Strategy for a National EMS Culture of Safety

10/03/2013

This project was produced under a cooperative agreement between the National Highway Traffic Safety Administration (NHTSA), with support from the Health Resources and Services Administration's (HRSA) EMS for Children (EMSC) Program, and the American College of Emergency Physicians (ACEP).

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I. Summary

Emergency medical services (EMS) is a critical component of the nation's healthcare system. In the U.S., EMS personnel respond to an estimated 37 million calls per year.[1] EMS is also an integral component of the nation's disaster response system.[2]

In recent years, cultural and operational safety advances have been broadly implemented in many healthcare settings, as well as aviation and other high-consequence fields. Yet, too often, the very emergency medical system that people count on for help unintentionally risks or even causes preventable harm to three related groups: EMS personnel, patients and members of the community.

Risk of Harm to EMS Personnel: Regardless of their location or the type of system in which they work, EMS personnel are expected (and often expect themselves) to do their work under difficult, unpredictable and rapidly changing circumstances. They may work long hours, in harsh environments, with limited information, assistance, supervision and resources to accomplish their mission. In the course of their work, they may be exposed to risks such as infectious organisms, emotional stress, fatigue, physical violence, occupational injury, vehicle crashes, and personal liability. They are more than 2-1/2 times likelier than the average worker to be killed on the job,[3] and their transportation-related injury rate is five times higher than average.[4]

Risk of Harm to Patients: In 1999, the Institute of Medicine report *To Err Is Human* called the attention of the public and the medical community to the topic of preventable adverse medical events. Since then, the nation's healthcare system has moved toward a culture of safety in many inpatient and outpatient settings. But these concepts and practices have yet to be widely embraced in the EMS community.

Risk of Harm to Members of the Community: EMS risks causing harm to the public. An example of this is the interaction between an ambulance responding to an emergency event and the general motoring public.

An Urgent Problem of Unknown Scope

It is difficult to measure the extent of harm caused to each of these three groups, and thus to create tailored solutions and measure their effect. Because reporting requirements and mechanisms are incomplete at best, reliable data are sparse and capacity for research is limited. Concerns over privacy laws, tort liability, trade secrets and potential public embarrassment hamper sharing of information that could be used to understand risks and identify system-level opportunities for improvement. A lack of standardization complicates efforts to aggregate and assess even available data. Because of these and related factors, EMS is severely limited in its ability to support policy initiatives, funding requests, quality improvement or even many day-to-day operational decisions on scientifically defensible, data-driven information.

A further complication involves the general approach to risk in EMS. An adverse event in EMS is defined as "a harmful *or potentially harmful* event during the continuum of EMS care that potentially preventable and thus independent of the progression of the patient's condition"[5]

(emphasis added). But EMS has more typically targeted the event that causes harm than circumstances that increase risk of harm. Many of the metrics related to safety in EMS are, accordingly, related to actual events rather than risk. More robust data that supports sophisticated analysis is needed to take a step back from the harmful event itself and focus on the risky environment that promoted it.

Given the limitations in data, it is challenging to make an evidence-based, scientifically defensible argument supporting the need for improvements in EMS safety. Regardless of these factors, however, it is the consensus of the EMS community—expressed through the more than 20 stakeholder groups contributing to this project, and by the general EMS community via open meetings and a public comment process—that it would be unacceptable and irresponsible to withhold action until some unknown future point when an ironclad case can be made for improving safety in EMS.

EMS safety is a problem that demands to be solved. This Strategy is intended to shift the status quo and chart a new course that will support a culture of safety in EMS. The almost 1 million EMS professionals in the U.S.—and the hundreds of millions of citizens who expect and deserve functional, efficient, professional emergency medical services to be there for every emergency and every disaster—are all depending on efforts to create a safer EMS system.

