises should be an integral component of both an occupational safety and health program and incident scene management. Document reflects current science and knowledge on rehabilitation of fire service members.

NFPA 1710, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, identifies the minimum requirements related to the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by substantially all career fire departments.

NFPA 1720, *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Volunteer Fire Departments*, identifies the minimum requirements relating to the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by volunteer and combination fire departments.

Dependent of the specialized functions an agency may provide, the following NFPA standards may be of additional interest to the medical director:

- NFPA 72, National Fire Alarm Code;
- NFPA 471, Recommended Practice for Responding to Hazardous Materials Incidents;
- NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents;
- NFPA 473, Standard for Competencies for EMS Personnel Responding to Hazardous Materials/Weapons of Mass Destruction Incidents;
- NFPA 1026, Standard for Incident Management Personnel Professional Qualifications;
- NFPA 1051, Standard for Wildland Fire Fighter Professional Qualifications;
- NFPA 1143, Standard for Wildland Fire Management;
- NFPA 1221, Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems;
- NFPA 1404, Standard for Fire Service Respiratory Protection Training;
- NFPA 1582, Standard on Comprehensive Occupational Medical Program for Fire Departments;
- NFPA 1583, Standard on Health-Related Fitness Programs for Fire Department Members;
- NFPA 1600, Standard on Disaster/Emergency Management and Business Continuity Programs;
- NFPA 1670, Standard on Operations and Training for Technical Search and Rescue Incidents;
- NFPA 1917, Standard for Automotive Ambulances; and
- NFPA 1999, Standard on Protective Clothing for Emergency Medical Operations.

American Society for Testing and Materials

The American Society for Testing and Materials (ASTM) International produces several standards related to EMS, the medical director, and emergency medical dispatcher (EMD). A sampling of standards is

- F1149-93 (2008), Standard Practice for Qualifications, Responsibilities, and Authority of Individuals and Institutions Providing Medical Direction of Emergency Medical Services;
- F1258-95 (2006), Standard Practice for Emergency Medical Dispatch;
- F1552-94 (2009), Standard Practice for Training Instructor Qualification and Certification Eligibility of Emergency Medical Dispatchers; and
- F1560-00 (2006), Standard Practice for Emergency Medical Dispatch Management.

Appendix H: Performance Measures

EMS Agency Performance Measures at a Glance: Example from International Association of Fire Fighters (IAFF)

Indicator	Definition of Indicator	Rationale Relating Measure to Agency Quality	Established Standard	Measure Type	Measure Status	Performance Goal	Performance Measure	Data Element Source
Call Processing	Time from call intake by dispatch agency until unit notification including answering phone (alarm), gathering vital information, and initiating a response by dispatching appropriate units.	Communication and dispatch component play major role in efficiency, agency deployment, and response. Communications component must be measured to assess individual operations quality.	NFPA 1221	Process	Core	95% of calls processed in less that 90 seconds	2.1 What percentage of all EMS calls is processed by the agency actually dispatching the responding unit in 90 seconds or less?	Dispatch Log, recorded communication archives, Dispatch administrator.
Turnout Time	Time from response unit notification to vehicle wheels rolling toward incident location. Includes personnel preparation for response, boarding responding apparatus/vehicle, placing the apparatus/vehicle in gear for response, wheels rolling toward the emergency scene.	The time from alert to wheels turning provides an indication of the state of readiness of personnel. Minimizing this time is crucial to an immediate response.	NFPA 1710	Process	Core	90% of all calls turned out in less than 60 seconds	2.2 What percentage of all EMS calls is turned out in 60 seconds or less?	Dispatch logs, Response Unit Station log, Recorded Communication Archives, Call reports.
Response Time	Timer from responding vehicle wheels rolling toward the address/incident until the arrival of the vehicle on scene at that address/incident location.	This measurement is indicative of the agency's capability to adequately staff, locate, and deploy response resources. It is also indicative of responding personnel's knowledge of the area or dispatcher instruction for efficient travel.	NFPA 1710	Process	Core	a. First responder with minimum of BLS capability = 90% in 4 minutes. b. Transport capable vehicle = 90% in 8 minutes. c. ALS capability = 90% in 8 minutes.	2.3a. What percentage of all EMS calls achieve first responding unit travel time of 4 minutes 0 seconds or less? 2.3b. What percentage of all EMS calls achieve transport unit travel time of 8 minutes 0 seconds or less? 2.3c. What percentage of all EMS call achieve ALS unit travel time of 8 minutes 0 seconds or less? 2.3d. Does the agency use Agency Status Management?	Dispatch logs, response Unit Station log, Computerized/ Recorded Communications Archive, Call documentation reports.

EMS Agency Performance Measures at a Glance: Example from International Association of Fire Fighters (IAFF) (continued)

Indicator	Definition of Indicator	Rationale Relating Measure to Agency Quality	Established Standard	Measure Type	Measure Status	Performance Goal	Performance Measure	Data Element Source
Staffing	The indicator includes both the number and level of training of personnel deployed on an emergency call.	The level of training of personnel deployed is indicative of the quality of the services delivered and therefore the agency. Anecdotally, two or more advanced personnel are considered higher quality than one.	NFPA 1710	Process	Core	Compliance with State regulations for staffing ALS transport units. Compliance with NFPA 1710 standards for staffing ALS response units.	2.4a. What percentage of ALS level calls receives a response including two EMTs and two paramedics? 2.4b. What percentage of BLS level calls receives a response including two EMTs?	Standard Operating Procedures (SOPs), Departmental Policy, Staffing Records.

Outcome-centered example from Myers et al., Prehosp Emerg Care. 2008; 12(2):141-51

(www.ncbi.nlm.nih.gov/pubmed/18379908)

Complaint/Disease process	Indicators
ST-segment elevation myocardial infarction (STEMI)	• Aspirin administered (if not allergic) • 12-lead electrocardiogram (ECG) performed with direct activation of interventional cardiology team • Direct transport to facility capable of emergent percutaneous coronary interventions
Pulmonary edema	• Nitroglycerin administered (if no contraindications) • Continuous positive airway pressure (CPAP) attempted before endotracheal intubation
Asthma	• Beta-agonist administered
Seizure	• Blood glucose measured • Benzodiazepine administered for status epilepticus
Trauma	• Scene time limited to <10 minutes (excluding entrapped time) • Direct transport to trauma center (or transfer to air transport) for patients meeting criteria
Cardiac arrest	• Response interval for CPR and defibrillator <5 minutes

Appendix I: Endnotes

[1] National Highway Traffic Safety Administration (NHTSA). 1996. "EMS Agenda for the Future." Washington, DC: Department of Transportation (DOT).

[2] Institute of Medicine. Committee on the Future of Emergency Care in the United States Health Agency. 2007. "Emergency Medical Services at the Crossroads." Washington, DC: National Academies Press.

[3] Eversole, J.M. 2003. The Fire Chief's Handbook (6th ed.). Tulsa: PennWell Corp.

[4] Ibid.

[5] National Registry of Emergency Medical Technicians—NREMT Milestones. 2008. Retrieved November 10, 2010, from website: nremt.org/nremt/about/nremtMilestones.asp

[6] Institute of Medicine. Committee on the Future of Emergency Care in the United States Health Agency. 2007. "Emergency Medical Services at the Crossroads." Washington, DC: National Academies Press.

[7] NHTSA. 1996. "EMS Agenda for the Future." Washington, DC: DOT.

[8] NHTSA. 2000. "EMS Education Agenda for the Future: A Systems Approach." Washington, DC: DOT.

[9] Institute of Medicine. Committee on the Future of Emergency Care in the United States Health Agency. 2007. "Emergency Medical Services at the Crossroads." Washington, DC: National Academies Press.

[10] Ibid.

[11] NHTSA. 2005. "National EMS Scope of Practice Model." Washington, DC: DOT.

[12] International Association of Fire Fighters (IAFF). Emergency Medical Services: A Guidebook for Fire-Based Agencies. (4th ed.). Retrieved April 29, 2010, from website: www.iaff.org/Tech/PDF/EMSGuideBk.pdf

[13] Institute of Medicine. Committee on the Future of Emergency Care in the United States Health Agency. 2007. "Emergency Medical Services at the Crossroads." Washington, DC: National Academies Press.

[14] Ibid.

[15] American College of Emergency Physicians. "Policy Statement: Medical Direction of Emergency Medical Services." 2005. Retrieved April 29, 2010, from website: www.acep.org/practres.aspx?id=29570

[16] National Association of EMS Physicians. 2002. "Prehospital Agency and Medical Oversight" (3rd ed.). Dubuque: Kendall/Hunt Pub. 441-460.

[17] Sanders, M.J., Lewis, L., and Quick, Gary. 2007. Paramedic Text Book (Rev. 3rd ed.). St. Louis, MO: Elsevier Mosby Inc.

[18] Ibid.

[19] American College of Emergency Physicians. "Policy Statement: Direction of Out-of-Hospital Care at the Scene of Medical Emergencies." Retrieved May 26, 2010, from website: www.acep.org/practres.aspx?id=29170cuments/

[20] NHTSA. "National Emergency Medical Services Educational Standards." Retrieved September 2, 2010, from website: www.ems.gov/pdf/811077a.pdf

[21] The Continuing Education Coordinating Board for Emergency Medical Services (CECBEMS). "Frequently Asked Questions." Retrieved on September 2, 2010, from website: www.cecbems.org/faqAnswers

[22] NHTSA. "A Leadership Guide to Quality Improvement in Emergency Medical Services Agencies." Retrieved on May 23, 2010, from website: www.nhtsa.gov/people/injury/ems/leaderguide/index.html

[23] Evans, B.E., and Dyar, J.T. 2010. "Management of EMS." Upper Saddle River, NJ: Pearson Education, Inc. 8-21.

[24] National Association of State Emergency Medical Services Directors (NASEMSD), National Association of EMS Physicians (NAEMSP), and American College of Emergency Physicians (ACEP). "The Role of State Medical Direction in the Comprehensive Emergency Medical Services Agency." Retrieved on April 26, 2010, from website: www.acep.org/workarea/showcontent.aspx?id=4850

[25] American Academy of Orthopedic Surgeons. 2006. "Emergency Care and Transportation of the Sick and Injured." (9th ed.). Sudbury, MA: Jones & Bartlett Publishers.

