

Agenda  
Rescue Squad EMS Task Force  
Thursday, March 17, 2016, 6:00 pm  
Carter County Court House

1. Call to order
2. Additional introductions as needed
3. Approve the minutes of February 12, 2016
4. Review and discuss the task force path forward with emphasis on assigned focused responsibilities -- updated status on individual assignments
5. Discussion of suggestion by C. Hitechew for organization comparisons:
  - a. Organization Type (Third Service, Private Service, County Owned, Etc)
  - b. % of Budget from Billing/Insurance
  - c. % of Budget from Government
  - d. % of Budget Other Sources
  - e. # Calls Annual (transports should be separated)
  - f. % of Billing that is Collected
  - g. Collection Agency Used?
6. Old business
7. New business
8. Adjourn

**Draft Minutes**  
**Carter County Rescue Squad – EMS Task Force Workshop**  
**Carter County Court House**  
**February 12, 2016**

Members Present: Jessica Bowers, Sonja Culler, Chris Hitechew, Anthony Roberts, Dwain Rowe, Sam Shipley, Chris Williams, Robert Acuff

Members Absent: James Hughes, Martin Eason (excused)

The meeting was called to order by Robert Acuff at 6:10 pm in the Carter County Court House court room. Acuff welcomed Dwain Rowe (Wings) to the Task Force. Minutes of the January 21, 2016 meeting were unanimously approved. After the review of the EMS / Squad charge and specific tasks the following were agreed upon by the TF to begin developing a data base (5 year review) on which the group could compile its final report with assigned / volunteers so noted after each task:

- EMS / Squad Audit reports – A. Roberts
- History of financial support – S. Culler, S. Shipley
- Comparable audits from contiguous counties – C. Williams, C. Hitechew, S. Culler
- Unfunded mandates from local, State and federal governments – C. Hitechew, C. Williams
- Contracts currently and previously in force including Medicare/Medicaid –
- Impact of the ACA on EMS / Squads with special attention to reimbursements – R. Acuff
- Review rates for service – C. Hitechew, C. Williams
- Pharmaceutical costs – J. Bowers, A. Roberts
- Personnel cost – C. Hitechew, C. Williams
- Collection data – A. Roberts
- Insurance cost for employees to include workers compensation and health insurance – A. Roberts
- Billing software – it was agreed by the TF that the final report contain at least one paragraph on software cost to include maintenance agreements and other cost that are incurred as a part of software acquisition.
- Review of potential grant sources and other funding mechanism to assist EMS / Squad in meeting its mission and goals – J. Bowers, R. Acuff

Following task assignments, a lengthy discussion ensued regarding education expenses incurred for training and certification. This expense impacts negatively retention, advancement and longevity in the profession. It was concluded that a section on meeting educational needs and expenses be included in the report.

The meeting was adjourned at 7:10 pm.

March 17, 2016

### EMS-Rescue Squad Task Force Membership

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James Hughes		423.512.0542

March 17, 2016

## **Medicare Allowable Reimbursement for Each Level of EMS Service**

Mileage = \$7.34 per mile

ALS (Non-emergent) = \$254.38

ALS (Emergent) = \$402.76

BLS (Non-emergent) = \$211.98

BLS (Emergent) = \$339.17

ALS2 = \$582.94

# **Calculating Your EMS Service's “Average Cost of Service” And “Unit Hour Analysis”**

Developed by:

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## Unit Hour Analysis Worksheet

It is imperative for EMS providers to know what their costs are. Unfortunately, many EMS services have not figured out their cost of doing business! For those who have already calculated their estimated costs, we note that there are many different methods of cost calculation.

The main purpose of this form is to help a service determine your "Average Cost per Call" The UHA is also helpful in measuring productivity as well as overall system costs. This utility allows analysis and benchmarking to determine how effectively your system is working and can be an effective management tool.

To fully understand the information contained in the analysis it is prudent to provide a few definitions to assist in understanding the impact of the UHA.

A **unit hour** is equal to one hour of service by a fully equipped and staffed ambulance available for dispatch or assigned to a call. For ambulance services with average turnaround times which are greater than one hour, adjustments can be made to the listed formulas to achieve more accurate estimates.

**Utilization** is a measure of productivity, which compares the available resources (i.e. unit hours) with the actual amount of time those units are being utilized for patient treatment and transport or productive activity. This measurement is calculated to determine the percentage of unit hours actually consumed in productivity compared with the total staffed unit-hours.

### Unit Hour Analysis Summary:

Direct comparison and correlation of UHA between separate ambulance organizations is difficult as utilization rates are dependent on a number of other mitigating factors such as the presence of response time standards, shift length, overall time or length of transports; impact on employee wellness and safety, transport times and turnaround times as well as a variety of other operational and administrative issues.

Typically, EMS organizations strive for the highest utilization rates possible, with optimal overall utilization rates being considered in the .50 - .55 range. We utilize the following general scale when evaluating overall UHU:

- .55 - .45 – Optimal Utilization**
- .45 - .35 – Above Average Utilization**
- .35 - .25 – Average Utilization**
- .25 - .15 – Below Average Utilization**
- .15 - .01 – Poor Utilization**

The following is a "Cost / Unit Hour Analysis Form" with instructions. These instructions are provided in order to attempt to standardize the methodology used to calculate costs and achieve maximum understanding, of the calculation method.

In completing this form, you will need to know your costs as they relate to your ambulance calls only (i.e., no wheelchair van costs).

# UNIT HOUR ANALYSIS BASED ON FINANCIAL AND OPERATIONAL DATA FOR A FISCAL YEAR

1. **TOTAL UNIT HOURS PER WEEK = (A)** \_\_\_\_\_ **Manned Ambulance Hours**  
Estimated number of hours staffed per week.  
(See example listed below)
2. **AVERAGE CALL VOLUME PER WEEK = (B)** \_\_\_\_\_ **Calls Per Week**  
Estimated number of responses (including all transports, stand bys, refusals and other no transport calls for the fiscal year / divided by 52.07 weeks in a year.
3. **UNIT HOUR UTILIZATION = (B/A)** \_\_\_\_\_ **Calls Per Unit Hour**
4. **SHIFT UTILIZATION = (B/A) x 8 hrs.** \_\_\_\_\_ **Calls Per Unit Shift**
5. **TOTAL EXPENSES PER WEEK = (C)** \$ \_\_\_\_\_ **Expense Per Week**  
Take your total expenses per year divided by 52.07 week.
6. **TOTAL EXPENSES PER DAY = (C)/7 Days** \$ \_\_\_\_\_ **Expenses Per Day**
7. **COST PER UNIT HOUR: (Line C divided by Line A)** \$ \_\_\_\_\_ **Cost Per Unit Hour**
  - B. **Depreciation Cost for Ambulance(s) (If not included in #6)** \$ \_\_\_\_\_ **Increase for Ambulance Dep.**
  - C. **Depreciation Cost for Building(s) (If not included in #6)** \$ \_\_\_\_\_ **Increase for Building Dep.**
  - D. **Depreciation Cost for Equipment (If not included in #6)** \$ \_\_\_\_\_ **Increase for Equipment Dep.**
  - E. **Add Lines #7A, #7B, #7C and #7D = (E)** \$ \_\_\_\_\_ **Adjusted Cost Per Unit Hour**
8. **COST PER UNIT SHIFT = (E) x 8 hours** \$ \_\_\_\_\_ **Cost Per Unit Shift**  
The shift length can be adjusted but we have selected the eight hour shift as a standard shift length
9. **COST PER CALL = (Line 8 divided by Line 4)** \$ \_\_\_\_\_ **Cost Per Call**
10. **OVERALL SYSTEM COST PER CALL:**
  - A. **Line 9 times X %** \$ \_\_\_\_\_ **% Increase for non-transport**  
Take Line 9 times the percentage of your annual ambulance calls that you respond to a location, but do not transport a patient.
  - B. **Line 9 times X %** \$ \_\_\_\_\_ **% CA / Bad Debt Allowance**  
Take Line 9 times your current ambulance collection percentage including Contractual Allowance and Bad Debt amounts (For example, if your gross collection percentage is 60% use 40% as your multiplier).
  - C. **Line 9** \$ \_\_\_\_\_ **Cost Per Call**  
Enter the amount you have on Line 9.
  - D. **Add Lines #10A, #10B and #10C** \$ \_\_\_\_\_ **Adjusted Cost Per Call**
  - E. **Enter Your Profit Margin Per Call** \$ \_\_\_\_\_ **Profit Margin Per Call**
  - F. **Add Lines #10D and #10E** \$ \_\_\_\_\_ **Overall System Cost Per Call**  
This line should help to verify the minimum amounts which should be billed for each call

