

# Value Generation and Health Reform in Emergency Medical Services

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EMS: Emergency Medical Services  
ED: Emergency Department

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## Abstract

American Emergency Medical Services (EMS) agencies largely have been untouched by the dramatic health care reform efforts underway, although change seems imminent. Clarifying the role of the modern EMS system, and the yardsticks used to evaluate its performance, will be a challenge.

This paper introduces the concept of value (or outcomes to cost ratio) in EMS, and offers value assessment as a means by which reform decisions can be framed. The best reform decisions are those that optimize both costs and outcomes. This includes: (1) attention to the patient experience; (2) disallowing the provision of unhelpful, harmful or disproven prehospital care; and (3) expanding patient dispositions beyond Emergency Departments. Costs of care will need to be tracked carefully and acknowledged. Value generation should serve as the goal of ongoing EMS reform efforts.

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## Introduction

In 2012, the United States finds itself a decade into a national campaign to improve the quality of its health care. Quality, effectiveness and cost have defined American health care reform efforts. They also have become a key focus for leaders across the health care industry – from acute care hospitals to skilled nursing facilities. It is curious, then, that despite the rapid pace of change in other fields of medicine, fundamental changes to the traditional model of American EMS care have been slow to emerge. If other fields of medicine serve as harbingers, EMS quality and cost will soon be subject to unprecedented scrutiny by increasingly sophisticated payers and regulators demanding more accountability for their dollars.

One barrier to change seems to be a lack of clarity concerning the goals of EMS reform, and uncertainty about how to weigh the merits of different paths forward. In my previous role as a state EMS Medical Director, I often was responsible for leading discussions about scopes of practice and oversight of care. During these discussions, it seemed that we often needed a touchstone to guide the evolution of our state's EMS system. In trying to make decisions about new types of medical care, it was sometimes unclear how our state's leadership team should balance often-competing interests such as technologic innovation, dollar cost, incremental benefit, patient safety and opportunity cost. Clarity regarding the ultimate goal of our decision-making processes was lacking in these discussions.

One concept—ensuring maximal patient value as the goal of leadership decisions—gradually emerged as a means to organize and prioritize conflicting interests. In this discussion, I raise the concept of value (or outcomes to cost ratio) in EMS, and argue that value generation should serve as the goal of ongoing EMS reform efforts. National and state level EMS leaders can use this concept of value assessment to frame difficult leadership decisions.

## Value in Health Care

Over a decade ago, the Institute of Medicine published two reports that outlined glaring problems with health care quality and patient safety in the United States. The reports, *To Err is Human: Building a Safer Health System*<sup>1</sup> and *Crossing the Quality Chasm: A New Health System for the 21st Century*,<sup>2</sup> introduced a new era of concern about health care quality in America. Since then, U.S. health care has been subject to quality metric reporting, “pay-for-performance,” and new incentive programs driving electronic

record adoption. All these measures have been efforts to improve transparency, standardize processes and reduce costs.

Most recently, the generation of value in medicine has been the primary goal of health reformers. Value is a function of both outcomes (versus rote adherence to processes of care) and cost for medical services. Harvard economist Michael Porter, a leading scholar in this area, stratifies outcomes into hierarchies to include measures such as survival, degree of recovery, time to recovery, disutility of care, sustainability of health and long-term consequences of therapy. He defines value as health care outcomes achieved per unit of resources spent.<sup>3</sup> Cost is the amount spent on medical care during an episode of illness. For Porter, patient-determined value (and not process) is the key metric by which health care should be measured. Did the care that was delivered make a difference? If so, what degree of difference did it make? How was the health care experience from the patient's perspective? Did patients wait a long time for a diagnosis, or suffer needlessly? Was there a good outcome for the money spent? Porter's hierarchies, along with sample possible outcomes for each, as applied to a hypothetical patient with myocardial infarction receiving care by EMS, are shown in Table 1.

The generation of value in American EMS remains a thorny problem, despite the fact that, as a whole, the EMS system excels in providing consistent processes of care. Owing to highly protocol-driven structures, EMS providers perform well when it comes to following pre-determined care pathways. For example, paramedics at most services will administer aspirin for cases of chest pain and apply pulse-oximeters for cases of respiratory distress with excellent reliability. This provision of consistent care is one of the holy grails of the quality movement, which holds that minimizing variation in care is critical to reducing costs while accurately tracking performance over time.