[26] Dave, G., and Parmar, K. 2001. "Emergency Medical Services and Disaster Management: A Holistic Approach." (1st ed.). New Delhi, India: Jaypee Brothers Medical Publishers, Ltd.

[27] Ibid.

[28] Six Sigma Online. "Why Six Sigma?" Retrieved on April 22, 2011, from website: www.sixsigmaonline.org/q1.html

[29] Lee County EMS. "Lee County EMS and the Implementation of Six Sigma." Retrieved on September 1, 2010, from website: home.safelee.org/public/sixsigma/

[30] IAFF and International Association of Fire Chiefs (IAFC). "EMS System Performance Measurement." Retrieved on November 10, 2010, from website: www.iaff.org/tech/PDF/EMSSystemPerformanceMeasurement.pdf

[31] Ibid.

[32] Hatley T. "Using Data in Quality Management." NAEMSP, Vol. 3. Retrieved on September 1, 2010, from website: www.naemsp.org/newsletters.html

[33] Touchstone, M. (2009, January). "EMS in America: The Foundation Documents." EMS1.com. Retrieved on August 28, 2010, from website: www.ems1.com/ems-products/education/articles/584788-EMS-in-America-The-Foundation-Documents/

[34] The Commission on Accreditation of Ambulance Services (CAAS). "Welcome to CAAS." Retrieved on August 26, 2010, from website: www.caas.org/

[35] Prehospital Care Research Forum. "EMS Research." Retrieved on September 4, 2010, from website: www.pcrf.mednet.ucla.edu/pcrf/pdf4.pdf

[36] Federal Emergency Management Agency (FEMA). "Standard Details." 29 CFR Part 634 – Worker Visibility. Retrieved on August 31, 2010, from website: www.rkb.us/contentdetail.cfm?content_id=200622

[37] Goodson, C. 2001. "Principles of Vehicle Extrication" (2nd ed.). Oklahoma City: Fire Protection Publications, Oklahoma State University.

[38] Commission on Accreditation of Allied Health Education Programs. "Standards and Guidelines." Retrieved on August 26, 2010, from website: www.coaemsp.org/Documents/Standards.pdf

[39] NHTSA. "EMS Workforce for the 21st Century: A National Assessment." Retrieved on August 28, 2010, from website: www.nhtsa.gov/people/injury/ems/EMSUpdateFall/pages/page5.htm

[40] Kearns, C. (2007, August). "Monitor Your Budget on a Daily Basis." EMS World. Retrieved on August 28, 2010, from website: www.emsresponder.com/publication/article.jsp?pubId=1&id=6002&submit_comment=y#commentform

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Appendix B: Cost of Basic Life Support Equipment and Supplies

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Equipment	Size or Type	Unit Price	Count	Sub-Total
Suction				
Portable Automatic Suction unit		$ 1,154.00	1	$ 1,154.00
1200 cc Suction Canister with Lid		$ 5.79	2	$ 11.58
Yankauer Suction Tip and Tubing No vent, Bulb Tip		$ 3.57	2	$ 7.14
Suction Catheters	6 FR	$ 0.69	1	$ 0.69
Suction Catheters	8 Fr	$ 0.69	1	$ 0.69
Suction Catheters	10 FR	$ 0.69	1	$ 0.69
Suction Catheters	12 FR	$ 0.69	1	$ 0.69
Suction Catheters	14 FR	$ 0.69	1	$ 0.69
Suction Catheters	16 FR	$ 0.69	1	$ 0.69
Bulb Suction	2 oz.	$ 1.43	1	$ 1.43
Saline drops	30 mL, 40/box	$ 43.59	2	$ 87.18
Oxygen and Delivery				
"D" Aluminum with Toggle Valve		$ 80.99	2	$ 161.98
Variable Flow Regulator 1 DISS Outlet and 1 Barb		$ 142.10	2	$ 284.20
Non-Rebreather 7' tubing	Adult	$ 1.86	3	$ 5.58
Non-Rebreather 7' tubing	Pediatric	$ 2.29	3	$ 6.87
Rebreather 7' tubing ◊	Adult	$ 1.86	0	$ -
Rebreather 7' tubing ◊	Pediatric	$ 2.39	0	$ -
Nasal Cannula with Flared Tip 7' tubing	Adult	$ 0.59	3	$ 1.77
Nasal cannula 7' tubing ◊	Pediatric	$ 0.89	0	$ -
Bag Valve Mask	Infant	$ 19.55	2	$ 39.10
Bag Valve Mask	Pediatric	$ 19.55	2	$ 39.10
Bag Valve Mask	Adult	$ 14.76	2	$ 29.52
Nasopharyngeal Airways	20 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	22 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	24 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	26 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	28 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	30 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	32 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	34 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	36 FR	$ 4.48	1	$ 4.48

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	Sub-Total
Oxygen and Delivery Continued				
Oropharyngeal Airways	#5.5, 55 mm Infant	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#6, 60 mm Child	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#7, 70 mm, Child	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#8, 80 mm, Small Adult	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#9, 90 mm Small/Medium Adult	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#10, 100 mm, Medium Adult	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#11, 110mm, Adult	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#12, 120 mm Large Adult	$ 1.69	1	$ 1.69
Pulse Oximeter		$ 598.00	1	$ 598.00
Sensor	Adult	$ 193.45	1	$ 193.45
Sensor	Pediatric	$ 193.45	1	$ 193.45
Sensor ◊	ear Clip	$ 205.64	0	$ -
Sensor	Disposable pediatric and neonate	$ 22.25	1	$ 22.25
Carrying Case		$ 70.00	1	$ 70.00
Monitoring and Defibrillation				
Defib/Pacing/ECG Pads w/quick connector 2 ft.	Adult	$ 56.91	2	$ 113.82
Prep Razor individual		$ 0.79	4	$ 3.16
AED carrying case included		$ 2,595.00	1	$ 2,595.00
AED pediatric step down Defib pads	Pediatric	$ 127.20	1	$ 127.20

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
Immobilization Devices				
C-Collar	Infant	$ 7.25	1	$ 7.25
C-Collar	Pediatric	$ 7.25	1	$ 7.25
C-Collar	Neckless	$ 7.25	2	$ 14.50
C-Collar	Short	$ 7.25	2	$ 14.50
C-Collar	Regular	$ 7.25	2	$ 14.50
C-Collar	Tall	$ 7.25	2	$ 14.50
Head Immobilizer: 2 Support Pads, Head, Chin Strap, and Base		$ 99.95	2	$ 199.90
Hare Traction splint	Adult	$ 344.00	1	$ 344.00
Hare Traction splint	Pediatric	$ 344.00	1	$ 344.00
Vacuum splints kit		$ 515.95	1	$ 515.95
Backboard with Pins		$ 252.88	2	$ 505.76
Backboard Straps	5', 2 piece with swivel quick clips, Nylon	$ 17.75	6	$ 106.50
Infant/Pediatric Immobilization Board with case		$ 446.69	1	$ 446.69
D-ring Disposable Limb Restraints	2 per package	$ 6.03	2	$ 12.06
Scoop Stretcher		$ 828.50	1	$ 828.50
KED		$ 217.90	1	$ 217.90
Reeves Stretcher		$ 304.95	1	$ 304.95
Bandages				
Burn Towels	12'"X12"	$ 6.63	1	$ 6.63
Burn Towels	15"X20"	$ 9.11	1	$ 9.11
Burn Towels	20"X30"	$ 12.19	1	$ 12.19
Burn Towels	Face Mask	$ 9.53	1	$ 9.53
Burn Towels	58"X84"	$ 47.69	1	$ 47.69
Triangular Bandages	36"X36"x51"	$ 1.00	2	$ 2.00
Multi-Trauma Dressing		$ 4.99	4	$ 19.96
ABD pads 20/box	8"X10"	$ 6.00	8	$ 48.00
4X4 12 ply	100/ box	$ 9.11	1	$ 9.11
Gauze Rolls	4"x4 yards 12/box	$ 13.89	1	$ 13.89
Gauze Rolls	2"X 4 yards 12/box	$ 9.60	1	$ 9.60
Band-Aids	1"X3" 100/box	$ 7.10	1	$ 7.10
Occlusive Dressing	With Valve	$ 22.50	2	$ 45.00
Occlusive Dressing	Without Valve	$ 27.95	2	$ 55.90
Transpore Surgical Tape	1" X 10 yards 12 rolls/box	$ 21.62	1	$ 21.62
Transpore Surgical Tape ◊	2" X 10 yards 6 rolls/box	$ 21.62	0	$ -
Arterial Tourniquet		$ 38.00	2	$ 76.00

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
Communication				
Will require the use of cellular devices and radios.				
Obstetrical Kit				
OB Kit		$ 13.65	2	$ 27.30
Foil Baby Bunting ◊ included in kit		$ 5.95	0	$ -
Miscellaneous				
Sphygmomanometer	Infant	$ 34.75	1	$ 34.75
Sphygmomanometer	Child	$ 34.75	1	$ 34.75
Sphygmomanometer	Adult	$ 34.75	1	$ 34.75
Sphygmomanometer	Large Adult	$ 42.59	1	$ 42.59
Sphygmomanometer	Thigh	$ 46.95	1	$ 46.95
Stethoscope	Adult	$ 97.10	1	$ 97.10
Stethoscope ◊	Pediatric	$ 117.59	1	$ 117.59
Digital Hypothermia Thermometer	78° F- 111.9° F	$ 11.50	1	$ 11.50
Thermometer Sheaths	100/ box	$ 4.59	1	$ 4.59
Trauma Shears		$ 6.49	2	$ 12.98
Instant Cold Compress	24/Case	$ 22.99	4	$ 91.96
Irrigation Solution	Sterile water 1000 mL	$ 3.87	4	$ 15.48
Irrigation Solution	NaCl 0.9% 1000 mL	$ 4.23	0	$ -
Pen Light (Disposable)	6/pack	$ 8.12	1	$ 8.12
Blanket ◊: Normally provided by Hospital		$ 14.09	0	$ -
Linen Pack ◊ : Normally provided by the hospital	Disposable with pillow case, flat sheet and heavy duty fitted sheet 25/case	$ 85.86	0	$ -
Towels ◊ : Normally provided by the hospital	16"X27"	$ 64.99	0	$ -
Triage Tags	50/bag	$ 64.13	1	$ 64.13
Emesis Bags		$ 2.07	4	$ 8.28
Disposable Bed Pan ◊		$ 2.63	0	$ -
Disposable Urinal ◊		$ 0.97	0	$ -
Water Based Sterile Lubricant	144/case	$ 13.67	1	$ 13.67