Unit Hour Analysis Worksheet  
Instructions

**Line # 1: TOTAL UNIT HOURS PER WEEK = (A)**

A unit hour is an hour in which a vehicle is actually staffed. One unit hour = one ambulance staffed with two providers for one hour. For example:

Staffed Ambulances	# Of Hours per Day	# Of Days per Week	Unit Hours per Week
2	24	7	336
1	12	5	60
1	8	5	40
Total Unit Hours Per Week (A)			436

Calculate only using the number of crews required to staff ambulances. A typical crew consists of 2 persons. However, If you have an extra EMT or Paramedic scheduled on a particular shift, you use should list 1.5 crews. You should also include scheduled volunteer or on-call crews which may respond from home. If a vehicle is staffed, by either paid or volunteer crew on-station or responding from home, you should count those hours in the total Unit Hours per Week.

**Line # 2: AVERAGE CALL VOLUME PER WEEK = (B)**

Take all of your ambulance responses, emergency and non-emergency, including no-transport calls and stand-bys, to identify your total annual responses (all of your "out the door" calls) and divide that number by 52.07 weeks in a year, giving you your Average Call Volume per Week number. Make sure you have removed from your annual responses, those trips that are not ambulance calls (i.e., alternative transportation modes such as wheelchair van, invalid coach, etc.).

**Line # 3: UNIT HOUR UTILIZATION**

Take Line #2 (B), Average Call Volume per Week, and divide that by Line #1 (A), your Total Unit Hours per Week. This gives you the Calls per Unit Hour number which can be converted to a percentage by moving the decimal point two spaces to the right.

**Line # 4: SHIFT UTILIZATION:**

Take your "Calls Per Unit Hour" number and multiply it by 8 hours in a shift, giving you your "Calls Per Unit Shift" number.

**Line # 5: TOTAL EXPENSES PER WEEK = (C)**

List all ambulance related administrative and operational expenses. Make sure you remove any expenses that do not pertain to ambulance calls (i.e., wheelchair or invalid coach expenses, etc.).

**Line # 6: TOTAL EXPENSES PER DAY**

Now that you have your "Total Expenses Per Week", Line #5, take that number and divide it by seven, giving you your "Total Expenses Per Day" number.



**Line # 7 (A to E):****A. COST PER UNIT HOUR: (C) divided by (A)**

\$ \_\_\_\_\_ Cost Per Unit Hour

Take the "Total Expenses per Week", Line #5, and divide it by your "Total Unit Hours Per Week", Line #1, giving you your "Cost Per Unit Hour".

**B. Depreciation Cost for Ambulance(s)**

\$ \_\_\_\_\_ Increase for Vehicle Dep.

*If the depreciation of your vehicle(s) is not included in your "Total Expenses", Line #5, you should calculate that expense and add it here. To get that number, take the cost of a vehicle and divide it by the number of years of depreciation or its "useful life". Then take that number and divide it by 8,760 hours in a year, giving you the "Depreciation Cost per Hour" for that vehicle. Repeat this step for all emergency vehicles you have in service. Add up all the "Depreciation Cost per Hour" totals, giving you the "Increase for Vehicle Depreciation" number.*

**C. Depreciation Cost for Building(s)**

\$ \_\_\_\_\_ Increase for Building Dep.

*If the depreciation of your building(s) is not in your "Total Expenses", Line #5, you should calculate that expense and add it here. To get that number, take the cost of a building(s) and divide it by the number of years of depreciation. Then take that number and divide it by 8,760 hours in a year, giving you the "Depreciation Cost per Hour" for that building. Repeat this step for all the buildings you own. Add up all the "Depreciation Cost per Hour" totals, giving you the "Increase for Building Depreciation" number.*

**D. Depreciation Cost for Equipment**

\$ \_\_\_\_\_ Increase for Equipment Dep.

*If the depreciation of your equipment is not in your "Total Expenses", Line #5, you need to calculate that expense and add it here. To get that number, take the cost of a equipment on your depreciation list and divide it by the number of years of depreciation. Then take that number and divide it by 8,760 hours in a year, giving you the "Depreciation Cost Per Hour" for that piece of equipment. Repeat this step for all the equipment on your service's depreciation list. Add up all the "Depreciation Cost Per Hour" totals, giving you the "Increase for Equipment Depreciation" number.*

E. Add Lines #7A, #7B, #7C and #7D = (E)

\$ \_\_\_\_\_ Adjusted Cost Per Unit Hour

**Line # 8: COST PER UNIT SHIFT**

Take the "Adjusted Cost Per Unit Hour" number, Line #7 (E), and multiply that number by eight hours, giving you your "Cost Per Unit Shift" number. For internal purposes, the number of hours per shift may be modified to match your shift length.

**Line # 9: COST PER CALL**

Take the "Cost Per Unit Shift" number, Line #8, and divided by the "Shift Utilization" number, Line #4, giving you the "Cost Per Call" number.

**Line # 10 (A to F): OVERALL SYSTEM COST PER CALL:****A. Line 9 times X %**

\$ \_\_\_\_\_ % Increase for non-transport

Take Line 9 times the percentage of your annual ambulance calls that you respond to a location, but do not transport a patient.

**B. Line 9 times X %**

\$ \_\_\_\_\_ % Bad Debt Allowance

If your Bad Debt Allowance is not in your "Total Expenses", Line #5, you need to calculate that expense and add it here. Take Line 9 times the percentage of your ambulance calls that are placed into Bad Debt.

**C. Line 9**

\$ \_\_\_\_\_ Cost Per Call

Enter the amount you have on Line 9.

**D. Add Lines #10A, #10B and #10C**

\$ \_\_\_\_\_ Adjusted Cost per Call

**E. Enter Your Profit Margin (Net Revenue) per Call**

\$ \_\_\_\_\_ Profit Margin per Call

Profit is an estimated amount of excess revenue income over the expenses. No business can exist for long unless it earns a profit. Non-Profit organizations should still estimate a profit margin, as long as they reinvest that profit back into the company. Insert projected profit margin on this line.

**F. Add Lines #10D and #10E**

\$ \_\_\_\_\_ Overall System Cost Per Call

This line total is the amount you are to list on the "Cost of Service" Form.

## **EMS In 2015: Demonstrating Value in a Changing Healthcare System**

in Latest Posts, Police & Fire December 24, 2015

By Joseph J. Fitch, PhD; Steve Knight, PhD; Keith Griffiths, PhD

Originally Printed in PM Magazine

Despite a tremendous diversity in how emergency medical services (EMS) are provided in municipalities around the country, most U.S. EMS systems share one commonality: They remain solely focused on responding quickly to serious accidents and critical emergencies even though patients increasingly call 911 for less severe or chronic health problems.

Simply put, the existing EMS response model has failed to evolve as community needs for emergent and nonemergent healthcare delivery have changed. Recent efforts in healthcare to improve quality and reduce costs, such as the Affordable Care Act, pose significant challenges to the existing EMS response model. Healthcare payers have become increasingly unwilling to reimburse for services that fail to prove their value. As a consequence, EMS agencies will soon be required to demonstrate their worth like never before. At the same time, municipalities continue to confront the economic realities of stagnant and even shrinking budgets.