Strategy Background

This Strategy stems from a 2009 recommendation by the National Emergency Medical Services Advisory Council (NEMSAC) for the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) to create a strategy for building a culture of safety in EMS. NEMSAC is a Federal advisory committee of EMS representatives and consumers that provides advice and recommendations to the Secretary of Transportation and to the Federal Interagency Committee on Emergency Medical Services (FICEMS) on matters relating to EMS.

Process: The Strategy was developed in a three-year, iterative process to allow for collaboration and input from a broad group of stakeholders both inside and outside the EMS community. The Strategy has been guided by a Steering Committee of experts representing a broad variety of EMS constituencies. The process also included public review and comment.

Scope and Intended Audience: The Strategy is a vision-oriented effort on a national scale. It does not attempt to serve as a substitute for the work of qualified researchers, scientists and technical experts. Rather, it is an effort to further that work by supporting, enhancing or creating channels for its advancement, standardization, practical application and widespread adoption.

The Strategy was commissioned as a high-level document. It is intended to guide decision-makers on the priorities, concerns and commitment of EMS stakeholders. The Strategy is not intended as a practical safety manual, nor is it designed for everyday use by EMS provider agencies. As such, it does not address highly detailed factors or make specific recommendations about operations, vehicles, equipment, medical procedures, etc.

This document is intended primarily for EMS leaders and organizations that are in a position to directly or indirectly support development of a culture of safety. The document is written broadly to include stakeholders both inside and outside EMS. While several EMS stakeholder organizations have created specific definitions of what EMS encompasses, the Steering Committee recognizes that emergency medical services is in a time of rapid evolution and that the existing definitions may well not capture what EMS evolves into over the next 10 to 15 years. Regardless of what needs EMS fills within the healthcare continuum and the community, safety must be a core value and be integrated into every aspect of EMS in the future.

The Strategy is intended to be well connected to science, best practices and trends both within and outside EMS, across healthcare and business. This intent is limited by the previously detailed realities limiting scientific support. Indeed, a significant benefit to the promulgation of the Strategy itself is the potential to spur research, data systems and reporting that are currently lacking. Accordingly, the Strategy incorporates a combination of proven concepts and promising ideas.

The Strategy's Six Core Elements

This Strategy consists of six essential elements for advancing a culture of safety in EMS. These elements are described in greater depth beginning on page 34 of this document.

Just Culture: The Strategy envisions a Culture of Safety within EMS that embodies values similar to those of a school of thought known as Just Culture. Widely adopted throughout healthcare, aviation and a growing number of other fields, Just Culture is an *open-source, non-proprietary approach that embodies fairness and promotes accountability*. It describes an organizational environment that encourages individuals to report mistakes, allowing a structured assessment that includes the risks that led to the error. By focusing on risk rather than negative outcomes, by addressing system factors, and by holding both systems and individuals accountable, factors that have or could lead to future errors can be modified in a collaborative way, without blaming or punishing.

Just Culture is not a substitute for a comprehensive safety management system. Its inclusion as a key element in this Strategy is intended as an important, appealing and achievable first step toward broader cultural change.

More information about the role of Just Culture in an EMS culture of safety appears beginning on page 37 of this document.

Coordinated Support and Resources: Broadly advancing EMS safety in the most consistent and expedient way requires support, coordination, monitoring of progress, and sharing of centralized information and related resources to the EMS community. This Strategy envisions a centralized function to provide this guidance, encompassing representation from a broad spectrum of stakeholder groups. This function would be advisory and guiding, rather than one of oversight, regulation or enforcement authority.

More information about the role of coordinated support and resources in an EMS culture of safety appears beginning on page 40 of this document.

EMS Safety Data System: There is an urgent need to better understand the scope, frequency and nature of EMS responder injuries, adverse medical events and adverse events involving the community. Currently, data that could help build an understanding of these issues may be housed in many different places, and is not reported uniformly.

Improved data accessibility can enable meaningful use of that data to better understand issues, support recommendations and provide appropriate conclusions. As a first key step toward data-driven policy and decision-making, an EMS Safety Data System is envisioned, not as a new database, but as a national, robust, well-designed, secure data system linking and communicating with existing data systems to encompass key information about EMS safety. This Safety Data System would be made available for researchers and policy-makers, as well as use by national stakeholder organizations and individual EMS provider agencies.