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	
Infection Control				
Safety glasses		$ 13.44	2	$ 26.88
Face Protection	with fluid shield 25/box	$ 41.03	4	$ 164.12
Face Protection	surgical mask without fluid shield, with ear loops 50/box	$ 15.95	4	$ 63.80
Nitrile Gloves	Small 100/box	$ 15.06	2	$ 30.12
Nitrile Gloves	Medium 100/box	$ 15.06	2	$ 30.12
Nitrile Gloves	Large 100/box	$ 15.06	2	$ 30.12
Nitrile Gloves	X-Large 100/box	$ 15.06	2	$ 30.12
Nitrile Gloves	XX-Large 90/box	$ 15.06	2	$ 30.12
Coveralls	Medium	$ 7.70	2	$ 15.40
Coveralls	Large	$ 7.70	2	$ 15.40
Coveralls	X-Large	$ 7.70	2	$ 15.40
Coveralls	XX-Large	$ 7.70	2	$ 15.40
Boot Covers	Universal Size	$ 2.96	2	$ 5.92
Personal Protection Kit		$ 8.40	2	$ 16.80
Waterless Hand Sanitizer		$ 2.32	2	$ 4.64
Cavicide	24 OZ Spray bottle	$ 13.38	1	$ 13.38
Sharps Container	1 Quart	$ 4.25	1	$ 4.25
Sharps Container	5 quart	$ 5.18	2	$ 10.36
Bio-Hazard Bags	5 gal 12"X15"	$ 0.47	4	$ 1.88
Standard Trash Bags	wastebasket 500/box	$ 17.05	1	$ 17.05
N95 respirators **MUST** be fit tested and are not necessarily required				
N95 respirator with nose flange	X-Small, 20/box	$ 27.70	1	$ 27.70
N95 respirator with nose flange	Small, 20/box	$ 27.70	1	$ 27.70
N95 respirator with nose flange	Medium, 20/box	$ 27.70	1	$ 27.70
N95 respirator with nose flange	Large, 20/box	$ 27.70	1	$ 27.70
N95 Fit Test Kit		$ 276.65	1	$ 276.65
N95 Fit Test Hood		$ 59.70	1	$ 59.70
N95 Fit Test Nebulizer #1		$ 99.52	1	$ 99.52
N95 Fit Test Nebulizer #2		$ 99.52	1	$ 99.52
Bitrex Test Solution	6 vials/box	$ 14.28	1	$ 14.28
Bitrex Threshold Screening Solution	6 vials/box	$ 14.28	1	$ 14.28
Injury Prevention Equipment				
Car Seat-Refer to NHTSA.gov for a list of EMS Approved Child Occupant protection devices				
Emergency Response Guide		$ 3.69	1	$ 3.69
Highway safety warning triangles	3/box	$ 34.78	1	$ 34.78
International Safety Vest	Universal Size	$ 19.87	2	$ 39.74

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
Airway				
Secondary, Blind Insertion device	Assorted Sizes	$ 41.85	1	$ 41.85
Other Advanced Equipment				
Glucometer Note: Most distributors will give glucometers away for free on request if purchasing test strips, ask distributor for details		$ 47.49	1	$ 47.49
Glucometer test strips	capillary blood 50/box	$ 50.95	1	$ 50.95
Lancets	100/box	$ 17.68	1	$ 17.68
Medications				
Oxygen Price will vary depending on amount and method of purchase				
Oral Glucose	3 tubes/ pack 15 gm	$ 14.72	1	$ 14.72
NaCl 0.9% flushes	10 mL	$ 1.05	4	$ 4.20
Epi-Pen Auto-Injector ◊		$ 295.55	0	$ -
DuoDote Auto-Injector		$ 62.52	2	$ 125.04
Other Necessary Equipment				
First In Bag		$ 418.97	1	$ 418.97
Trauma Bag ◊		$ 187.00	1	$ 187.00
C-collar Bag		$ 69.55	1	$ 69.55
clip board Needed if doing paper reporting		$ 42.84	0	$ -
Paper reports prices will vary depending on a number of factors, contact a printer				
Panasonic Tough Book Needed for electronic reporting		$ 4,500.00	1	$ 4,500.00
Software cost may be free to have attached cost, contact vendor for details				
Hardware may be included contact vendor for details				
Seals	100/pack	$ 29.39	1	$ 29.39
◊ Indicates optional equipment included in cost figure			Sub-Total	$ 17,563.37

Equipment	Size or Type	Unit Price	Count	Sub-Total
Optional				
CPAP ◊	Generator, fixed flow	$ 525.00	1	$ 525.00
CPAP ◊	procedure Kit 10 cm H2O 10/case	$ 624.72	2	$ 1,249.44
◊ Indicates optional equipment included in cost figure			Sub-Total	$ 1,774.44
			TOTAL	**$ 19,337.81**

Notes:

- It is assumed that the agency will be using a Computer based reporting (ePCR) system. Prices of software and hardware may vary depending on the billing agency used or subcontractor that is supplying software and/or equipment.
- The prices selected for this estimated represent median list prices, there could be variation within cost by purchasing in bulk or choosing cheaper supplies. Additionally there are a limited number of supplies that could serve a dual role in patient care and can eliminate redundancies n purchasing, for example certain varieties of bulky trauma dressings can also be used as burn sheets and dressings as per manufacturer claims.
- MAST trousers are not included in this estimate.
- Patient handling devices such as cots, stair chairs or lifting devices are not included here, but are in the body of the report in Ambulance cost.

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Appendix C: Cost of Advanced Life Support Equipment and Supplies

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Equipment	Size or Type	Unit Price	Count	Sub-Total
Suction				
Portable Automatic Suction unit		$ 1,154.00	1	$ 1,154.00
1200 cc Suction Canister with Lid		$ 5.79	2	$ 11.58
Yankauer Suction Tip and Tubing No vent, Bulb Tip		$ 3.57	2	$ 7.14
Suction Catheters	6 FR	$ 0.69	1	$ 0.69
Suction Catheters	8 Fr	$ 0.69	1	$ 0.69
Suction Catheters	10 FR	$ 0.69	1	$ 0.69
Suction Catheters	12 FR	$ 0.69	1	$ 0.69
Suction Catheters	14 FR	$ 0.69	1	$ 0.69
Suction Catheters	16 FR	$ 0.69	1	$ 0.69
Bulb Suction	2 oz.	$ 1.43	1	$ 1.43
Saline drops	30 mL, 40/box	$ 43.59	2	$ 87.18
Oxygen and Delivery				
"D" Aluminum with Toggle Valve		$ 80.99	2	$ 161.98
Variable Flow Regulator 1 DISS Outlet and 1 Barb		$ 142.10	2	$ 284.20
Non-Rebreather 7' tubing	Adult	$ 1.86	3	$ 5.58
Non-Rebreather 7' tubing	Pediatric	$ 2.29	3	$ 6.87
Rebreather 7' tubing ◊	Adult	$ 1.86	0	$ -
Rebreather 7' tubing ◊	Pediatric	$ 2.39	0	$ -
Nasal Cannula with Flared Tip 7' tubing	Adult	$ 0.59	3	$ 1.77
Nasal cannula 7' tubing ◊	Pediatric	$ 0.89	0	$ -
Bag Valve Mask	Infant	$ 19.55	2	$ 39.10
Bag Valve Mask	Pediatric	$ 19.55	2	$ 39.10
Bag Valve Mask	Adult	$ 14.76	2	$ 29.52
Nasopharyngeal Airways	20 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	22 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	24 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	26 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	28 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	30 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	32 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	34 FR	$ 4.48	1	$ 4.48
Nasopharyngeal Airways	36 FR	$ 4.48	1	$ 4.48

◊ Indicates an optional piece or equipment

Equipment	Size or Type	Unit Price	Count	Sub-Total
Oropharyngeal Airways	#5.5, 55 mm Infant	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#6, 60 mm Child	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#7, 70 mm, Child	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#8, 80 mm, Small Adult	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#9, 90 mm Small/Medium Adult	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#10, 100 mm, Medium Adult	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#11, 110mm, Adult	$ 1.69	1	$ 1.69
Oropharyngeal Airways	#12, 120 mm Large Adult	$ 1.69	1	$ 1.69
Pulse Oximeter		$ 598.00	1	$ 598.00
Sensor	Adult	$ 193.45	1	$ 193.45
Sensor	Pediatric	$ 193.45	1	$ 193.45
Sensor ◊	ear Clip	$ 205.64	0	$ -
Sensor	Disposable pediatric and neonate	$ 22.25	1	$ 22.25
Carrying Case		$ 70.00	1	$ 70.00
Monitoring and Defibrillation				
Monitor with Masimo SpO2, SpCO, SpMET, NIBP, 12-Lead ECG, EtCO2, Bluetooth, Trending		$ 36,595.00	1	$ 36,595.00
Battery Charger		$ 1,725.00	1	$ 1,725.00
Carrying Case		$ 268.00	1	$ 268.00
Li-ion battery		$ 400.00	3	$ 1,200.00
Defib/Pacing/ECG Pads w/quick connector 2 ft.	Adult	$ 56.91	2	$ 113.82
Defib/Pacing/ECG Pads w/quick connector 2 ft.	Pediatric	$ 64.27	1	$ 64.27
Ambu Blue Sensor electrodes 25/pack	Adult	$ 11.59	2	$ 23.18
Pediatric Electrodes 3/strip 10 strips/box	Pediatric	$ 11.99	1	$ 11.99
Monitor paper 3/pack		$ 15.49	1	$ 15.49
Prep Razor individual		$ 0.79	4	$ 3.16
AED ◊ if ALS unit		$ 2,595.00	0	$ -
AED pediatric step down Defib pads ◊ if ALS unit	Pediatric	$ 127.20	0	$ -