Indeed, the problem with EMS quality is not consistency of process, but the fact that some services are providing the wrong care consistently. Not enough thought has been paid to outcomes in EMS, and this is the Achilles heel of the profession. Defining and determining outcomes remains a difficult problem, one that the Emergency Medical Services Outcomes Project group has discussed extensively elsewhere.<sup>4</sup> In general, though, EMS caregivers can contribute to better patient outcomes by focusing on three issues: (1) improving patient care experiences; (2) ceasing care that has been disproven or harmful; (3) improving patient dispositions. Porter would consider the provision of useless or harmful care, providing a poor patient experience and bringing patients to the wrong facility to receive care to be examples of "disutility of care."<sup>3</sup> Examples of poor patient experiences include neglecting to control pain, keeping patients on unneeded and painful backboards for a prolonged period, or insisting on the insertion of purposeless intravenous catheters. Examples of harmful care include ongoing use of disproven therapies (such as aminophylline, which remains on my state's drug formulary) or the ongoing use of dangerous airway interventions, the safety of which has been disproven in the literature.<sup>5</sup> Inappropriate patient dispositions include bringing a viral upper respiratory infection to the Emergency Department (ED), or a stroke to a close, but low-volume suburban hospital.

A first step in improving outcomes is improving the patient experience. Rather than focus on adding care that is deemed by the patient to be of value, EMS has over the years been more likely to add complex skills, often useful to only a small percentage of patients, to its armamentarium. For example, our

Hierarchy of Outcomes	EMS Examples
(1) Survival	<ul style="list-style-type: none"> <li>Percentage of patients with MI alive at one year.</li> </ul>
(2) Degree of recovery following a medical event	<ul style="list-style-type: none"> <li>Percentage of patients with MI leaving the hospital able to perform usual activities of daily living.</li> <li>The neurologic status of patients receiving airway management.</li> </ul>
(3) Time to recovery	<ul style="list-style-type: none"> <li>Patients with MI demonstrating a shorter convalescent period due to EMS care.</li> </ul>
(4) "Disutility of care," overuse of care, waits, discomfort	<ul style="list-style-type: none"> <li>Objective measurement of pain and nausea experienced by MI patients.</li> <li>Number of unneeded multiple IV catheters placed.</li> <li>Number of patients who receive treatments for MI that are not supported by the medical literature.</li> <li>Patients brought to a PCI lab in an expedited fashion.</li> </ul>
(5) Sustainability of health	<ul style="list-style-type: none"> <li>Early access defibrillation programs</li> </ul>
(6) Injuries from care	<ul style="list-style-type: none"> <li>Hypoxia from incorrectly performed endotracheal intubation.</li> <li>Inappropriate transport of a MI patient to a hospital lacking PCI capability if alternative facilities are reasonably available.</li> </ul>

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**Table 1.** Porter's outcome hierarchies,<sup>3</sup> with examples pertaining to EMS and potential outcomes of interest for a hypothetical patient receiving EMS care for myocardial infarction.

Abbreviations: IV, intravenous; MI, myocardial infarction; PCI, percutaneous coronary intervention

state's Medical Direction Committee, which is responsible for guiding the state EMS scope of practice, is regularly approached by services wishing to expand their practices. Over the past few years, it has been petitioned to add rapid sequence intubation, new hemodynamic medications, chest tube insertion, central lines, and the like. There are two issues with this trend. First, it seems clear that complex Advanced Life Support interventions are subject to skills degradation, even while some of them have been researched and found to be unhelpful in the prehospital arena. The Ontario Prehospital Advanced Life Support study group's excellent work in this area, and subsequent work in the area of prehospital intubation by Henry Wang and others, lend a great deal of data to these discussions.<sup>6-9</sup> Equally concerning, however, is the fact that the time, resources and training needed to promulgate these skills comes at the expense of other, less-complex interventions that might generate better outcomes.