More information about the role of an EMS safety data system in an EMS culture of safety appears beginning on page 44 of this document.

EMS Education Initiatives: EMS education (both initial programs and continuing education) represents a crucial opportunity for delivering both responder safety and patient safety information, changing attitudes, and creating a national culture of safety in EMS. The Strategy envisions delivering education to both leaders and practitioners at all levels.

The Strategy includes a significant evolution of the EMS education process, in which the values and practical elements of a culture of safety are *fully integrated into each component of EMS education.* Under this model, awareness of the safety of responders, patients and the public would become a pervasive consideration.

More information about the role of EMS education in an EMS culture of safety appears beginning on page 48 of this document.

EMS Safety Standards: The promotion of standards in EMS can enhance safety for EMS responders, patients and members of the public whom EMS encounters in the course of its work. High priority should be given to standards that support safety not only from an operational or technical viewpoint, but from a cultural perspective as well. Standards should be selected or developed following an evidence-based approach whenever possible—that is, one based on literature/evidence, data and consensus.

More information about the role of EMS safety standards in an EMS culture of safety appears beginning on page 51 of this document.

Requirements for Reporting and Investigation: To successfully implement a culture of safety in EMS that improves safety for responders, patients and members of the public, mandates to report standardized data by all EMS provider agencies are needed to support the creation and population of the national EMS safety data system.

Steps for developing reporting and investigation requirements may include determining what data types are necessary and useful; describing what data is already be available or mandated; learning from those with hands-on experience; exploring options for an authorized investigative body; and identifying best practices.

More information about the role of reporting and investigation requirements in an EMS culture of safety appears beginning on page 53 of this document.

II. Vision

EMS community leaders envision an EMS Culture of Safety as one in which safety considerations and risk awareness permeate the full spectrum of activities of EMS everywhere, every day—by design, attitude and habit. This Strategy document is intended to change the status quo by creating, encouraging, and supporting a cultural shift that improves the linked domains of responder, patient, and community safety.

III. Goals

EMS exists to make a difference in people's lives, often at their time of greatest need. This Strategy represents a unique opportunity to positively impact the lives of EMS personnel, their patients and the general public by creating and promoting a culture of safety.

Safety culture refers to a collection of core values that provide a frame of reference for leadership and workers, and influence shared beliefs, practices, rituals, norms and behaviors related to safety. A positive safety culture is expected to result in decreased risk, fewer errors, adverse events and other negative safety outcomes.

At a high level, the goal is an EMS culture in which safety considerations permeate the full spectrum of activities of EMS leaders and practitioners everywhere, every day—by design, attitude and habit.

This Strategy is intended to create, encourage and support a cultural movement, structures, resources, reporting mechanisms and related supporting elements that advance improved responder safety, improved patient safety, and improved safety of the community, each closely linked to the others.

Implementation of the Strategy elements is expected to lead to:

An environment of empowerment. In a culture of safety, all team members are able to speak up about unsafe practices, in real time, as well as to propose ways to operate more safely with appropriate accountability. In such an environment, every manager and every member of the team, regardless of level of training or tenure, is expected to act in the interest of responder safety, patient safety and safety of the community.

An environment of knowledge. Both informed leadership and an informed workforce are essential components of a culture of safety. This includes educational initiatives for leaders and practitioners as well as systematic efforts to gather and analyze data on responder safety and patient safety.

An environment of openness and inclusiveness at every level. In high-consequence industries, punishing people for mistakes merely encourages them to hide unsafe behaviors and adverse outcomes. Openness to admitting errors and examining the processes and risks that led to them is a key part of the vision for a culture of safety. The vision also encompasses an environment of inclusiveness at every level, with national resources and leadership to support state, regional, local and organizational efforts.