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
Immobilization Devices				
C-Collar	Infant	$ 7.25	1	$ 7.25
C-Collar	Pediatric	$ 7.25	1	$ 7.25
C-Collar	Neckless	$ 7.25	2	$ 14.50
C-Collar	Short	$ 7.25	2	$ 14.50
C-Collar	Regular	$ 7.25	2	$ 14.50
C-Collar	Tall	$ 7.25	2	$ 14.50
Head Immobilizer: 2 Support Pads, Head, Chin Strap, and Base		$ 99.95	2	$ 199.90
Hare Traction splint	Adult	$ 344.00	1	$ 344.00
Hare Traction splint	Pediatric	$ 344.00	1	$ 344.00
Vacuum splints kit		$ 515.95	1	$ 515.95
Backboard with Pins		$ 252.88	2	$ 505.76
Backboard Straps	5', 2 piece with swivel quick clips, Nylon	$ 17.75	6	$ 106.50
Infant/Pediatric Immobilization Board with case		$ 446.69	1	$ 446.69
D-ring Disposable Limb Restraints	2 per package	$ 6.03	2	$ 12.06
Scoop Stretcher		$ 828.50	1	$ 828.50
KED		$ 217.90	1	$ 217.90
Reeves Stretcher		$ 304.95	1	$ 304.95
Bandages				
Burn Towels	12'"X12"	$ 6.63	1	$ 6.63
Burn Towels	15"X20"	$ 9.11	1	$ 9.11
Burn Towels	20"X30"	$ 12.19	1	$ 12.19
Burn Towels	Face Mask	$ 9.53	1	$ 9.53
Burn Towels	58"X84"	$ 47.69	1	$ 47.69
Triangular Bandages	36"X36"x51"	$ 1.00	2	$ 2.00
Multi-Trauma Dressing		$ 4.99	4	$ 19.96
ABD pads 20/box	8"X10"	$ 6.00	8	$ 48.00
4X4 12 ply	100/ box	$ 9.11	1	$ 9.11
Gauze Rolls	4"x4 yards 12/box	$ 13.89	1	$ 13.89
Gauze Rolls	2"X 4 yards 12/box	$ 9.60	1	$ 9.60
Band-Aids	1"X3" 100/box	$ 7.10	1	$ 7.10
Occlusive Dressing	With Valve	$ 22.50	2	$ 45.00
Occlusive Dressing	Without Valve	$ 27.95	2	$ 55.90
Transpore Surgical Tape	1" X 10 yards 12 rolls/box	$ 21.62	1	$ 21.62
Transpore Surgical Tape ◊	2" X 10 yards 6 rolls/box	$ 21.62	0	$ -
Arterial Tourniquet		$ 38.00	2	$ 76.00

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
Communication				
Will require the use of cellular devices and radios.				
Obstetrical Kit				
OB Kit		$ 13.65	2	$ 27.30
Foil Baby Bunting optional included in kit		$ 5.95	0	$ -
Miscellaneous				
Sphygmomanometer	Infant	$ 34.75	1	$ 34.75
Sphygmomanometer	Child	$ 34.75	1	$ 34.75
Sphygmomanometer	Adult	$ 34.75	1	$ 34.75
Sphygmomanometer	Large Adult	$ 42.59	1	$ 42.59
Sphygmomanometer	Thigh	$ 46.95	1	$ 46.95
Stethoscope	Adult	$ 97.10	1	$ 97.10
Stethoscope ◊	Pediatric	$ 117.59	1	$ 117.59
Pediatric Drug Chart		$ 14.69	1	$ 14.69
Digital Hypothermia Thermometer	78° F- 111.9° F	$ 11.50	1	$ 11.50
Thermometer Sheaths	100/ box	$ 4.59	1	$ 4.59
Trauma Shears		$ 6.49	2	$ 12.98
Instant Cold Compress	24/Case	$ 22.99	4	$ 91.96
Irrigation Solution	Sterile water 1000 mL	$ 3.87	4	$ 15.48
Irrigation Solution	NaCl 0.9% 1000 mL	$ 4.23	4	$ 16.92
Pen Light (Disposable)	6/pack	$ 8.12	1	$ 8.12
Blanket ◊: Normally provided by Hospital		$ 14.09	0	$ -
Linen Pack ◊ : Normally provided by the hospital	Disposable with pillow case, flat sheet and heavy duty fitted sheet 25/case	$ 85.86	0	$ -
Towels ◊ : Normally provided by the hospital	16"X27"	$ 64.99	0	$ -
Triage Tags	50/bag	$ 64.13	1	$ 64.13
Emesis Bags		$ 2.07	4	$ 8.28
Disposable Bed Pan ◊		$ 2.63	0	$ -
Disposable Urinal ◊		$ 0.97	0	$ -
Water Based Sterile Lubricant	144/case	$ 13.67	1	$ 13.67

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
Infection Control				
Safety glasses		$ 13.44	2	$ 26.88
Face Protection	with fluid shield 25/box	$ 41.03	4	$ 164.12
Face Protection	surgical mask without fluid shield, with ear loops 50/box	$ 15.95	4	$ 63.80
Nitrile Gloves	Small 100/box	$ 15.06	2	$ 30.12
Nitrile Gloves	Medium 100/box	$ 15.06	2	$ 30.12
Nitrile Gloves	Large 100/box	$ 15.06	2	$ 30.12
Nitrile Gloves	X-Large 100/box	$ 15.06	2	$ 30.12
Nitrile Gloves	XX-Large 90/box	$ 15.06	2	$ 30.12
Coveralls	Medium	$ 7.70	2	$ 15.40
Coveralls	Large	$ 7.70	2	$ 15.40
Coveralls	X-Large	$ 7.70	2	$ 15.40
Coveralls	XX-Large	$ 7.70	2	$ 15.40
Boot Covers	Universal Size	$ 2.96	2	$ 5.92
Personal Protection Kit		$ 8.40	2	$ 16.80
Waterless Hand Sanitizer		$ 2.32	2	$ 4.64
Cavicide	24 OZ Spray bottle	$ 13.38	1	$ 13.38
Sharps Container	1 Quart	$ 4.25	1	$ 4.25
Sharps Container	5 quart	$ 5.18	2	$ 10.36
Bio-Hazard Bags	5 gal 12"X15"	$ 0.47	4	$ 1.88
Standard Trash Bags	wastebasket 500/box	$ 17.05	1	$ 17.05
N95 respirators **MUST** be fit tested and are not necessarily required				
N95 respirator with nose flange	X-Small, 20/box	$ 27.70	1	$ 27.70
N95 respirator with nose flange	Small, 20/box	$ 27.70	1	$ 27.70
N95 respirator with nose flange	Medium, 20/box	$ 27.70	1	$ 27.70
N95 respirator with nose flange	Large, 20/box	$ 27.70	1	$ 27.70
N95 Fit Test Kit		$ 276.65	1	$ 276.65
N95 Fit Test Hood		$ 59.70	1	$ 59.70
N95 Fit Test Nebulizer #1		$ 99.52	1	$ 99.52
N95 Fit Test Nebulizer #2		$ 99.52	1	$ 99.52
Bitrex Test Solution	6 vials/box	$ 14.28	1	$ 14.28
Bitrex Threshold Screening Solution	6 vials/box	$ 14.28	1	$ 14.28
Injury Prevention Equipment				
Car Seat-Refer to NHTSA.gov for a list of EMS Approved Child Occupant protection devices				
Emergency Response Guide		$ 3.69	1	$ 3.69
Highway safety warning triangles	3/box	$ 34.78	1	$ 34.78
International Safety Vest	Universal Size	$ 19.87	2	$ 39.74

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
REQUIRED ALS EQUIPMENT				
Laryngoscope Handle	Small or Medium	$ 59.94	2	$ 119.88
"C" batteries for Adult Handle	each	$ 1.45	2	$ 2.90
"AA" batteries for Pediatric Handle	each	$ 0.79	2	$ 1.58
Laryngoscope Blade Disposable Metal	0 Miller	$ 7.41	1	$ 7.41
Laryngoscope Blade Disposable Metal	1 Miller	$ 7.41	1	$ 7.41
Laryngoscope Blade Disposable Metal	2 Miller	$ 7.41	1	$ 7.41
Laryngoscope Blade Disposable Metal	3 Miller	$ 7.41	1	$ 7.41
Laryngoscope Blade Disposable Metal	4 Miller	$ 7.41	1	$ 7.41
Laryngoscope Blade Disposable Metal	2 MacIntosh	$ 7.41	1	$ 7.41
Laryngoscope Blade Disposable Metal	3 MacIntosh	$ 7.41	1	$ 7.41
Laryngoscope Blade Disposable Metal	4 MacIntosh	$ 7.41	1	$ 7.41
Uncuffed Endotracheal Tubes	2.5 mm	$ 1.95	2	$ 3.90
Uncuffed Endotracheal Tubes	3.0 mm	$ 1.95	2	$ 3.90
Uncuffed Endotracheal Tubes	3.5 mm	$ 1.95	2	$ 3.90
Uncuffed Endotracheal Tubes	4.0 mm	$ 1.95	2	$ 3.90
Uncuffed Endotracheal Tubes	4.5 mm	$ 1.95	2	$ 3.90
Uncuffed Endotracheal Tubes	5.0 mm	$ 1.95	2	$ 3.90
Uncuffed Endotracheal Tubes	5.5 mm	$ 1.95	2	$ 3.90
Cuffed Endotracheal Tubes	6.0 mm	$ 1.95	2	$ 3.90
Cuffed Endotracheal Tubes	7.0 mm	$ 1.95	2	$ 3.90
Cuffed Endotracheal Tubes	8.0 mm	$ 1.95	2	$ 3.90
Meconium Aspirator		$ 6.81	1	$ 6.81
10 cc syringe		$ 0.20	2	$ 0.40
stylette	6 FR (2.0-3.5 mm) 30 cm long	$ 3.04	1	$ 3.04
stylette	10 FR (4.0-6.5mm) 44 cm Long	$ 3.04	1	$ 3.04
stylette	14 FR (7.0-10mm) 45 cm long	$ 3.04	1	$ 3.04
Endotracheal Tube Holder	Adult and Pediatric sizes	$ 4.00	2	$ 8.00
Magill Forceps	Adult	$ 6.43	1	$ 6.43
Magill Forceps	Pediatric	$ 6.43	1	$ 6.43