Symptom control is an example of this phenomenon: pain and nausea management is clearly an outcome that matters to all patients, and yet we do it poorly.<sup>10,11</sup> We know that prehospital analgesia administration often is inadequate, at least among advanced services where opiate administration is permitted.<sup>12</sup> We also know that nearly all Basic and many Intermediate Life Support providers are unable to administer narcotics, because their level of training is felt to be inadequate for the safe administration of opiates. If we are prepared to dedicate training time and resources to expand existing scopes of practice, are central lines truly what we want to add? Perhaps a better use of resources would be trials such as the one looking at Emergency Medical Technician-Basic intranasal fentanyl administration, currently underway in rural northern New Mexico (Dr. T. Peterson, Taos New Mexico Medical Director, oral communication, March 2011).

Another option for adding value to EMS might be ensuring that patients are delivered to the right care settings after they call for help. Paramedics and Emergency Medical Technicians can add value to the health care continuum through appropriate patient referrals and dispositions. Currently, most prehospital patients are brought to an ED after a call for help. If we are to measure value by considering disutility of care, then this paradigm needs to be examined. A trip to the ED adds little value to a patient with an upper respiratory infection, a fall with no injury in the elderly, or a psychiatric complaint. The ED may provide limited benefit to patients with these conditions, but the wait times and cost inherent in such a trip make it a poor choice for care of this type, and one of dubious value. These patients might best be evaluated at a community clinic, at an urgent care facility, or with an in-home visit and evaluation by a gerontologist and social worker. Emergency Medical Services add value to the continuum by bringing the right patient to the right resource. The ambulance ride and ED visit simply serve as a non-value added component of a wasteful process that sits between the initial call to EMS by a concerned senior and the ultimate disposition at a geriatric specialist.

Structural and reimbursement impediments currently prevent this simpler system of early triage and disposition. It is not clear that today's EMS worker is able to make good triage decisions. Several trials of alternative method/destination programs have attempted to determine whether EMS workers can appropriately assess, triage and disposition the low-acuity patients that form the bulk of their workload, with conflicting results.<sup>13-16</sup> The recent attention paid to the concept of community paramedicine is a welcome move in the right direction. Community paramedics are

being trained to provide evermore sophisticated diagnoses and treatments, which allow for more timely and resource-appropriate care. For example, one evaluation of a United Kingdom-based community paramedic program revealed that paramedics with extended skills could reduce transfers to the ED, while improving patient satisfaction in certain cohorts.<sup>17</sup>

Finally, value remains a function of both cost and outcomes. To date there has been little focus on the cost of many EMS interventions because the full expense of EMS care, unlike hospital medicine, is infrequently transferred to vigilant payers. Instead, costs in EMS tend to be spread among payers, municipalities and volunteer agencies. A value equation cannot be generated until costs, as well as outcomes, are known and challenged. Current funding models, which may involve a mix of fee-for-service insurance reimbursement, subsidies and donations, obfuscate the true costs of care.

### The Path Forward

Current health care reform efforts in the United States offer EMS leaders the opportunity to redefine the ultimate goals of the EMS system. Current models of evaluation, cost analysis, system design and integration are currently being reconsidered across the health care spectrum. It seems likely that new models of care will emerge and be embraced because they offer value to patients. Examples of this trend abound. Outpatient surgical centers now perform surgical cases once reserved for inpatient settings. Innovative hospital-at-home programs send nurses and physicians to treat moderately ill patients at home.<sup>18</sup> In both these cases, evaluation of outcomes and a regimented understanding of costs drove new models of care. Payers and patients alike have embraced innovation and disruption to existing models of care because these new systems offer superior value.

As we move forward, it would behoove EMS leaders to consider these trends carefully. There is no doubt that health reform efforts will eventually fundamentally re-engineer the current EMS system. Closer integration into the rest of the "house of medicine" seems likely, with interesting hybrid EMS/non-emergency care models a distinct possibility. New models of EMS care will require changes to regulations, licensing, reimbursement, and medical protocols. As these models evolve, an organized approach to assessing the range of important outcomes—and careful assessments of cost—need to be leading considerations. For EMS leaders, value generation can serve as a touchstone for evaluating competing visions of the future.

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