It's critical for city and county managers to know that despite these challenges, the changing healthcare landscape also presents opportunities for EMS systems to evolve from a reactive to a proactive model of healthcare delivery—one that better meets the needs of their communities by preventing unnecessary ambulance transports, reducing emergency department visits, and providing better care at a lower cost.

### **Current Landscape in EMS**

#### **EMS Treatment & Transport**

The standard model for treatment and transport of sick and injured persons by EMS systems has changed very little since the 1960s, when growing pressure to reduce highway deaths and injuries prompted Congress to fund improvements in EMS systems across the country.

While several types of EMS systems exist (See Table 1), most follow the same basic response model. Call-takers and dispatchers obtain critical information and then summon emergency responders to the scene. First responders provide basic medical care until an ambulance arrives. Ambulance personnel then conduct a patient assessment and perform any necessary interventions before transporting the patient to the hospital. If the patient declines transport to the hospital, they are considered to have refused care against medical advice.

The EMS response model continues to emphasize emergency stabilization and rapid transport to the hospital as the primary role of the EMS system. This is true despite evidence that a significant proportion of 911 calls are for non-emergent medical conditions that do not require immediate care and transport.[1],[2] And it ignores the fact that the hospital emergency department is often neither the most appropriate, nor the most cost-effective, destination for patients. This is especially true for patients who are only seeking routine medical care that would otherwise be provided in a physician's office or other non-emergent setting.

For local governments, the growing mismatch between the capabilities of existing EMS systems and the demand from constituents for non-emergent but "unscheduled" medical care represents a failure in service delivery. It also poses a problem of resource utilization; EMS resources such as ambulances are increasingly unavailable for emergencies while they transport non-emergent patients to the hospital. Innovative approaches to EMS delivery are necessary to ensure that EMS systems remain aligned with community needs.

### **Types of EMS Systems**

There are six common models for EMS delivery in the United States: fire service-based, public utility, third government service, private for-profit, private non-profit, and hospital-based.

- 1) Almost half of all EMS systems are based in fire departments. Depending on the system, Fire department ambulances are staffed by "single-role" civilian EMS providers or "dual-role" firefighter/EMTs, who also perform fire suppression functions.
- 2) The public utility model of EMS uses a separate governmental entity to manage emergency medical services in a community, either with a private contractor or by providing the service directly. Local government officials appoint leadership and also approve funding.
- 3) The third-service model provides for the delivery of EMS by a separate department within the existing local government structure. This department exists alongside other public safety departments (police and fire) and employs civilian EMS providers. Funding and day-to-day operations, including support functions, are under the direct control of the local government.
- 4) Private for-profit provision of EMS is characterized by the contracting-out or franchising of EMS to a for-profit provider. Service levels and performance can be specified in the contract but the private contractor often has total control operations.
- 5) The hospital-based model of EMS delivery is also defined by a contractual relationship, in this case between a local government and a hospital (or a local entity associated with a hospital). The hospital-based entity is often a non-profit and may require a government subsidy. As in the private for-profit model, however, the local government has limited day-to-day influence over operations.
- 6) In the private non-profit model, community-based or volunteer agencies provide emergency medical services that are subsidized by a combination of government funding, donations, or user fees.

These organizations are self-governing and exercise complete control over day-to-day operations. They may use volunteers, paid personnel, or a combination of the two to staff ambulances.

### **Funding**

EMS systems (whether public or private) receive very little in the way of federal or state subsidies. Consequently, most EMS systems seek to offset their operating costs by billing patients for transport to the hospital.[3] This “fee-for-transport” funding scheme is based on the federal government’s reimbursement model for Medicare and Medicaid patients, which has also been adopted by most private payers.

Unfortunately, seeking reimbursement for transport to the hospital has proven insufficient to cover the costs associated with EMS delivery. Reimbursement rates for ambulance transport of Medicare and Medicaid patients (who account for approximately 60% of patients transported by EMS agencies) have consistently failed to match the cost of service.[4] The resulting shortfalls have been only partially subsidized by reimbursements from private payers, as patients with private insurance account for less than a quarter of patients transported to the hospital by EMS agencies.[5]

The current fee-for-transport model of EMS funding also does not adequately account for the non-transport costs of EMS delivery, including the cost of medical care rendered to patients by EMS providers, the cost of caring for patients who ultimately decline ambulance transport to the hospital, and the “cost of readiness” associated with maintaining the capability to quickly respond to medical emergencies on a 24/7 basis. The result is that EMS agencies have a financial incentive to transport all patients to the hospital regardless of medical necessity—even if only to recoup a small portion of the overall costs associated with providing emergency medical services.

As a consequence, most local governments find themselves in the position of having to directly subsidize their EMS system. This is the case even in communities where ambulance transport is provided by private contractor. For local governments then, especially those still grappling with revenue shortfalls, the EMS system is yet another significant cost to be managed; one that must be carefully aligned with the particular priorities and needs of each community.

### **Challenges**

#### **How to Demonstrate Cost-Effectiveness**

##### **Response times**

EMS systems have often sought to demonstrate their effectiveness by measuring the time it takes for a responding unit to arrive at the scene of an emergency. Specifically, most urban systems have adopted a goal of 4 minutes for a basic life support (BLS) unit to arrive at the scene; and 8 minutes for an advanced life support (ALS) unit to arrive.[6]

The origins of these response time goals can be found in early research on out-of-hospital cardiac arrest, which showed an improvement in patient outcomes if CPR was initiated within 4 minutes and defibrillation was delivered within 8 minutes.[7] More recent research, however, has called into question the value of using response times to measure EMS system performance. Very short response times (4-5 minutes) may increase survival for certain life-threatening conditions (such as cardiac arrest and allergic reactions), but other differences in responses time (e.g., the difference between 6 and 10 minutes) likely do not result in better patient outcomes.[8] Consequently, each community's response time standards goals should reflect a careful balancing of medical necessity and community expectations on the one hand, and community resources and attributes (e.g., urban vs. rural) on the other.[9]

Some strategies for safely increasing response time standards in a community include:

- Allowing for longer ambulance response times if a first responder (often a basic life support unit staffed by the fire department) is able to arrive within the first several minutes and provide initial management and stabilization of a patient.

- Establishing different response time standards depending on the nature of the medical emergency or the severity of the patient's medical condition.

#### **Unit hour utilization**

EMS systems have also looked to measure productivity as a proxy for system efficiency. One commonly used measure is unit hour utilization (UHU), a ratio that is typically calculated by dividing the number of transports by the number of unit hours.[10] In other words, an ambulance that performs four transports in a 12-hour shift has a UHU of 4/12, or 33%. However, some agencies will calculate UHU by using the total number of hours that EMS units are engaged on calls by the total number of hours that those units are staffed and fully-equipped. Neither method is right or wrong, and each have advantages—an agency worried about recouping costs might want to focus on transports, while an agency more concerned with staff performance and preparedness levels would be more concerned with the percentage of time ambulances are available.

Unit hour utilization varies greatly among EMS systems, and there is no generally-accepted consensus regarding the ideal ratio. EMS agencies responding solely to 911 calls typically target a lower unit hour utilization (between 0.30 and 0.50 UHU) than nonemergency ambulance transport providers—in order to ensure that a sufficient number of units remain available to respond to emergency calls. Agencies whose providers work longer shifts, such as 24 hours, also often aim for lower UHUs due to concerns over fatigue and safety.

It is important to note that unit hour utilization traditionally does not capture productivity outside of responding to emergency calls, such as the completion of required documentation and training. Moreover, if unit hour utilization is measured simply on the basis of the number of patient transports during a specified period, the resultant UHU will also fail to capture the time spent responding to emergency calls that do not result in patient transports. Finally, increased unit hour utilization can result in provider fatigue and medical errors, especially in EMS systems that have 24-hour shifts.