An environment of improvement. Value can be created via enhanced data and quality measurement systems related to efforts to improve safety. This is an especially important consideration in anticipation of a direct connection between quality metrics in EMS and reimbursement. Improvements in safety can lead to reductions in responder deaths, injuries and shortened careers, reductions in adverse medical events, as well as reductions in property damage, injuries and deaths among members of the community whom EMS encounters (i.e., crashes involving EMS vehicles).

A culture of safety is not an end unto itself, but an ongoing effort to improve. While substantial cultural change takes considerable time, and because EMS is a dynamically evolving profession, the Strategy is intended to be flexible and applicable to EMS as it continues to mature as a partner in the healthcare system.

IV. Guiding Principles Used in Developing the Strategy

The following principles were drafted collaboratively by the Steering Committee. They represent fundamentals that are intended to permeate the development process and tie the work to the EMS community. These concepts are critical to the successful development and implementation of the Strategy. In some cases, they are acknowledgements of limitations or realities that materially affect the chances for acceptance and successful implementation of the Strategy in the EMS community. In every instance, they guide decision-making and priority-setting.

1. **The Strategy must consider the parallel goals of responder safety, patient safety and safety of the community.** Although initiatives and desired outcomes described in the Strategy necessarily apply to patient safety, provider safety and safety of the public in unequal proportions, the Strategy itself is an effort to advance all three of these goals.

2. **The Strategy should capitalize on the common priority—concern for the patient.** Despite their varied nature, EMS systems, leaders and field personnel share a common concern for the well-being of patients. Wherever possible, the Strategy should tap into this universal motivation.

3. **The Strategy must allow that creating a culture of safety in EMS will take years to accomplish.** While the Strategy seeks opportunities to gain benefits quickly wherever possible, it also acknowledges the accepted view among experts that true cultural change often takes a full generation, up to 20 years. Accordingly, the Strategy focuses not only on today's EMS managers and practitioners, but those who will be leading the field and delivering patient care up to two decades from now.

4. **The Strategy must consider the disparate nature of EMS.** EMS is a discipline with dramatic structural and cultural variation, as well as multiple delivery models and levels. To be successful, the Strategy must recognize that some concepts may work better in certain segments of the EMS community than others. Wherever possible, the Strategy must avoid blanket assumptions and "one-size-fits-all" solutions.

5. **The Strategy must respect the unique set of circumstances and environments in which EMS functions.** EMS operates at the intersection of public health, public safety and medicine; it is simultaneously part of, and yet not completely within, all three spheres, each with its own set of structural and cultural influences, restrictions and opportunities. The sphere in which EMS operates is complex and frequently changing, and its mission is complicated by emotionally charged situations and public expectations that are not always reasonable or realistic.

6. **The Strategy must acknowledge that EMS typically has limited resources.** Although the future is not known, many EMS leaders at both the local and national level anticipate increasing difficulty in meeting increasing demand for services with budgets that in many cases are diminishing. And because leaders typically are preoccupied with maintaining critical services on a day-to-day basis, gaining broad

support for safety initiatives may require sustained effort and/or new funding.

7. **The Strategy should incorporate lessons learned from other fields.** EMS is often assumed to be an inherently risky profession, an assumption that likely complicates the creation of a culture of safety. However, other disciplines that carry considerable inherent risks (e.g., aviation, surgery, anesthesiology) have achieved noteworthy safety records through systematic efforts. The Strategy should identify cultural and practical factors that have been shown to improve safety in these disciplines.

8. **The Strategy should be evidence-based within reason.** There is a growing movement supporting evidence-based decision-making at all levels in EMS, and the Strategy should be based on data and evidence wherever possible. However, the Strategy must also acknowledge the current limitations in available EMS data, particularly related to responder safety, patient safety and community safety. Accordingly, the Strategy should consider concepts that are reasonably believed to carry potential benefits, even when there is limited scientific evidence or data. Wherever possible, the Strategy should call for data-gathering according to accepted standards.