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
REQUIRED ALS EQUIPMENT				
Intubation Detection Device	Syringe or Bulb	$ 9.12	1	$ 9.12
End tidal CO2 Detection	Colorimetric Adult	$ 12.89	2	$ 25.78
End tidal CO2 Detection	Colorimetric Pediatric	$ 12.89	1	$ 12.89
End tidal CO2 Detection	Capnoline Pediatric non-intubated	$ 13.94	1	$ 13.94
End tidal CO2 Detection	Capnoline Adult non-intubated with Oxygen tubing	$ 13.38	1	$ 13.38
End tidal CO2 Detection	Capnoline Intubated Pediatric/Adult	$ 10.29	1	$ 10.29
Secondary, Blind Insertion device	Assorted Sizes	$ 41.85	1	$ 41.85
Needle Cricothyrotomy	Adult and Child sizes	$ 186.63	1	$ 186.63
Vascular Access				
0.9% NaCl USP IV Fluid Note: It is cheaper to buy the 1000 cc bags over the 500 cc	14/case price for individual units =	$ 3.15	4	$ 12.60
Alcohol Preps	Large 100/box	$ 4.93	1	$ 4.93
Povidone Iodine optional	Prep Pads 100/box	$ 5.43	0	$ -
Intravenous Safety Catheter	14 ga X 1.25"	$ 3.19	4	$ 12.76
Intravenous Safety Catheter	16 ga X 1.25"	$ 3.19	4	$ 12.76
Intravenous Safety Catheter	18 ga X 1.25"	$ 3.19	4	$ 12.76
Intravenous Safety Catheter	20 ga X 1.25"	$ 3.19	4	$ 12.76
Intravenous Safety Catheter	22 ga X 1"	$ 3.19	4	$ 12.76
Intravenous Safety Catheter	24 ga X .75"	$ 3.19	4	$ 12.76
Carpuject Note: Distributor may give carpujects for free with purchase of medications, ask distributor		$ 1.09	2	$ 2.18
Syringe safety	1 cc TB, 25 ga X .625" 100/ box	$ 72.80	1	$ 72.80

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
Vascular Access Continued				
Syringe safety	3 cc 23 ga X 1" 100/ box	$ 42.74	1	$ 42.74
Syringe safety	5 cc 21 ga X 1 " 50/box	$ 49.42	1	$ 49.42
Latex free tourniquet	1 X 19", 50/box	$ 18.65	1	$ 18.65
Tagaderm	100/ box	$ 48.41	1	$ 48.41
Transfer Needles (Hypodermic)	21 gaX 1.5" 100/ box	$ 8.29	1	$ 8.29
Transfer Needles (Hypodermic)	18 ga X 1.5" 100/ box	$ 8.29	1	$ 8.29
Disposable Arm Board	Adult 3"x18"	$ 1.31	2	$ 2.62
Disposable Arm Board	Pediatric 3"X9"	$ 1.15	2	$ 2.30
Macro Drip	10 gtts	$ 4.75	4	$ 19.00
Micro drip	60 gtts	$ 4.99	2	$ 9.98
NOTE: IO's are not optional themselves, instead these are options for an IO device				$ -
EZ IO ◊	Driver	$ 295.00	1	$ 295.00
EZ IO ◊	15 mm Needle 5/box Pediatric	$ 520.00	1	$ 520.00
EZ IO ◊	25 mm Needles 5/box Adult	$ 520.00	1	$ 520.00
EZ IO ◊	45 mm Needles 5/box Large Adult	$ 575.00	1	$ 575.00
BIG IO ◊	Adult	$ 88.46	0	$ -
BIG IO ◊	Pediatric	$ 88.46	0	$ -
Disposable Infuser		$ 23.78	2	$ 47.56
Other Advanced Equipment				
Nebulizer		$ 1.27	2	$ 2.54
Glucometer Note: Most distributors will give glucometers away for free on request if purchasing test strips, ask distributor for details		$ 47.49	1	$ 47.49
Glucometer test strips	capillary blood 50/box	$ 50.95	1	$ 50.95
Lancets	100/box	$ 17.68	1	$ 17.68
Needle for Decompression	14 ga X 3.25	$ 20.97	2	$ 41.94

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	sub-total
Medications				
Oxygen Price will vary depending on amount and method of purchase				
Cardiovascular				
1:10,000 epinephrine	1 mg/ 10 mL pre-filled	$ 5.98	6	$ 35.88
Adenosine	6 mg/ 2 mL pre-filled	$ 42.75	1	$ 42.75
Adenosine	12 mg/ 4 mL pre-filled	$ 78.74	2	$ 157.48
Atropine	1 mg/ 10 mL pre-filled	$ 8.07	3	$ 24.21
Amiodarone	150 mg/ 3 mL Vial	$ 11.69	4	$ 46.76
Nitroglycerin	Sublingual Spray 0.4 mg/ 4.9 gm 60 metered doses	$ 299.00	1	$ 299.00
ASA	81 mg, 36 tabs/ bottle Children's chewable	$ 1.84	1	$ 1.84
Vasopressin	20 units/ mL, Vial	$ 8.04	2	$ 16.08
Cardiopulmonary				
Albuterol	.083% 2.5 mg/ 3 mL 25/box	$ 15.93	2	$ 31.86
Ipratropium Bromide	.02% 2.5 mL vial, 25/box	$ 22.00	2	$ 44.00
1:1,000 epinephrine	ampule 1 mg/mL	$ 2.58	2	$ 5.16
Furosemide	prefilled 40 mg/4 mL	$ 5.37	2	$ 10.74
Diabetic				
Dextrose	Adult, pre-filled 50% 25 gm 50 mL	$ 6.59	1	$ 6.59
Dextrose	Pediatric pre-filled 25%, 10 mL	$ 7.49	1	$ 7.49
Oral Glucose	3 tubes/ pack 15 gm	$ 14.72	1	$ 14.72
Glucagon	Emergency Kit 1 mg/mL	$ 227.00	1	$ 227.00

◊ Indicates an optional piece of equipment

Equipment	Size or Type	Unit Price	Count	Sub-Total
Analgesics				
Morphine	Class II Controlled Luer Locking Carpuject 10 mg/ mL 10/box	$ 27.53	2	$ 55.06
Anti-Seizure				
Midazolam (versed)	Class IV Controlled Vial 5 mg/mL 10/box	$ 51.39	2	$ 102.78
Miscellaneous				
Sodium Bicarbonate	pre-filled 8.4% 50 mEq 1mEq/mL	$ 7.26	2	$ 14.52
Magnesium Sulfate	pre-filled 50% 5 gm/10 mL	$ 8.51	0	$ -
Naloxone hydrochloride (Narcan)	pre-filled 2 mg/ 2 mL	$ 25.84	2	$ 51.68
NaCl 0.9% flushes	10 mL	$ 1.05	4	$ 4.20
Lidocaine	pre-filled 100 mg/5 mL	$ 6.46	1	$ 6.46
Epi-Pen Auto-Injector ◊		$ 295.55	0	$ -
Diphenhydramine Luer lock carpuject	50 mg	$ 4.22	1	$ 4.22
DuoDote Auto-Injector		$ 62.52	2	$ 125.04
Dopamine	pre-mixed 400 mg/250 mL	$ 33.68	1	$ 33.68
Other Necessary Equipment				
First In Bag		$ 418.97	1	$ 418.97
Trauma Bag ◊		$ 187.00	1	$ 187.00
Drug Box		$ 180.65	1	$ 180.65
Intubation Pack		$ 84.89	1	$ 84.89
C-collar Bag		$ 69.55	1	$ 69.55
clip board Needed if doing paper reporting		$ 42.84	0	$ -
Paper reports prices will vary depending on a number of factors, contact a printer				
Panasonic Tough Book Needed for electronic reporting		$ 4,500.00	1	$ 4,500.00
Software cost may be free to have attached cost, contact vendor for details				
Hardware may be included contact vendor for details				
Seals	100/pack	$ 29.39	1	$ 29.39
◊ Indicates an optional piece of equipment			Sub-Total	$ 59,179.16

Equipment	Size or Type	Unit Price	Count	Sub-Total
Optional				
Mucosal Atomization Device (MAD)◊	with 3 mL syringe	$ 4.95	2	$ 9.90
IV warmer◊		$ 434.60	1	$ 434.60
Portable Fridge-Freezer◊		$ 1,090.82	1	$ 1,090.82
Morgan Therapeutic Lens◊		$ 29.83	2	$ 59.66
CPAP◊	Generator, fixed flow	$ 525.00	1	$ 525.00
CPAP Mask Kit◊	procedure Kit 10 cm H2O 10/case	$ 624.72	2	$ 1,249.44
Ventilator◊		$ 2,624.00	1	$ 2,624.00
◊ Indicates an optional piece of equipment			Sub-Total	$ 5,993.42
			TOTAL	**$ 65,172.58**

Notes:

- It is assumed that the agency will be using a Computer based reporting (ePCR) system. Prices of software and hardware may vary depending on the billing agency used or subcontractor that is supplying software and/or equipment.
- The prices selected for this estimated represent median list prices, there could be variation within cost by purchasing in bulk or choosing cheaper supplies. Additionally there are a limited number of supplies that could serve a dual role in patient care and can eliminate redundancies n purchasing, for example certain varieties of bulky trauma dressings can also be used as burn sheets and dressings as per manufacturer claims.
- MAST trousers are not included in this estimate.
- Patient handling devices such as cots, stair chairs or lifting devices are not included here, but are in the body of the report in Ambulance cost.
- If an ALS service is initiated the department does not need to purchase an AED as it will have more advanced cardiac monitors. Since the Department will more than likely be maintaining EMT-Basic level providers it should invest in monitors that have an AED mode.

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Appendix D: Plymouth New Hampshire Agreement between Town and University

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LIFE SAFETY SERVICES AGREEMENT

THIS AGREEMENT (the "Agreement") dated February 23, 2004 by and between the Town of Plymouth, a municipal corporation organized and existing under the laws of the State of New Hampshire, with an office and place of business at 6 Post Office Square, Plymouth, New Hampshire
03264 (the "Town"), and Plymouth State University, a nonprofit Corporation organized and existing under the laws of the State of New Hampshire with an office and place of business at 17 High Street, Plymouth, New Hampshire 03264 (the "University")

Whereas, the Town and the University have agreed to work cooperatively for their collective well-being and future;

Whereas, the Town recognizes that the University is tax-exempt under the laws of the State of New Hampshire;

Whereas, the Town recognizes that, unless and until the NH Legislature requires the State of New Hampshire to compensate the Town for public safety costs incurred because of the presence of the University in the Town, the University has no legal requirement outside of this agreement to pay any money to the Town to offset public safety costs. The Town further recognizes that despite the unequal bargaining power of the parties, the University is assisting the Town by contributing to the Town's public safety costs.