## **Shift schedules**

Personnel costs account for the majority of an EMS system's budget. Accordingly, the staffing model employed by a system is a key factor. Several different models have been adopted by EMS agencies across the country, each reflecting the unique needs and priorities of particular EMS systems. However, four staffing models predominate.

Twenty-four-hour shifts are most prevalent in fire-based EMS systems. The 24-hour shift model allows for the easiest integration between fire and EMS shifts and is best-suited for low-volume systems that prioritize reliable response times.[11]

The 12-hour shift is most frequently the choice of private or third-service EMS systems, particularly those that serve large cities. This model allows for increased productivity (in order to meet the demands of high-volume systems) while taking into consideration the provider fatigue that is associated with longer work hours.[12],[13]

Lastly, 8-hour and 10-hour shift staffing models have been adopted by several high-volume EMS systems. These models allow for the highest level of productivity during each shift in addition to providing the greatest flexibility for dynamic and peak-time deployment of EMS units.[14] However, they require more staffed positions than the other models and have been associated with higher employee turnover and possibly increased overtime costs due to the greater number of shift changes each day.

## **Healthcare Reform**

### **Triple Aim**

Over the last decade, economists and policymakers have largely abandoned the belief that better health outcomes could only be achieved through increased spending. Instead, many changes to the healthcare system, including some of those created by the Affordable Care Act, are now based on the "triple aim," which states that it is possible to simultaneously improve the patient experience, reduce healthcare costs, and improve the population's health.[15]

Proponents of the triple aim argue that by reducing inefficiencies, coordinating services, and providing evidence-based, patient-centered care, costs can be reduced by eliminating redundancies and avoiding unnecessary tests, procedures, and other healthcare spending. This model also shifts the focus of healthcare to prevention and education, with the belief that spending money to prevent injury, illness, and chronic disease will decrease the high costs associated with treating those problems once they occur.

### **Fee for quality vs. fee for service and value-based payments**

Concerns over the fee-for-service model and its incentives have given rise to value-based reimbursements and the fee-for-quality model. While these changes have yet to impact EMS directly, hospitals and other healthcare providers are already seeing changes to how they are reimbursed by

CMS, and many EMS leaders across the country have predicted that within a few years, these changes will directly impact EMS payments as well.[16]

In the past, healthcare worked like a restaurant menu: The more you ordered, the more you (or your insurer) paid. Unlike a restaurant, however, consumers often didn't know whether the services were any good, rarely knew the costs, and sometimes didn't know if they had other options. So if they were treated but got sick again a few days later, their physician or the hospital would treat them a second time and charge for the second visit—in some ways, making more money because their initial efforts were unsuccessful, whether that was preventable or not.

In the fee-for-quality model, the goal is to reward providers and hospitals who keep patients healthy and treat problems efficiently and effectively. There are many different combinations of these two models, and the current healthcare system still relies heavily on fee-for-service. However, accountable care organizations are an example of the growing move toward fee for quality, as are Medicare reimbursement penalties (see "Affordable Care Act" sidebar).

In the long run, the hope is that fee-for-quality will produce more savings, as providers try to avoid hospitalizations, ER visits, and severe illnesses, because of their high costs, by focusing on prevention and earlier, less costly interventions. While how these changes will impact EMS remains unclear, what is obvious is that EMS agencies that want to provide high-quality care and want to be reimbursed for that care will have to demonstrate value and prove they enhance the patient experience and improve the population's health.

### **Affordable Care Act**

The Affordable Care Act, in addition to its efforts to expand insurance coverage, also included some changes to the CMS reimbursement system that follow the Triple Aim model. In general, the goal is to incentivize hospitals and physicians to keep patients healthier by no longer rewarding providers for ordering more tests and procedures and keeping patients in the hospital longer. The Affordable Care Act does not discuss emergency care or EMS at length. However, the law still presents challenges and opportunities for the emergency healthcare system, including emergency medical services.

### **Medicare reimbursement**

While Medicare patients only make up a small percentage of the population, they comprise a large percentage of those who are hospitalized and make up a significant chunk of total spending on healthcare in the United States. So when the federal government changes Medicare reimbursement policies, the effect is typically seen across the entire healthcare system.

As part of the Affordable Care Act, Medicare has changed how it reimburses hospitals. One of the most significant changes is that hospitals now receive penalties for high rates of readmission for certain conditions. In the past, when a pneumonia patient who was sent home from the hospital returned two weeks later, the hospital could bill twice for the patient. Now, in an effort to encourage hospitals to ensure the patient is able to remain healthy once they leave the building, that return visit will result in a



penalty. The hope is that hospitals will now spend more time making sure that patients are prepared to go home, by providing adequate discharge instructions and ensuring proper follow-up care (such as doctor's visits, prescription medications, rehab, and home health).

### **Accountable Care Organizations**

The ACA also promoted the formation of Accountable Care Organizations. ACOs are networks of providers, such as doctors and hospitals, that work together to treat a specific group of Medicare patients, similar to HMOs. However, unlike HMOs, patients are not restricted to seeing only providers within the network. Also, ACOs are held accountable to certain benchmarks and quality measures. The goal is that rather than saving money by denying care that will help a patient, ACOs will save money by coordinating care to keep patients healthier and avoid duplication of efforts. Under the ACA, an ACO that demonstrates a certain amount of savings is then eligible to retain some of the savings among the providers and hospitals.

### **Solutions**

#### **Becoming More Cost-Effective**

##### **Strategic prioritization and deployment**

The reality of limited funding and competing priorities requires that local governments think strategically about how best to deploy resources and personnel. This is especially true when it comes to the fire department, whose primary mission has been overtaken by the growing demand for emergency medical services. EMS calls now account for almost 70% of all calls for fire department service, while less than 5% are due to actual fires.[17] As a result, the fire service has increasingly sought to emphasize its role in EMS delivery, in order to both justify continued funding and ensure its future relevance.

Fire departments are arguably well-positioned to deliver emergency medical services. The distribution of fire stations across most communities allows for relatively quick response times. Many fire departments also provide an "all-hazards" capability (including expertise in rescue, extrication, and hazardous materials) that complements the needs of an EMS system. Most importantly, the decline in the number of fires (relative to the population) over the past 30 years has resulted in excess capacity within the fire department that can be re-tasked to provide EMS.[18]

However, the use of fire apparatus to transport dual-role firefighters to the scene of a medical emergency is not very cost-effective in terms of maintenance and fuel costs. Neither is upgrading fire apparatus to be advanced-life-support-capable, which also requires the addition of ALS personnel and equipment. Consequently, fire-based EMS systems have begun to explore new deployment models.

Other deployment options that may increase cost-effectiveness include:

Adjusting the number of ambulances placed in service during specific time periods to match anticipated changes in the level of demand during a 24-hour period

Changing the geographic deployment of ambulances over the course of a shift to match anticipated changes in the location of calls for service

### **ALS v. BLS**

In recent years, discussions regarding the cost-effectiveness of an EMS system have increasingly focused on its ability to deliver advanced life support (ALS) care to the community. ALS providers (paramedics and certain intermediate-level providers) are trained to provide advanced emergency care including high-level assessment, complex invasive skills, and a wide range of pharmacological interventions. By contrast, basic life support providers (emergency medical technicians and first responders) are trained to provide preliminary management of emergent patients including basic assessment, non-invasive skills, and a limited set of pharmacological interventions.

Over the past decade, many communities have sought to expand their ALS service, usually by increasing the number of ALS-capable units in the EMS system. In fire-based EMS systems, this has been accomplished by “upgrading” fire apparatus (which formerly served a BLS first-response role) and staffing them with ALS personnel and equipment.

The primary justification for this shift toward ALS first-response has been to reduce the time it takes for an ALS-capable unit to respond to the scene of a call. However, less than half of all EMS calls actually require ALS care and many of the time-critical interventions that were once the domain of ALS providers can now be performed by BLS providers.[19] These now-BLS interventions include defibrillation for cardiac arrest, which was the original impetus for measuring ALS response times but is now routinely delivered by BLS providers and even untrained bystanders.