9. **The Strategy should seek a balance between cultural and practical considerations.** The culture of EMS itself tends to be practical, objective, action-oriented and "hands-on," rather than theoretical, conceptual, academic or abstract. Indeed, the very concept of a "culture of safety" may be received with skepticism, as may the idea that the cultural aspects of safety are as important as utilitarian items like checklists in improving safety outcomes. Elements that come from this project must bridge these inherently contrasting factors. Care should be taken to avoid the temptation to focus on practical considerations to the exclusion of strategic focus.

10. **The Strategy should seek opportunities to build on existing foundations.** To be successful, the Strategy should avoid redundancies to the greatest degree possible. It should consider the findings and recommendations of past white papers that address issues of culture and safety, and it should seek to connect, not re-create, entities, resources and mechanisms that already exist.

11. **The Strategy should strive to be emulated by others.** EMS is a high-profile, critical service that fundamentally affects the lives of millions of American families. The Strategy presents an opportunity to further the EMS mission by serving as a template for other professions and industries to follow in building their own culture of safety.

Part 2
Safety of EMS Personnel, Patients & the Community

I. EMS Personnel Safety

An emergency responder who is injured or killed is unable to assist someone who needs help, and a responder injury diverts resources (e.g., personnel, vehicles, medical facilities) that would otherwise be available to assist the public. With this in mind, and in recognition of the fact that emergency responders deserve a system that values their safety, it is acknowledged that protecting EMS personnel is paramount.

Nevertheless, the job is a dangerous one for EMS personnel. The occupational fatality rate among EMS workers is 12.7 per 100,000 workers per year, more than twice the national average for all occupations and comparable to rates for police and firefighters.[6] The rate of non-fatal injuries among EMTs and paramedics was found to be 34.6 per 100 full-time workers per year, a rate more than five times higher than the national average for all workers.[7] Research has also shown that female EMS workers have a disproportionately high risk of injury[8] and that there are significant dangers associated with disaster responses.[9]

Work-related stress and fatigue are familiar themes to anyone working in the EMS field. Exposure to both chronic and critical incident stressors increases the risk of EMS personnel developing a posttraumatic stress reaction.[10] A study of associations between sleep quality, fatigue and safety outcomes in EMS identified 1.9 greater odds of injury, 2.2 greater odds of medical errors or adverse events, and 3.6 greater odds of safety-compromising behavior among fatigued respondents versus nonfatigued respondents.[11]

EMS personnel also risk exposure to violence and/or becoming the subject of violent assault on the job.[12] In one study in a large California EMS system, EMS personnel encountered some sort of violence in 8.5 percent of patient encounters, and were subjected to violence directed at them in 4.5 percent of patient encounters.[13] Of encounters where violence was directed at EMS personnel, 21 percent involved nonphysical (verbal) violence only, while 79 percent involved physical violence.

Transportation incidents present a significant risk for EMS personnel.[14] [15] [16] [17]Researchers have reported that: ambulance crashes result in twice as many injuries per crash as the national average;[18] 20 percent of transportation related injury cases result in 31 or more lost work days;[19] and 86 percent of all occupational fatalities among U.S. EMTs and paramedics are secondary to transportation events.[20]

This phenomenon is not only seen in the U.S., where the transportation related fatality rate for EMS workers is approximately five times higher than the national average;[21] it is also seen in Australia, where the transportation-related fatality rate for paramedics is three times higher than the rate for U.S. EMS workers.[22]

The good news related to transportation incidents comes from one of the first studies to document the results of an intervention to improve EMS safety. That study showed a 50 percent reduction in the ambulance collision rate following a multifactorial intervention.[23]

The occupational injury problem also has significant implications for EMS managers. For example, in the U.S., the employers' healthcare cost for EMT and paramedic occupational injuries is approximately $60,000 per 100 full time workers per year (these costs do not include the cost for replacement workers, early termination, etc.);[24] and 100 percent of litigation claims against one EMS agency came from transportation-related incidents.[25] Although the physical demands of emergency response are a leading cause of injuries, it is difficult to assess risk without better data, particularly for volunteers.[26]