Whereas, the University recognizes that the Town is obligated to provide life safety services to the citizens of the Town and that there are significant costs for the Town to deliver those services;

Whereas, the Town acknowledges the economic, cultural, and social value of having the University as part of the community;

Whereas, the University understands and agrees that students who live on the University campus are the direct responsibility of the University;

Whereas, the Town acknowledges its direct responsibility for citizen safety and protection to all persons and property within the boundaries of the Town; and

Whereas, the Town recognizes USNH Board of Trustee policy BOTIII.D concerning payment for municipal services.

NOW THEREFORE IN CONSIDERATION of the mutual covenants, agreements and other consideration of the parties described herein, covenant and agree as follows:

1. The University will pay the Town its fair share of the costs for dispatch services for as long as the University continues to subscribe to the service. The University's fair share

is based on the number of calls handled for the University as a percentage of the cost to the Town to provide dispatch services.

2. The University will continue its current practice for payment of ambulance services. The University currently reimburses the Town for each ambulance service response provided on-campus for which there is no payment to the Town. If the Town does not receive payment for an on-campus ambulance response within six months from the time of service, the University will reimburse the Town for the cost of that ambulance response and the University will bill and collect the charge from the student.

3. In recognition of the special equipment needs of the fire department for service to the University and its buildings, the University will make an annual payment as follows:

   a. The University will pay the Town an amount to cover operating costs of the fire department equal to 28% of the fire department annual budget.

   b. The University will pay the Town $70,000 per year towards fire department capital expenditures. The Town and University acknowledge that, during the term of this Agreement, the Town intends to incur capital expenditures for the fire department to purchase property and construct a new building to house the fire department and that any such building may also house other Town departments. During the term of this Agreement, the Town also expects to create a capital reserve account to replace the ladder truck but the Town does not expect to purchase the truck until after termination of the first term of this Agreement. The dollar amount under this section is calculated with a long-term view (20-25years) of capital and is inclusive of the university's current share of all of the above capital assets. Capital expenditures under this paragraph do not include ambulance replacement, dispatch equipment or single pieces of equipment that cost less than $10,000.

4. The University will pay the Town for providing fire department plan review of campus projects expected to cost $1,000,000 (one million dollars) or more at an hourly rate (based upon salary and benefits divided by the average hourly week) when the University desires a fire and life safety compliance review. The cost of the review will be mutually discussed and estimated prior to conducting the plan review. It is understood that fire and life safety plan reviews for projects costing less than $1,000,000 will be conducted as part of the annual fire department operating budget.

5. The University will further support the Town in the following ways:,

a. The University will reimburse the Town for the cost of creating and maintaining a full-time code enforcement officer. This officer will be an employee of the fire department and her/his job description is shown in attachment "A". The cost of this position for salary, overtime, benefits, and other associated costs is calculated at

$50,000 for FY2004. Any future increases for this position will be reimbursed to the Town by the University and will be based on the average pay increase and increases to other associated costs for all fire department employees.

b. The University and Town believe that a cause of the social problems on campus and in Town is the direct result of the misuse of alcohol and drugs, including underage drinking and the illegal sale of alcohol to minors. To help with this problem, the University will pay $50,000 to the Town beginning FY 2004 to support the prosecutor's office. Increases in the future years will be limited to the average pay increase for other municipal employees.

c. The University will reimburse the Town for expenses incurred for extraordinary, one-time services as a result of large gatherings of on-campus students in off-campus settings, such as after the Red Sox loss in October 2003. The Town and the University shall make every effort, in planning appropriate deployment of forces and measures to be taken in anticipation of such gatherings, to agree in advance on the relative cost sharing between the parties.

6. The University System of New Hampshire Board of Trustees, through the UNH Chancellor, delegates to the President of Plymouth State University the responsibility to ensure for the safety and security of the University. Police Officers are employed for the purpose of law enforcement and security of the students, faculty, staff, and visitors.

The Town of Plymouth, New Hampshire, by and through the Board of Selectmen and with the approval of its Chief of Police, agrees to provide police appointments to designated members of Plymouth State University Police Department provided that such members have complied with all relevant administrative rules and regulations of the New Hampshire Police Standards and Training Council and have passed all of the requirements for appointment required by the Town, and are accepted and continue to be acceptable in all aspects including training. All persons so appointed shall have the same police powers consistent with other standard police officer appointments made by the Town of Plymouth, New Hampshire Board of Selectmen. Said grant of law enforcement authority confers no right of employment with the Town.

It is understood that the Town of Plymouth, New Hampshire and Plymouth State University each recognize that the citizens of the Town of Plymouth should not be burdened with providing law enforcement services to the University community without adequate compensation. Therefore, Plymouth State University agrees to assume the responsibility of law enforcement on all University property within the Town of Plymouth, New Hampshire, subject to the oversight of the Town's Police Chief. Plymouth State University recognizes that pursuant to New Hampshire statute the Town of Plymouth Chief of Police is the chief law enforcement officer within the Town of Plymouth. The Town recognizes that the President of Plymouth State University is the Chief Executive Officer at the University and is charged with the management of all University employees, including those of the University Police Department.

a. Appointment of Police Officers for Plymouth State University

The Town of Plymouth, New Hampshire shall, upon request of the Plymouth State University Chief Law Enforcement Officer, or in his/her absence his/her designee, provide police appointments to those persons so designated to serve as police officers for the Plymouth State University Police Department. All persons whose names submitted for appointment shall be subject to and conform to all relevant administrative rules and regulations of the New Hampshire Police Standards and Training Council and those of the Town.

The Town of Plymouth Chief of Police shall have the right to immediately suspend, the Towns grant of appointment pending a hearing and may reinstate or permanently terminate the police appointment, after notice and hearing, of any Plymouth State University police officer, except that said termination shall only be for reasons which are neither arbitrary or capricious and only after a presentation of reasons to the Chief Law Enforcement Officer for Plymouth State University. However, the decision of the Town's police chief shall be final and binding upon the University. The University shall promptly notify the Town's Chief of Police upon the University's discipline of or termination of employment of a Plymouth State University Police Officer.

b. Police Authority

Generally, and by virtue of their police appointments by the Town of Plymouth Board of Selectmen, Plymouth State University police officers shall have law enforcement authority within the Town of Plymouth without limitation, except as herein provided or as otherwise proscribed by law.

c. Exercise of Police Authority/Plymouth State University

The Plymouth State University Police Department shall have primary responsibility for law enforcement, including the investigation and prosecution of offenses that may arise therefrom, on Plymouth State University properties. Plymouth State University police officers shall refrain from exercising their law enforcement authority on non-University ways and

properties except when violations of law occur in their presence, when in pursuit of a law violator or suspected law violator for an offense committed on a University way or property,

when conducting an investigation for an offense that was committed or may have been committed on a University way or property, when requested to do so by a Plymouth Police Department official, or in all other situations when the safety and/or welfare of the public requires immediate law enforcement action.

d. Exercise of Police Authority/Town of Plymouth

Police Officers employed by the Plymouth Police Department shall defer from exercising their law enforcement authority on Plymouth State University ways and properties except when violations of law occur in their presence, when in pursuit of a law violator or suspected law violator, when conducting criminal investigations, when requested to do so by a University Police official, when the Plymouth Police Chief decides that it is in the best interest of justice to do so or in all other situations when the safety and/or welfare of the public requires immediate law enforcement action. When appropriate the Town Police Chief will consult with the Plymouth State University Police Chief or other appropriate University
official before taking action on campus. The terms expressed herein shall not be interpreted as limiting in any way the statutory authority of the Plymouth Police Department or any of its officers.

e. Special Details

Necessary traffic control or direction that may be required upon ways maintained by the Town of Plymouth arising prior to, during, or immediately following an event sponsored by or held at Plymouth State University facilities shall be the responsibility of the Plymouth State University unless Plymouth State University specifically requests the Plymouth Police Department to assume said traffic responsibilities.

The Plymouth State University Police Department will coordinate operational plans with the Town of Plymouth Police Department when major events that have an impact upon the Plymouth community are anticipated.

f. Reporting of Campus Crimes and Arrests to the Town of Plymouth

It is recognized that the Plymouth State University Police Department houses, maintains and operates a law enforcement computer system also utilized by the Plymouth Police Department. All Plymouth State University crime and arrest data is available 24 hours a day for review by the Town of Plymouth Police Department.

The Town of Plymouth Police Department agrees to provide access to its record system so that the Plymouth State University Police Department can correlate crime and arrest data as may be necessary to fulfill the University's requirement to report under the Federal Campus Crime and Cleary acts.

g. Mutual Aid Agreements

Only the Plymouth Police Department, being a "town or city" police agency, may enter into Mutual Aid Agreements as defined by RSA 105:13. It is therefore understood that any agreement the Plymouth Police Department has with another town or city extends to all sworn members of the Plymouth State University Police Department.

The Plymouth State University Police Department may request of the Plymouth Police Chief that other agreements be entered into in cases where such assistance of a specific community is desired, and whereas such an agreement does not already exist. Any such agreement must include language to the effect that the cooperating Town will assume all responsibility of any kind for the participating Plymouth State University Police officers.

As these documents change frequently due to changing police administrations, an annual list of all current Mutual Aid Agreements shall be prepared by the Plymouth Police Department and sent to the University Police Department.

h. Plymouth State University Police Department Policies and Procedures

The Plymouth State University Police Department desires to maintain an agency that is committed to excellence and will as a condition precedent to the continuation of this agreement, obtain and maintain accreditation status at least equal to that of the Plymouth police Department within two years by using the New Hampshire Accreditation step system.