None of this is to say that ALS providers are not an important part of an EMS system. Certain conditions benefit greatly from ALS care, such as calls for breathing problems.[20] Also, as EMS systems evolve beyond simply providing treatment and transport to the hospital emergency department, the ability of ALS providers to provide advanced assessment and clinical judgment may increase their value on non-critical calls as well.

Increasing the number of ALS providers in an EMS system, however, may actually result in worse quality of care—by reducing each individual provider’s exposure to truly critical patients and limiting opportunities to maintain proficiency through the regular performance of advanced interventions.[21]

A cost-effective EMS system will have a mix of ALS and BLS resources and reserve limited (and expensive) ALS resources for those patients who stand to benefit most from ALS care. Other factors such as dispatch center capabilities, area geography, call acuity, training resources, community expectations, and political and financial constraints must also be considered when determining the best allocation of ALS and BLS resources in each EMS system.

### **Performance measures**

One of the first steps toward ensuring cost-effectiveness in any EMS system is to measure its performance. Unfortunately, EMS has historically suffered from a lack of generally-accepted clinical

performance .[22] This has made it difficult for EMS systems to evaluate and benchmark the quality of care that they deliver.

In 2007, a group of EMS physicians proposed a set of clinical performance benchmarks.[23] They focused on specific interventions (such as the administration of aspirin for heart attacks) that have been shown to improve patient outcomes for certain conditions. Since then, other organizations have published broader performance measures for EMS systems.[24],[25] The National Association of State EMS Officials (NASEMSO), in partnership with administration (NHTSA), has recently launched an effort to create a new set of evidence-based EMS performance measures that will be completed in 2016.

Use of performance measures in emergency medical services can be problematic, however. Efficiency and output goals, such as response times and unit hour utilization, can fail to provide an accurate representation of EMS system performance. In addition, very few outcome goals exist ("being one example). Nevertheless, performance measures can still provide valuable information regarding an EMS system's success in meeting established objectives and goals and inform decisions regarding staffing levels and deployment models.

### **Data Analysis**

In order to make the most effective use of performance measures, many EMS systems now use commercial data-analysis systems to capture and analyze information on system performance. These systems can access data from several sources including dispatch software, electronic patient care reports, and hospital databases, and then display key performance indicators on data "dashboards" — often in real-time.

As EMS systems evolve, data analysis based on operational and clinical performance measures will become critical. Hospital systems and physicians have already seen reimbursement tied to performance, and many EMS experts suggest a similar model will be applied to EMS payments in the near future. Additionally, for reasons ranging from potential liability to patient and community satisfaction to, ultimately, the quality of patient care, agencies need to have a robust continuous quality improvement (CQI) program that relies on data analysis, sentinel case reviews, and education.

One crucial aspect of any CQI program will be bidirectional sharing of information between EMS agencies and the hospitals (or other healthcare providers) with which they interact. For example, in Sedgwick County, KS, the EMS system has access to a dashboard that pulls information from both the EMS dispatch and patient care reports as well as the hospital medical records, so EMS agency leaders can correlate treatments and assessments performed by prehospital personnel with the ultimate diagnosis and disposition of the patient after delivery to an emergency department.[26]

### **Evidence-based guidelines**

Another way that EMS systems can ensure cost-effectiveness is to focus on delivering clinical interventions that have been proven to work. The field of emergency medical services, however, has

long-suffered from a lack of evidence-based guidelines. Instead, much of EMS practice has been based on limited (and often anecdotal) evidence and an overreliance on expert opinion.[27]

In response to this problem, the federal government has developed a model process for the creation of nationally accepted evidence-based guidelines for emergency medical services.[28] This model has now been applied to develop evidence-based guidelines for several conditions including pediatric seizures, pain management, and severe bleeding. In addition, the National Association of State EMS Officials has recently released national “model” EMS guidelines, which include both evidence-based and consensus-based clinical guidelines.[29]

EMS systems are free to adopt or ignore these new guidelines as they see fit. At the very least, however, EMS systems should review the guidelines in order to inform their own protocols. Interventions that are supported by clinical evidence should be prioritized over those that are not, while still keeping in mind the specific needs and resources of a particular community.

### **Medical oversight**

An EMS system is unlikely to be very effective in the absence of strong medical oversight. Securing the services of a qualified medical director—one who is actively engaged in the EMS system—can be difficult, however. In some communities, physicians who are willing to take on the role of EMS medical director may be in short supply. In others, cost may be a significant obstacle.

Thankfully, an increasing number of emergency physicians interested in medical direction are completing fellowship programs in EMS. In 2010, EMS was accepted as a board-certified subspecialty for physicians with experience or training in EMS medical direction. The first certifications were bestowed in 2014.

If cost is a factor, a local government may seek to contract for specific medical direction services. The National Association of EMS Physicians has adopted a set of recommended qualifications and responsibilities for EMS medical directors, and these may be narrowed down and prioritized as necessary to meet budgetary constraints.[30]

### **Regionalization**

Adopting a regional approach has the potential to significantly improve the cost-effectiveness of EMS systems. Currently, a high level of fragmentation exists, which often results in poor coordination between EMS agencies.[31] This problem of fragmentation is often compounded by incompatible communications systems and inter-agency rivalries. The end result is that neighboring systems may duplicate service, especially in large urban centers, or fail to provide effective service in rural areas.

Local governments should increase the regionalization of EMS delivery wherever possible. Mutual-aid agreements can effectively address both duplication and service shortfalls. Co-locating or consolidating dispatch centers can improve coordination and also generate significant efficiencies. Finally, establishing a regional EMS entity can provide a foundation for increased collaboration between neighboring EMS

agencies (including with respect to funding and resource deployment) and possibly even their eventual consolidation.

### **Call-taking, dispatch, and triage**

The performance of an EMS system is closely tied to the performance of its 911 call center, also known as a public safety answering point (PSAP). Delays in answering, processing, and dispatching EMS calls at a PSAP result in downstream delays in response times, scene times, and transport times—and possibly contribute to worse patient outcomes. Improving the performance of the community PSAPs is another way to increase the cost-effectiveness of EMS systems.

Technological advancements over the past two decades have revolutionized 911 call-taking and dispatch. Most PSAPs now use enhanced 911 (E911) systems, which automatically identify the telephone number and address of 911 callers.[32] In the past several years, E911 systems have been upgraded to include wireless phones in addition to landlines. Efforts are currently underway to expand the E911 system capabilities to also include callers using voice-over-IP services such as Skype and text messaging. Other advanced technologies, such as computer-aided dispatch and automatic vehicle location, have further enhanced the capabilities of PSAPs.

However, it is estimated that almost a quarter of 911 calls are for medical care that does not require emergent transport to the hospital.[33] These calls unnecessarily occupy 911 call takers and emergency dispatchers, and have the potential to delay the dispatch of EMS units to true medical emergencies.

Public education efforts have done little to stem the growing tide of 911 calls for nonemergent medical conditions.[34] Some communities are now piloting programs that will allow PSAPs to more effectively manage the increasing volume of calls for both emergency and nonemergency medical services. One example is the use of nurses at a PSAP to provide advanced medical triage.

Employing nurses to triage nonemergency medical calls can free up call takers and dispatchers to focus on calls for emergency service. PSAP nurses can refer nonemergency callers to more appropriate healthcare resources (e.g., an urgent care center or clinic) and also improve EMS system efficiency by allowing dispatchers to prioritize calls for service based on medical urgency and potentially even schedule an ambulance to respond during periods of lower demand.