There are also significant implications for EMS patients and communities. In one study of fatal ambulance crashes, eight of the 25 victims were identified as EMS personnel; 17 of the fatalities were patients, family members and community members.[27]

II. Patient Safety

A key goal of creating and implementing a culture of safety in EMS is to create improvements in patient safety. The Strategy defines patient safety in EMS as *preventing medical errors (such as administering an incorrect medication) and other adverse events (such as dropping a patient) and decreasing the chance of harm to patients should such events occur.*

According to the Institute for Healthcare Improvement (IHI), approximately 80 percent of medical errors in the hospital environment are system-derived.[28] And the prominent Institute of Medicine report *To Err Is Human: Building a Safer Healthcare System* notes:

> "The majority of medical errors do not result from individual recklessness or the actions of a particular group—this is not a 'bad apple' problem. More commonly, errors are caused by faulty systems, processes, and conditions that lead people to make mistakes or fail to prevent them."[29]

It is not reasonable to expect that even well-educated and qualified people with the best intentions can completely overcome the complexities of caring for patients in the dynamic, unpredictable context of prehospital care. The Strategy seeks to follow the IHI philosophy that when human beings are involved, mistakes will occur, and it is the responsibility of EMS leaders to design a system so that harm does not occur or is minimized.

Patient safety in the EMS setting has been poorly studied, with little data and limited trials of interventions designed to make EMS safer. A report from the Canadian Patient Safety Institute, *Patient Safety in Emergency Medical Services: Advancing and Aligning the Culture of Patient Safety in EMS,* identified the following themes in a systematic review of the literature relating to patient safety in EMS:[30]

- Clinical judgment
- Adverse events
- Ground vehicle safety
- Field intubation
- Air operations safety
- Interfacility transfer

The researchers reported that experts believe flawed decision-making by EMS personnel is overlooked too often when considering safety; the report further offered the opinion that the "most important risk" to safety is poor clinical judgment, with the "greatest safety feature of EMS systems" being good clinical judgment.

A 2004 study reported that 45 percent of EMTs identified at least one error in the year prior to the survey, and further demonstrated the willingness of EMS personnel to identify and report errors.[31] Additional studies have explored adverse events in EMS in the context of endotracheal tube placement, diagnostic accuracy, mathematical calculations, medication administration, and tort claims.[32, 33, 34, 35, 36, 37, 38, 39]

Children are at increased risk of adverse events in the prehospital setting,[40] and the consensus is that a safe environment with a high quality of care will reduce morbidity and mortality amont pediatric patients. Medication dosing errors in pediatric patients in the EMS setting have been poorly studied, at least in part because paramedics have infrequent encounters with pediatric patients. One Michigan State University study found that medications delivered in the prehospital care of children were frequently administered outside of the proper dose range when compared with patient weights recorded in the prehospital medical record, with a medication dosing error occurring in nearly 35 percent of drug administrations—nearly twice the rate at which medication dosing errors occur in hospitalized children.[41]

Although there has been far less research into patient safety and adverse events in EMS compared to other healthcare settings, the indications from various inpatient and outpatient epidemiology studies lead to a reasonable assumption that there is unrecognized and preventable harm in EMS.[42] Although more study is needed to quantify the dollars involved, it follows that there are corresponding costs to patients, EMS and the healthcare system, and society as a whole—and considerable savings to be realized from improved patient safety in EMS.

III. Safety of the Community

Harm to members of the public (i.e., non patients) resulting from EMS operations is even less studied than EMS responder safety or EMS patient safety. Scant, inconsistent or nonexistent reporting requirements make research difficult or impossible on a national level, but it is generally believed in the EMS community that the greatest risk to the public involves EMS vehicle operations (regardless of whether an EMS vehicle is actually involved in a crash or the crash occurs because of other drivers' sudden reactions to the presence of an emergency vehicle).