The Plymouth State University Police Department may author and maintain policies and procedures for all situations and practices that do not imply the use of their sworn police appointment, understanding that many tasks are security functions that do not imply the use of their sworn authority. In instances where situations and practices imply the use of their sworn police appointments, the Plymouth State University Police Department shall not maintain a policy or procedure that conflicts with the policy or procedure of the Plymouth Police Department or the appointing authority. Examples of topic areas considered to imply the use
of police appointments include, but are not limited to, Laws of Arrest, Use of Force, Vehicular Pursuits, and Authorized Weapon Systems.

i. Police Training of Plymouth State University Police Department Members
As required by law, the Plymouth State University Police Department agrees to comply with all administrative rules and regulations of the New Hampshire Police Standards and Training Council. Additionally, Plymouth State University will also comply with any and all rules and regulations pertaining to police training that are promulgated by the Town. Records of compliance shall be kept at the University Police Department and copies shall be provided to the Chief of the Plymouth Police Department upon request.

j. Insurance Requirements and Indemnification of the Town of Plymouth for actions of the Plymouth State University Police Officers
(1) Plymouth State University agrees to carry general liability insurance for members of the Plymouth State University Police Department with minimum limits of Two Million Dollars ($2,000,000) as the single limit for each occurrence of bodily injury, personal injury and property damage, with a Four Million Dollars ($4,000,000) umbrella policy. The policy shall be written on an occurrence made basis and name the Town as an additional insured.

Certificates of insurance shall be obtained by the University and shall be provided annually to the Town. The University shall immediately advise the Town of any claim or litigation that may result in liability to the Town. For any and all causes of action resulting from, arising out of, or relating to the Town's grant of law enforcement authority to a University officer, the University's insurance coverage shall be primary insurance as respects the Town, its officers, officials or employees and any insurance or self-insurance maintained by the Town, its officers, officials or employees shall be in excess of, and not contribute with the University's insurance.

(2) Plymouth State University shall completely and fully indemnify and hold harmless the Town of Plymouth and its respective officers, boards, commissions, employees, agents and contractors (hereinafter referred to as "TOWN Indemnities") against any and all causes of action resulting from, arising out of, or relating to the Town's grant of law enforcement authority to a University officer without regard to the nature or location or the acts or omissions alleged to have caused the injury or damages which may include, but are not limited to negligent hiring, retention, training, discipline and any other acts or omissions on the part of any University Police Officer while acting in their official capacity or otherwise, regardless of where said acts may allegedly occur within or outside the Town of Plymouth and regardless of whether the act or omission was authorized and the University Police Department's failure to comply with any Federal, State or local statute, ordinance or
regulation. Specifically by agreeing to fully and completely indemnify the Town Indemnities, the University is agreeing not only to satisfy any judgments or settlements against the Town
as the result of any action brought against the Town resulting from, arising out of, or relating to the Town's grant of law enforcement authority to a University officer, but also to pay for any and all expenses reasonably incurred by the Town Indemnities including but not limited to reasonable attorney's fees, reasonable costs of defense and preparation of the Town's employees and any other reasonable costs. The University specifically agrees that the Town retains the right to use its own attorneys to defend any claim if it so chooses or to protect its interest. This indemnification provision shall survive the termination of this Agreement as related to causes of action accruing during the term of this Agreement.

k. Mutual Understanding

Plymouth State University and the Town of Plymouth agree that the primary duty and obligation of each of their respective law enforcement agencies is to provide professional law enforcement protection services within their primary geographical areas as herein above defined, and further that each shall comply, where practicable, with requests for assistance from the other. It is understood by each party to this agreement that honoring such requests
for assistance are voluntary, but in no instance shall such assistance be unreasonably withheld.

The parties agree that consistency and uniformity of criminal law enforcement within the entire Plymouth community is of paramount importance in spite of the fact that there are two separate police departments operating within the community. Accordingly the Town of Plymouth and Plymouth State University recognize, affirm, and agree that their approach to criminal law enforcement will not be altered or abridged by virtue of the fact that the University population is primarily students, faculty, and staff of Plymouth State University, or as a result of the fact that the Plymouth State University police may provide additional services of a security or other nature to the campus residents and the
University administration beyond what a municipal police officer might
normally provide.

7. The Town Administrator and the University's Vice President for Financial Affairs will meet in January of each year to determine the annual cost of this Agreement for the University. A follow-up meeting will occur after Town Meeting to finalize the payment.

8. Should legislation be enacted that requires the University to pay property or other local taxes, or to make payments in lieu of taxes in any form or to have such payments made on behalf of the University, this agreement shall terminate upon the commencement of such tax or payment in lieu of the tax obligations.

9. The Town agrees to appoint two representatives with voting rights from the University to the Town's advisory budget committee. Representatives for the University will be chosen by

the University President in consultation with the Chair of the Board of Selectmen and each University representative shall reside in the Town of Plymouth.

10. This agreement shall not give rise to a partnership, agency or other relationship between the parties, except as otherwise provided herein. This Agreement does not establish an employee-employer relationship between the Town and University. Neither party shall represent itself to be the agent, employee, partner, or joint venture of the other party and may not obligate the other party or otherwise cause the party to be liable under a contract or otherwise.

11.Notices. Any notices in connection with this Agreement must be sent to each party at the addresses set forth on the first page of this Agreement, or in the event of a change of address or fax number, then to such other address or fax number as to which notice of the change is given. Such notices will be effective (a) on the delivery date if delivered personally to the party; (b) on the delivery date if delivered by a commercial overnight carrier with written verification of receipt; (c) five (5) business days after the mailing date, whether or not received, if sent by US mail, return receipt requested; and (d) on the delivery date if transmitted by confirmed facsimile.

Town: Board of Selectmen
Town of Plymouth
6 Post Office Square
Plymouth, NH 03264

University: Plymouth State University
President Donald Wharton
17 High Street
Plymouth, NH 03264

12. This Agreement is not intended to be a third party beneficiary contract or to confer any rights on any person other than the parties to this agreement.

13. Should a court of competent jurisdiction deem any portion of this agreement void, then all remaining parts hereof shall remain in effect.

14. This Agreement may not be assigned by the University without the prior written consent of the Town and any purported assignment in violation of this provision shall be null and void.

15. This Agreement constitutes the entire agreement and understanding between the parties regarding the subject matter hereof, and merges all prior discussions, proposals, and agreements between them relating thereto. No waiver, modification or amendment to this Agreement shall be valid unless in writing and signed by the parties hereto.

16. No failure or delay on the part of either party in the exercise of any right, power or remedy under this Agreement shall operate as a waiver thereof; nor shall any single or partial exercise of any right, power or remedy preclude other or further exercise thereof, or the exercise of any other right, power or remedy.

17. Dispute Resolution and Governing Law. This agreement will be governed by, and construed in accordance with the laws of the state of New Hampshire.

18. The terms of this Agreement shall remain in full force and effect from July 1, 2003 until June 30, 2010.

John H. Tucker Chair, Board of Selectmen	Date	Donald P. Wharton President Plymouth State University	Date
Paul SanSoucie Selectman	Date	Edward R. MacKay Vice Chancellor for USNH	Date
Quentin Blaine Selectman	Date		

Appendix E: Revenue Estimation

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2013 Medicare Fee Schedule for Key West, Florida

Description	Payment
Mileage	**$10.74**
BLS	**$369.75**
ALS	**$439.08**
ALS2	**$635.51**

Estimated Revenue for Mileage

Description	Payment	Avg. per Transport	Total Payment
Mileage	**$10.74**	**4**	**$42.96**

Estimated Gross Revenue for Key West

Description	Fee	Mileage	Total Charge	Transports	Sub-Total
BLS	$369.75	$42.96	$412.71	1,113	$459,346.23
ALS1	$439.08	$42.96	$482.04	1927	$774,638.28
ALS2	$635.51	$42.96	$678.47	38	$12,890.93
DOA*	$369.75	N/A	$369.75	22	$8,134.50
Total Charges					**$1,255,009.94**
Medicare Payment (80%)					**$1,004,007.95**
Write-Off (20%)					**$251,001.99**

* DOA means In-Field Pronouncement of Death, with the appropriate modifier this will be billed at the BLS rate and will not qualify for mileage.

Estimated Revenue by Percentage of Collection

Percent Collected	Gross Revenue	Net Revenue After 8% Billing Deduction
50%	$502,003.98	$461,843.66
60%	$602,404.77	$554,212.39
70%	$702,805.57	$646,581.12
80%	$803,206.36	$738,949.85

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Appendix F: Billing Agency Proposals

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AMB

Key West Fire Department Financial Analysis

Florida Fee Schedule		Medicare	BCBS	Private Insurance	Medicaid	Private Pay
A0425 Mileage		$10.85	$9.35	$8.52	$1.36	$0.85
A0427 ALS Emer		$440.47	$451.89	$374.22	$225.34	$100.55
A0429 BLS Emer		$370.92	$287.50	$315.99	$157.28	$91.67
A0433 ALS2		$637.53	$487.52	$412.99		
Charge Mix		30%	5%	54%	1%	10%
Yearly Transports	2739	822	137	1479	27	274
Average Mileage / Reimbursment	5	$8.68	$9.35	$8.52	$1.36	$0.85
Service Level Mix / Reimbursment	ALSE BLSE ALS2	$330.90	$385.38	$350.86	$196.13	$96.25
	59% 41% 1%					
Avg Reimbursment per call		$374.30	$432.13	$393.46	$202.93	$100.50
Yearly Revenue Per Payor		**$307,564.51**	**$59,179.72**	**$581,957.07**	**$5,558.13**	**$27,526.23**

Yearly Insurance Revenue	**$954,259.44**
Yearly Self Pay Revenue	**$27,526.23**
Total Revenue	**$981,785.67**
Yearly Revenue Per Run	**$358.45**
Current Revenue Per Run	**$281.51**
Gross Collections Difference	**$210,729.78**

AMBULANCE TRANSPORT

GROSS REVENUE PROJECTIONS FOR KEY WEST FIRE DEPARTMENT

Average annual transports:	4400
Adjustment for average self pay/Medicaid (20%):	.80
Adjusted annual average:	3520

Average annual BLS transports (70%):	2,464
Average annual ALS1 transports (29%):	1,022
Average annual ALS2 transports (1%):	34
Average annual miles at 5 miles per transport:	17,600

*Estimated 50% of total transports to be Medicare.