### **Taking Advantage of Opportunities: Mobile Integrated Healthcare and Community Paramedicine**

The concept of community paramedics—EMS providers who provide a broader array of services and focus on prevention and primary care—is not a new one, but it has gained renewed focus in recent years, thanks in large part to the advent of the Triple Aim philosophy and the ACA.[35]

Community paramedicine means different things to different people within the EMS community. In more rural locations, community paramedicine initially developed as a way to provide basic primary care services in areas with limited medical resources and to avoid long, expensive trips to distant hospitals for minor problems. In this setting, community paramedics often had a scope of practice beyond that of most other paramedics, which might include wound care, suturing, and even antibiotic administration.

Urban and suburban communities, realizing that it is in the best interest of both patients and community health to prevent illnesses and hospitalizations whenever possible, have begun to experiment with a new type of community paramedicine, which some are now calling “mobile integrated healthcare.”

Mobile integrated healthcare (MIH) is broader than community paramedicine in that it contemplates using providers and organizations of all types to provide the best care in the home and other nonclinical environments.[36] Accordingly, most community paramedicine programs can fall under the umbrella of mobile integrated healthcare, but not all MIH programs necessarily use the community paramedic model.

MIH programs often employ EMS providers who receive advanced training on topics such as chronic disease management and mental health issues, but whose technical and medical scope of practice remains unchanged.

The passage of the Affordable Care Act has contributed to a significant increase in the number of EMS agencies providing MIH services across the country. Some have been subsidized by EMS agencies and fire departments that hope to decrease the demand on emergency services. Others have attempted to capitalize on changes to the Medicare reimbursement model and have partnered with hospitals to reduce readmissions, hoping hospitals will want to pay for the service in order to avoid Medicare penalties.

Among some EMS leaders, there is a concern that EMS agencies are diving headfirst into MIH without a clear path to sustainability. At the same time, however, there is also growing agreement that the current EMS response and funding model is not sustainable. Local government should therefore assess the available resources and the financial, political, and regulatory climate before deciding which type of MIH program, if any, is appropriate in their particular communities. In any case, MIH programs will not eliminate the need for emergency response or the use of EMS as a safety net by some members of the community.

### **Typology of MIH Programs**

Much like EMS systems, almost no two MIH programs look exactly alike (Table 2 includes examples of MIH programs from across the United States). However, there are several categories of services that generally encompass the bulk of MIH activities:

**Physician extender.** These programs place EMTs, paramedics, or mid-level practitioners (e.g., nurse practitioners, physician assistants) in the community to provide medical services that do not require hospitalization. This could include treating minor injuries with suturing or evaluating minor illnesses and providing medications.

**Adjunctive mobile care.** Programs that are created to fill gaps in the community—often to avoid unnecessary hospital visits—include re-admission avoidance, hospice revocation avoidance, and post-discharge care. Typically, these programs involve a home visit by the EMS provider, who reviews

discharge instructions, does an in-home assessment, reconciles medication lists, and ensures patients are following up with a primary care provider or appropriate specialist.

**Patient triage and navigation.** Traditionally, EMS systems have provided patients with two options—either a transport to the emergency room, or nothing. Several agencies are now exploring other options, both to improve the patient experience and to decrease the burden on emergency medical resources. These programs include connecting 911 call centers to nurse help lines for low-acuity illnesses and injuries; allowing EMS responders to treat and release patients on scene or transport them to facilities other than hospitals, such as behavioral health facilities, urgent care clinics, or detox centers; and addressing frequent EMS users through education, linkage to other resources, and other interventions.

**Occupational and community health services.** These programs may include education and outreach efforts, such as fall prevention education for elderly members of the community; on-site injury assessment at workplaces to avoid unnecessary trips to the emergency department and associated costs; and immunizations.

### **Examples of CP/MIHP Programs**

#### **MedStar (Fort Worth, Texas)**

In 2013, MedStar EMS, the sole provider of nonemergency and emergency ambulance services in Fort Worth and 14 other surrounding cities, changed its name to MedStar Mobile Healthcare. The new moniker reflects a realization in the EMS community that even many 911 calls do not result in “emergency care” so much as “unscheduled healthcare.”

MedStar has been one of the most aggressive innovators in the realm of mobile integrated health. As a public utility system, MedStar has a government-mandated monopoly on services but also the flexibility to adapt. MedStar has launched several community health programs in recent years, many of which highlight the importance of partnerships to ensuring positive patient outcomes and fiscal sustainability.

Specially trained mobile health paramedics, who use vehicles that are not equipped to respond to emergencies, perform in-home visits with frequent 911 callers, recently discharged Medicare patients, and others who may be at risk of becoming an EMS or emergency department patient in the future. The agency has also partnered with local hospice and home health agencies as well as insurers and hospitals. These partners pay MedStar to provide these mobile health services in order to prevent patients from having further hospitalizations.

#### **Mesa Fire and Medical (Mesa, Arizona)**

Like MedStar, the Mesa Fire Department recently acknowledged the shifting priorities of the fire service by changing its name to the Mesa Fire and Medical Department. The department also received a \$12.5 million Center for Medicare and Medicaid Innovation (CMMI) grant to expand its Community Care Units program, which partners paramedics with other healthcare providers to provide appropriate care to patients and free-up other resources to respond to emergency calls.

The department's Community Care Units look like ambulances, but each varies in how it is staffed. One unit partners a paramedic with a nurse practitioner or physician assistant, who is employed by Mountain Vista Medical Center. That mid-level practitioner can often handle low-acuity emergencies by prescribing a medication, treating someone's pain, or even suturing a wound in the field, preventing an unnecessary ambulance ride and emergency department visit.

A second unit partners a paramedic with a crisis counselor to respond to behavioral and determine if the patient might be better served at a psychiatric facility rather than the emergency room. Partnering with these other healthcare providers has allowed the department to expand the scope of services it can provide in the field.

### **REMSA (Reno, Nevada)**

Before Mesa received its federal grant, REMSA was the recipient of the largest CMMI award to an EMS agency. REMSA, a public utility EMS agency in Reno and surrounding Washoe County, Nevada, launched a nurse health line, a community paramedic program, and an alternative destination program, all funded by the CMMI grant.

REMSA felt its patients often had a simple question or problem but turned to 911 because they did not know who else to call. And public safety dispatch centers were designed to handle emergencies, so the response was always the same: dispatch EMS. REMSA established a nurse health line for people to call, regardless of their insurance status or provider. The nurses were trained to provide advice over the phone and to recognize serious emergencies. Unlike other nurse hotlines, REMSA's is directly tied to the EMS dispatch center, so calls can be seamlessly referred between the two. Calls coming into 911 for very low-acuity issues are transferred to a nurse, often eliminating the need for EMS response.

The alternative destination program allows REMSA's EMS providers to take patients to destinations other than emergency departments, such as urgent care clinics. Many of the patients have minor illnesses and injuries that can be handled by these clinics, decreasing the cost of care and relieving stress on the emergency system.

### **Wake County EMS (Raleigh, North Carolina)**

In Wake County, North Carolina, the public "third service" agency that provides 911 EMS response and transport added a new level of provider: the advanced practice paramedic (APP). These APPs receive additional training and supplement the emergency response system, ensuring the presence of an additional, experienced paramedic on critical incidents. But the main success of the program has been when the APPs conduct in-home visits with frequent callers and patients who are referred by other EMS providers who feel the patient needs additional services.

In addition, Wake's advanced practice paramedics are able to medically clear intoxicated patients so they can be taken directly to a detox facility, preventing the utilization of an ambulance and hospital bed for a person without a medical need for either. Similarly, they can evaluate psychiatric patients in the



field in order to determine the most appropriate destination and get those patients the services they need in a more timely and cost-effective manner.

### **Things to Consider/Potential Obstacles**

#### **Workforce**

The EMS workforce is a critical component of any EMS system, and also a large part of the overall cost of any EMS system. Because EMS delivery models can vary greatly, however, EMS workforces also often differ in terms of required qualifications, promotional opportunities, and labor representation.