More research is needed before comprehensive efforts can be developed to reduce harm caused to the public by EMS operations. Meanwhile, it is reasonable to anticipate that systemic initiatives aimed at improving responder safety and patient safety will also result in improvements to the safety of the community.

Part 3
Cultural Considerations

I. Defining Culture

Because the Strategy seeks to influence EMS culture, it is helpful to define what culture is.

Former airline pilot and risk-management consultant Scott Griffith, who has worked extensively with organizations in high-risk disciplines, offers a definition of culture that is particularly applicable to the goals of the Strategy:

> **culture:** "*The way we do things around here.*"

This definition was selected for its simplicity and because it reveals the essence of what the Strategy seeks to tap into: the substantial power of culture to influence behavior, and, conversely, the potential for it to be shaped by the collective behaviors of the individuals in an organization.

Section 4-III of this document explores contemporary EMS culture and the role of responder safety and patient safety in EMS culture—in other words, "the way we do things around here now." (See page 26.)

II. Defining Culture of Safety

The Strategy subscribes to the following definition of a culture of safety, put forth by University of Illinois at Urbana-Champaign researchers Douglas A. Wiegmann, Hui Zhang, Terry von Thaden, Gungan Sharma and Alyssa Mitchell in a paper synthesizing safety culture research:[43]

> **Safety culture:** *"The enduring value and priority placed on worker and public safety by everyone in every group at every level of an organization. It refers to the extent to which individuals and groups will commit to personal responsibility for safety; act to preserve, enhance and communicate safety concerns; strive to actively learn, adapt and modify (both individual and organizational) behavior based on lessons learned from mistakes; and be rewarded in a manner consistent with these values."* [1]

Although it is the desire of this Strategy that safety become a permeating priority in EMS culture, it should also be acknowledged that organizational culture is complex, with many factors that are unrelated to safety.

The concept of a culture of safety is often attributed to analysis of the disaster at the Chernobyl Nuclear Power Plant in Ukraine in 1986—more specifically, reports commonly refer to the accident as resulting from a *lack* of a safety culture.

The concept of a culture of safety has also been applied extensively to such fields as aviation and healthcare (most often in the hospital setting). Much of the literature related to safety culture focuses on these disciplines.

It is possible to measure the culture of safety in an EMS organization, and although limited research is available, preliminary associations between safety culture, safety-related behaviors and safety outcomes have been observed. A 2008 report in Academic Emergency Medicine described EMS personnel's perception of the nature of adverse events and near-misses in out-of-hospital care.[44] The EMS Safety Attitudes Questionnaire (EMS-SAQ) measures workplace safety culture, and the EMS Safety Inventory (EMS-SI) captures self-reported safety outcomes from EMS workers. Collectively, these tools have been introduced to the EMS profession by Daniel Patterson, Ph.D., and colleagues, to benchmark safety attitudes within an organization.[45] The tools are used in the University of Pittsburgh Department of Emergency Medicine's EMSARN EMS Safety Culture Project (http://emergencymedicine.pitt.edu/research/emsarn/ems-safety-culture), an ongoing project that seeks to examine trends in EMS safety culture over time.

In a report published in *Prehospital Emergency Care* in 2010, the researchers noted a wide variation across EMS agencies in safety culture scores, with lower safety culture scores associated with increased annual agency patient contacts. The report did not cite the possibility of increased patient contact building reliance on shortcuts and at-risk behaviors that may be reinforced by few negative outcomes, or outcomes that were not clearly tied to

[1] Note: The researchers for the above-referenced report noted that while the term *safety climate* is sometimes used interchangeably with *safety culture* in published works, the former is more commonly used to refer to the perceived state of safety at a particular place at a particular time. The Strategy does not use *safety climate* as a synonym for *safety culture*.

behaviors. Their 2012 report in the same journal noted that individual EMS worker perceptions of workplace safety *culture* were associated with measures of patient and provider safety *outcomes*.[46] In that study, researchers included six domains of safety culture: safety climate, teamwork climate, perceptions of management, working conditions, stress recognition, and job satisfaction. Respondents who reported experiencing worker injury scored lower on five of the six domains than respondents who did not experience an injury. Respondents reporting an error or adverse event scored lower for four of the six domains, while respondents reporting safety-compromising behavior had lower safety culture scores for five of the six domains. The researchers described their findings as preliminary evidence of the association between safety culture and patient or provider safety outcomes.