Procedures	Charges	Commercial Ins./ Private Pay	TOTAL REVENUE	Medicare Allowable Rates	TOTAL REVENUE	
BLS	$625.00	1232 @ $ 625.00	$ 770,000.00	1232 @ $370.92	$456,973.44	
ALS1	$900.00	511 @ $ 900.00	$ 459,900.00	511 @ $440.47	$225,080.17	
ALS2	$1200.00	17 @ $1200.00	$ 20,400.00	17 @ $637.53	$ 10,838.01	
Mileage	$12.00/mile	8800 @ $12.00/mile	$ 105,600.00	8800 @ $10.85/mile	$ 95,480.00	
		TOTAL:	$1,355,900.00	MEDICARE TOTAL:	$788,371.62	$2,144,271.62

Total estimated revenue from all sources is $2,144,271.62. Based upon a reasonable estimated collection rate of 75% of all Commercial and Private Insurance Sources ($1,016,925.00) plus a reasonable estimated collection rate of 85% of all Medicare insurance ($670,115.88), the total net revenue from all sources is estimated to be approximately $1,687,040.88.

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Without Fee Increase – Charges Model

Advanced Data Processing, Inc.
Analysis of EMS Revenue
Summary Analysis
City of Key West

	2015	2016	2017	2018
Level of Service Charges				
Ground Mileage A0425	$ 12.00	$ 12.00	$ 12.00	$ 12.00
ALS -NE A0426	$ -	$ -	$ -	$ -
ALS-EM A0427	$ 900.00	$ 900.00	$ 900.00	$ 900.00
BLS-NE A0428	$ -	$ -	$ -	$ -
BLS-EM A0429	$ 625.00	$ 625.00	$ 625.00	$ 625.00
Rotary Air A0431	$ -	$ -	$ -	$ -
ALS2 A0433	$ 1,200.00	$ 1,200.00	$ 1,200.00	$ 1,200.00
Specialty Transport (SCT) A0434	$ -	$ -	$ -	$ -
Air Mileage A0436	$ -	$ -	$ -	$ -
Treatment Without Transport (TWT) A0998	$ -	$ -	$ -	$ -
Supplemental Fees (Oxygen, etc.)	$ -	$ -	$ -	$ -
Level of Service Mix				
ALS -NE A0426	0.00%	0.0%	0.0%	0.0%
ALS-EM A0427	36.40%	36.4%	36.4%	36.4%
BLS-NE A0428	0.00%	0.0%	0.0%	0.0%
BLS-EM A0429	25.21%	25.2%	25.2%	25.2%
Rotary Air A0431	0.00%	0.0%	0.0%	0.0%
ALS2 A0433	0.43%	0.4%	0.4%	0.4%
Specialty Transport (SCT) A0434	0.00%	0.0%	0.0%	0.0%
Treatment Without Transport (TWT) A0998	37.96%	38.0%	38.0%	38.0%
Supplemental Fees (Oxygen, etc.)	0.00%	0.0%	0.0%	0.0%
Transport Volume				
Total Transports	4,415	4,459	4,504	4,549
Annual Tranport Growth	368	372	375	379
Average Mileage				
Average Ground Mileage A0425	3.0	3.0	3.0	3.0
Average Air Mileage A0436	-	-	-	-
Charge Mix				
Medicare	32.4%	32.4%	32.4%	32.4%
Medicaid	10.0%	10.0%	10.0%	10.0%
Insurance- Commercial	28.0%	28.0%	28.0%	28.0%
Self- Pay	29.5%	29.5%	29.5%	29.5%
Number of Units Billed				
ALS -NE A0426	-	-	-	-
ALS-EM A0427	1,607	1,623	1,639	1,656
BLS-NE A0428	-	-	-	-
BLS-EM A0429	1,113	1,124	1,135	1,147
Rotary Air A0431	-	-	-	-
ALS2 A0433	19	19	19	20
Specialty Transport (SCT) A0434	-	-	-	-
Treatment Without Transport (TWT) A0998	1,676	1,693	1,710	1,727
	4,415	**4,459**	**4,504**	**4,549**
Supplemental Fees (Oxygen, etc.)	-	-	-	-
Ground Mileage A0425	8,217	8,299	8,382	8,466
Air Mileage A0436	-	-	-	-
Gross Charges				
Ground Mileage A0425	$ 98,604	$ 99,590	$ 100,586	$ 101,592
ALS -NE A0426	$ -	$ -	$ -	$ -
ALS-EM A0427	$ 1,446,300	$ 1,460,763	$ 1,475,371	$ 1,490,124
BLS-NE A0428	$ -	$ -	$ -	$ -
BLS-EM A0429	$ 695,625	$ 702,581	$ 709,607	$ 716,703
Rotary Air A0431	$ -	$ -	$ -	$ -
ALS2 A0433	$ 22,800	$ 23,028	$ 23,258	$ 23,491
Specialty Transport (SCT) A0434	$ -	$ -	$ -	$ -
Air Mileage A0436	$ -	$ -	$ -	$ -
Treatment Without Transport (TWT) A0998	$ -	$ -	$ -	$ -
Supplemental Fees (Oxygen, etc.)	$ -	$ -	$ -	$ -
	$ 2,263,329	$ 2,285,962	$ 2,308,822	$ 2,331,910
AVG CHARGE	$ 512.65	$ 512.65	$ 512.65	$ 512.65

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Without Fee Increase – Revenue Model

Advanced Data Processing, Inc
Analysis of EMS Revenue
Summary Analysis
City of Key West

	2015	2016	2017	2018
Gross Charges				
Ground Mileage A0425	$ 98,604	$ 99,590	$ 100,586	$ 101,592
ALS -NE A0426	$ -	$ -	$ -	$ -
ALS-EM A0427	$ 1,446,300	$ 1,460,763	$ 1,475,371	$ 1,490,124
BLS-NE A0428	$ -	$ -	$ -	$ -
BLS-EM A0429	$ 695,625	$ 702,581	$ 709,607	$ 716,703
Rotary Air A0431	$ -	$ -	$ -	$ -
ALS2 A0433	$ 22,800	$ 23,028	$ 23,258	$ 23,491
Specialty Transport (SCT) A0434	$ -	$ -	$ -	$ -
Air Mileage A0436	$ -	$ -	$ -	$ -
Treatment Without Transport (TWT) A0998	$ -	$ -	$ -	$ -
Supplemental Fees (Oxygen, etc.)	$ -	$ -	$ -	$ -
	$ 2,263,329	**$ 2,285,962**	**$ 2,308,822**	**$ 2,331,910**
AVG CHARGE	$ 512.65	$ 512.65	$ 512.65	$ 512.65
Limits on Allowance				
Ground Mileage A0425	$ 12,972	$ 13,102	$ 13,233	$ 13,365
ALS -NE A0426	$ -	$ -	$ -	$ -
ALS-EM A0427	$ 356,468	$ 360,033	$ 363,633	$ 367,269
BLS-NE A0428	$ -	$ -	$ -	$ -
BLS-EM A0429	$ 147,737	$ 149,215	$ 150,707	$ 152,214
Rotary Air A0431	$ -	$ -	$ -	$ -
ALS2 A0433	$ 5,434	$ 5,488	$ 5,543	$ 5,598
Specialty Transport (SCT) A0434	$ -	$ -	$ -	$ -
Air Mileage A0436	$ -	$ -	$ -	$ -
Treatment Without Transport (TWT) A0998	$ -	$ -	$ -	$ -
Supplemental Fees (Oxygen, etc.)	$ -	$ -	$ -	$ -
	$ 522,611	**$ 527,837**	**$ 533,116**	**$ 538,447**
Net Allowable Charges				
Ground Mileage A0425	$ 85,632	$ 86,488	$ 87,353	$ 88,227
ALS -NE A0426	$ -	$ -	$ -	$ -
ALS-EM A0427	$ 1,089,832	$ 1,100,730	$ 1,111,738	$ 1,122,855
BLS-NE A0428	$ -	$ -	$ -	$ -
BLS-EM A0429	$ 547,888	$ 553,367	$ 558,900	$ 564,489
Rotary Air A0431	$ -	$ -	$ -	$ -
ALS2 A0433	$ 17,366	$ 17,540	$ 17,715	$ 17,892
Specialty Transport (SCT) A0434	$ -	$ -	$ -	$ -
Air Mileage A0436	$ -	$ -	$ -	$ -
Treatment Without Transport (TWT) A0998	$ -	$ -	$ -	$ -
Supplemental Fees (Oxygen, etc.)	$ -	$ -	$ -	$ -
	$ 1,740,718	**$ 1,758,125**	**$ 1,775,706**	**$ 1,793,463**
Projected Collections				
Ground Mileage A0425	$ 50,629	$ 51,135	$ 51,647	$ 52,163
ALS -NE A0426	$ -	$ -	$ -	$ -
ALS-EM A0427	$ 575,626	$ 581,382	$ 587,196	$ 593,068
BLS-NE A0428	$ -	$ -	$ -	$ -
BLS-EM A0429	$ 300,297	$ 303,300	$ 306,333	$ 309,397
Rotary Air A0431	$ -	$ -	$ -	$ -
ALS2 A0433	$ 9,268	$ 9,361	$ 9,454	$ 9,549
Specialty Transport (SCT) A0434	$ -	$ -	$ -	$ -
Air Mileage A0436	$ -	$ -	$ -	$ -
Treatment Without Transport (TWT) A0998	$ -	$ -	$ -	$ -
Supplemental Fees (Oxygen, etc.)	$ -	$ -	$ -	$ -
	$ 935,820	**$ 945,178**	**$ 954,630**	**$ 964,176**
Projected Collections by Payer				
Medicare	$ 389,000	$ 392,890	$ 396,819	$ 400,787
Medicaid	$ 42,082	$ 42,502	$ 42,927	$ 43,357
Insurance	$ 475,500	$ 480,255	$ 485,057	$ 489,908
Private Pay	$ 29,238	$ 29,531	$ 29,826	$ 30,124
	$ 935,820	**$ 945,178**	**$ 954,630**	**$ 964,176**
Forecast Metrics				
Collections/Transport	$ 211.96	$ 211.96	$ 211.96	$ 211.96
Gross Collection %	41.3%	41.3%	41.3%	41.3%
Net Collection %	53.8%	53.8%	53.8%	53.8%

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