Fire-based EMS systems typically have the highest personnel costs, due to higher salaries, generous pensions, and 24-hour shift schedules for dual-role firefighters. EMS systems that employ single-role EMTs and paramedics often pay smaller salaries but also generally experience high turnover rates.

Organized labor is more prominent in fire-based systems, as the International Association of Fire Fighters (IAFF) has become one of the nation's largest and most politically active unions. Civilian EMS providers who are unionized are represented by a wide range of different labor groups across the country.

Maintaining a dialogue with the workforce—whether organized or not—is critical for local governments seeking to make changes to their EMS systems. Strong opposition from labor can sink proposed changes before they are even proposed. This is especially true for changes to pay levels or shift schedules, as was evident when the (now former) fire chief in Washington, D.C., proposed switching from 24-hour shifts to shorter work periods as a potential cost-saving measure.[37]

Whether considering a new mobile integrated health program or simply trying to improve upon existing EMS services, it is critical that municipalities and EMS agencies evaluate and assess the community's needs first.[38] Programs that are created simply to increase revenue or copy another community's model may not be appropriate and are likely to struggle or fail. The process of conducting a needs assessment will vary depending on the size of the community, the available resources, and the types of changes being considered, but every needs assessment should include dialogue with community stakeholders in order to determine what service gaps exist.

Without assessing community needs, it is quite likely that a community will establish a program that is redundant or unnecessary. As noted earlier, several EMS agencies across the country have established programs to address frequent users of 911 services. In San Diego, an analysis of those users determined that many of them had alcohol or substance abuse problems in addition to being chronically ill and sometimes homeless. In McKinney, Texas, however, the local EMS agency found that most of its frequent callers were elderly and had chronic conditions, but very few had substance abuse problems and almost none were homeless.[39] The resources needed to address the problems in these two cities are vastly different, and only through assessing the problem and the existing resources were the two cities able to establish programs.

## **Regulatory Environment**

As EMS agencies look for ways to improve service and adapt to a new healthcare environment, states have struggled to keep pace with the changes happening at the local level. Because many state EMS regulations limit paramedics' and EMTs' scopes of practice to "emergency situations," some programs aimed at prevention and patient navigation have stalled. States with a less stringent EMS regulatory structure, such as Texas, have seen a rapid growth in these programs; other states have taken a slower approach, as in California, where EMS regulators plan to dip their toes in the water with a handful of state-approved pilot programs.[40]

In Minnesota, a lobbying effort led to legislative recognition of community paramedics and the services they provide in 2011. Minnesota remains the only state where community paramedic services are specifically recognized and reimbursed by the state's Medicaid system. Most states still lack a regulatory definition of a community paramedic or an advanced practice paramedic, and prehospital providers filling these roles are certified at the EMT or paramedic level with no state-recognized expanded scope of practice.[41]

While responsibility for regulation of EMS lies with the states, federal agencies have shown support of innovative EMS programs. The Center for Medicare and Medicaid Innovation (CMMI), created by the Affordable Care Act, has awarded several multi-million-dollar grants to support EMS agencies' community health programs (see sidebar). The three agencies most involved in EMS issues also published a draft white paper entitled "Innovation Opportunities for Emergency Medical Services," in which they suggest that EMS could play a major role in improving the effectiveness and efficiency of the healthcare system by considering alternatives to the traditional model of transporting every patient to the emergency department.[42]

## **Potential Partners**

### **Insurance companies**

Private payers for healthcare services have an obvious incentive to partner with EMS systems that are able to provide cost-effective healthcare services under the umbrella of community paramedicine. EMS systems that offer preventive health services, mobile care (such as home visits to patients with chronic conditions), and patient navigation (such as transport to a local clinic) may also find that insurance companies are willing to subsidize their services.

### **Hospitals**

Hospitals have a particular incentive to partner with EMS systems that offer services aimed at reducing hospital readmissions. Since October 2012, the federal government has imposed financial penalties on hospitals with "excessive" readmissions for certain conditions.[43] In order to avoid such penalties, hospitals may be willing to pay EMS systems to provide post-discharge follow-up to their patients.

## **Home health care and hospice agencies**

Home health care and hospice agencies may also have incentives to partner with EMS systems, but only if community paramedicine programs seek to complement rather than compete with their own services. For example, home health care and hospice agencies may be willing to compensate EMS systems for triaging and providing care to their patients who call outside of their normal operating hours.

## **Funding Models**

### **Public and private subsidy**

Community paramedicine programs are unlikely to be entirely self-sustaining. Their true worth, however, should be judged in terms of their impact on the cost-effectiveness of the overall EMS system. If such programs are able to help EMS systems more efficiently manage the ever-increasing demand for emergency medical services, then a certain level of local government funding may be appropriate. This is also true for community paramedicine programs that are successful in addressing currently unmet community healthcare needs.

It is likely that public healthcare payers at the state and federal levels (e.g., Medicare and Medicaid) may eventually offer some level of public subsidy for community paramedicine services. Thus far, however, they have focused their efforts on grant funding for pilot projects.

Private healthcare payers, hospitals, certain private healthcare providers may also directly subsidize certain community paramedicine services provided by EMS agencies.

### **Fee for service**

It will be difficult for community paramedicine programs to seek direct reimbursement from healthcare payers on a fee-for-service basis. Existing billing codes simply do not contemplate the provision of healthcare services by EMS providers. Efforts to expand their scope to include community paramedicine services have met with very limited success.

### **Shared savings and capitated payment**

The shared savings model offers the greatest potential for private funding of community paramedicine services. EMS systems that are able to demonstrate cost savings to private healthcare payers or hospital systems (e.g., reduced healthcare costs from patient navigation or reductions in financial penalties due to readmission avoidance efforts) may be able to enter into an arrangement whereby they share in those cost savings. The shared savings model is likely to become more appealing as the healthcare system moves away from fee-for-service reimbursement toward population-based payment models.

In healthcare and government, providing high-quality service and being cost-effective are no longer thought to be mutually exclusive. Emergency medical services in the United States are at a crucial juncture, as the public continues to demand prompt, effective response; municipal budgets are strained; and ambulance reimbursements decrease. EMS systems must prepare for a future when simply responding to every call with lights and sirens and transporting every patient to the hospital emergency department is no longer a sustainable model. While the path forward is still not entirely clear, systems that adopt an evidence-based and patient-centered approach, consider innovative ways of providing traditional 911 EMS service, and take advantage of new opportunities to provide appropriate nonemergency services to their communities, will be well-positioned to effectively—and efficiently—respond to the changes coming to healthcare and EMS in the United States.

#### **Citations:**

- [1] Institute of Medicine Committee on the Future of Emergency Care in the US Health System. "Emergency medical services: at the crossroads." Washington: DC (2006).
- [2] "Innovation Opportunities for Emergency Medical Services: A Draft White Paper from the National Highway Traffic Safety Administration (DOT), Office of the Assistant Secretary for Preparedness and Response (HHS), Health Resources and Services Administration (HHS)," July 15, 2013, accessed October 20, 2014, [http://ems.gov/pdf/2013/EMS\\_Innovation\\_White\\_Paper-draft.pdf](http://ems.gov/pdf/2013/EMS_Innovation_White_Paper-draft.pdf).
- [3] National EMS Advisory Council, "EMS system performance-based funding and reimbursement model," May 31, 2012, accessed October 20, 2014, <http://www.ems.gov/nemsac/FinanceCommitteeAdvisoryPerformance-BasedReimbursement-May2012.pdf>.
- [4] Ibid.
- [5] Ibid.
- [6] National Fire Protection Agency Standard 1710, "Standards for the organization and deployment of fire suppression operations, emergency medical operations, and special operations to the public by career fire departments" updated 2010.
- [7] Eisenberg, Mickey S., Lawrence Bergner, and Alfred Hallstrom. "Cardiac resuscitation in the community: importance of rapid provision and implications for program planning." JAMA 241, no. 18 (1979): 1905-1907.
- [8] Blackwell, Thomas H., "EMS Response Time Standards," in Evidence-based System Design White Paper for EMSA, eds. J.M. Goodloe and S.H. Thomas (2011), 18-29, accessed October 20, 2014, <http://www.naemsp.org/MDC%20References%20for%20Website/OUDEM%20EMS%20System%20Design%20White%20Paper%20FINAL%20for%20July%202011%20Release.pdf>.
- [9] Bailey, E. David, and Thomas Sweeney. "Considerations in establishing emergency medical services response time goals." Prehospital Emergency Care 7, no. 3 (2003): 397-399.

- [10] Fitch and Associates, "How to Explain UHUs from UFOs to Your City Manager," EMS1.com, November 8, 2012, accessed October 20, 2014, <http://www.ems1.com/ems-management/articles/1365144-How-to-explain-UHU-from-UFOs-to-your-city-manager>.
- [11] Miramonti, Charles, "Scheduling Deployment Models," in Goodloe and Thomas, Evidence-based System Design, 40-53.
- [12] Ibid.
- [13] International Association of Fire Chiefs, "Effects of sleep deprivation on firefighters and EMS responders," June 2007, accessed October 20, 2014, [http://www.iafc.org/files/progssleep\\_sleepdeprivationreport.pdf](http://www.iafc.org/files/progssleep_sleepdeprivationreport.pdf).
- [14] Miramonti, Charles, "Scheduling Deployment Models."
- [15] Berwick, Donald M., Thomas W. Nolan, and John Whittington. "The triple aim: care, health, and cost." *Health Affairs* 27, no. 3 (2008): 759-769.
- [16] Matt Zavadsky, "Get Ready for Value-Based Purchasing," *EMS World*, June 2014, 16-17.
- [17] National Fire Protection Administration, "Fire Department Calls," September 2014, accessed October 20, 2014, <http://www.nfpa.org/research/reports-and-statistics/the-fire-service/fire-department-calls/fire-department-calls>.
- [18] Fahy, Rita F., Paul R. LeBlanc, and Joseph L. Molis. "What's changed over the past 30 years?." *National Fire Protection Association* (2007): 1-15.
- [19] Eckstein, Mark K., "Basic and advanced life support considerations," in Goodloe and Thomas, Evidence-based System Design, 30-39.
- [20] Stiell, Ian G., Daniel W. Spaite, Brian Field, Lisa P. Nesbitt, Doug Munkley, Justin Maloney, Jon Dreyer et al. "Advanced life support for out-of-hospital respiratory distress." *New England Journal of Medicine* 356, no. 21 (2007): 2156-2164.
- [21] Pouliot, Ryan C. "Failed prehospital tracheal intubation: a matter of skill dilution?." *Anesthesia & Analgesia* 110, no. 5 (2010): 1507-1508.
- [22] Myers, J. Brent, Corey M. Slovis, Marc Eckstein, Jeffrey M. Goodloe, S. Marshal Isaacs, James R. Loflin, C. Crawford Mechem, Neal J. Richmond, and Paul E. Pepe. "Evidence-Based Performance Measures for Emergency Medical Services Systems: A Model for Expanded EMS Benchmarking: A Statement Developed by the 2007 Consortium US Metropolitan Municipalities' EMS Medical Directors." *Prehospital Emergency Care* 12, no. 2 (2008): 141-151.
- [23] Ibid.

- [24] National Highway Traffic Safety Administration, "Emergency medical services performance measures: Recommended attributes and indicators for system and service performance," December 2009, accessed October 20, 2014, <http://www.ems.gov/pdf/811211.pdf>.
- [25] International Association of Fire Fighters & International Association of Fire Chiefs, "EMS system performance measurement: Operations manual," accessed October 20, 2014, <http://www.iaff.org/tech/PDF/EMSSystemPerformanceMeasurement.pdf>.
- [26] Todd Stout, "Enhancing the Healthcare Continuum: How I.T. Solutions Can Help EMS & Hospitals Collaborate," presentation at Pinnacle EMS Leadership Forum, July 21, 2014.
- [27] Lang, Eddy S., Daniel W. Spaite, Zoe J. Oliver, Catherine S. Gotschall, Robert A. Swor, Drew E. Dawson, and Richard C. Hunt. "A National Model for Developing, Implementing, and Evaluating Evidence-based Guidelines for Prehospital Care." *Academic Emergency Medicine* 19, no. 2 (2012): 201-209.
- [28] Brown, Kathleen M., Charles G. Macias, Peter S. Dayan, Manish I. Shah, Tasmeen S. Weik, Joseph L. Wright, and Eddy S. Lang. "The development of evidence-based prehospital guidelines using a GRADE-based methodology." *Prehospital Emergency Care* 18, no. Supplement 1 (2014): 3-14.
- [29] National Association of State EMS Officials, "National Model EMS Clinical Guidelines," September 15, 2014, accessed October 20, 2014, <https://www.nasemso.org/Projects/ModelEMSClinicalGuidelines/documents/National-Model-EMS-Clinical-Guidelines-15Sept2014.pdf>.
- [30] Alonso-Serra, Hector, Donald Blanton, and Robert E. O'Connor. "Physician medical direction in EMS." *Prehospital Emergency Care* 2, no. 2 (1998): 153-157.
- [31] Institute of Medicine, "Emergency medical services: At the crossroads."
- [32] National Emergency Number Association, "9-1-1 Statistics," September 2014, accessed October 20, 2014 <https://www.nena.org/?page=911Statistics>.
- [33] Alpert, Abby, Kristy G. Morganti, Gregg S. Margolis, Jeffrey Wasserman, and Arthur L. Kellermann. "Giving EMS flexibility in transporting low-acuity patients could generate substantial Medicare savings." *Health Affairs* 32, no. 12 (2013): 2142-2148.
- [34] Linda J. Johnson and Beth Musgrave, "Non-emergency ambulance runs burden, add to the cost of Lexington's EMS system," *Lexington Herald Leader*, February 15, 2014, accessed January 11, 2015, [http://www.kentucky.com/2014/02/15/3089002\\_911-frequent-flyers-non-emergency.html](http://www.kentucky.com/2014/02/15/3089002_911-frequent-flyers-non-emergency.html).
- [35] Krumperman, K. "History of community paramedicine." *EMS Insider* 14651 (2010), <http://www.jems.com/article/ems-insider/history-community-paramedicine>.
- [36] Mobile Integrated Healthcare Practice Collaborative, "Principles for Establishing a Mobile Integrated Healthcare Practice," Medtronic Philanthropy, 2014.

[37] Alan Suderman, "Shorter Firefighter Shifts Still a Ways Off, Like Maybe Forever," Washington City Paper, October 31, 2012, accessed October 20, 2014, <http://www.washingtoncitypaper.com/blogs/looselips/2012/10/31/shorter-firefighters-shifts-still-a-ways-off-like-maybe-forever/>.

[38] Mobile Integrated Healthcare Practice Collaborative, "Principles."

[39] Michael Gerber, "How 4 Cities are Making Community Paramedicine Work for Them," EMS1.com, July 22, 2014, accessed October 20, 2014, <http://www.ems1.com/community-paramedicine/articles/1949030-How-4-cities-are-making-community-paramedicine-work-for-them/>.

[40] Alex Matthews, "The Paramedic Will See You Now," California Health Report, August 28, 2013, accessed October 20, 2014, <http://www.healthycal.org/archives/13434>.

[41] "Beyond 911: State and Community Strategies for Expanding the Primary Care Role of First Responders," NCSL, accessed October 19, 2014, at <http://www.ncsl.org/research/health/expanding-the-primary-care-role-of-first-responder.aspx>.

[42] "Innovation Opportunities for Emergency Medical Services."

[43] Centers for Medicare & Medicaid Services, "Readmissions Reduction Program," August 4, 2014, accessed October 20, 2014, <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html>.