In another study assessing the association between perceived safety culture and compliance with safety procedures in a busy urban EMS system, EMS workers with a high degree of perceived safety culture had twice the self-reported strict adherence to safe work practices as those without.[47] Frequent safety-related feedback and training was strongly associated with adherence to safe workplace behaviors.

The Strategy recognizes the importance of consistent definitions in supporting efforts to advance a culture of safety, particularly when it comes to measuring progress. There would be considerable benefit from efforts by qualified researchers to synthesize literature on nomenclature related to safety culture in EMS, or to publish recommended definitions.

III. Safety in the EMS Culture

EMS culture, or "the way we do things around here," exerts a powerful influence on the attitudes, expectations and behaviors of both organizations and individuals, particularly when it comes to responder safety, patient safety and the safety of the community. It is described in this document because it represents the "stage" on which the Strategy is anticipated to play out.

There is limited published information on *EMS safety culture* specifically, but a number of common themes in EMS culture may be relevant to safety, particularly in light of safety advances achieved in the cultures of other processions. It is typically believed by Strategy project stakeholders that *EMS culture* often:[48]

- Creates an expectation of high performance under difficult circumstances
- Expects individuals to be extremely vigilant 100 percent of the time
- Fails to properly motivate individuals to speak up about unsafe systems or practices
- Tends to punish mistakes, especially depending on the severity of the outcome
- Accepts, overlooks, or encourages individuals to work around system-related problems (until harm results, in which case the individuals are subjected to punishment)

EMS culture in general is influenced by a variety of factors, many of which in turn influence safety culture. The following influencers were noted by the Steering Committee, and are generally believed to be relevant to a culture of safety in EMS:

Structural & Cultural Factors

Variation in Delivery Models. As noted earlier in this document, EMS is a discipline with dramatic structural and cultural variation, multiple delivery models and levels. EMS is provided by fire departments; stand-alone EMS agencies, whether municipal, private or not-for-profit; hospitals; volunteer agencies; state, federal, and tribal organizations; interfacility transport agencies; air-medical services; military; law enforcement; and industrial agencies, among others, each with their own rules, regulations, cultures and resources.

EMS also overlaps with public health, public safety and medicine. While these three disciplines have a lot to do with what EMS does, EMS represents only a small segment of each of these disciplines' missions. Accordingly, although EMS does have a culture of its own, it is also susceptible to the influences of the cultures with which it overlaps.

Volunteerism. Another variable is volunteerism in EMS, and its unique (and changing) role in many rural and suburban communities, especially in terms of recruiting, staffing, training, accountability and oversight.

Operational & System Factors

Resource Limitations. EMS is almost always felt to have limited resources—financial resources, human resources and other resources. Many EMS leaders at both the local and national levels have expressed concerns about the ability of EMS organizations to balance shrinking resources with increasing demand for services. In addition, EMS leaders both individually and through national organizations have voiced serious concerns about the current reimbursement model, which only partially funds most EMS operations. At the organizational level, resource limitations act as a distraction from safety concerns for leaders, and also set up a sometimes-unvoiced but powerful organizational expectation that safety is conditioned on availability of resources.

Pervasive underfunding also results in a pay structure in many systems that is well below most other healthcare providers, leading many EMS professionals to quit early in their careers, or to work two or three jobs for as long as they can and then quit or transition to other healthcare jobs. This also leads to overtired, overworked EMS personnel who are more likely to make errors or engage in at-risk behaviors. EMS pay structure in the U.S. contrasts with Australia, for example, where paramedics are well paid and the majority remain in the profession through retirement. The cost to society—and the taxpayer—is significant and includes the loss of experienced clinicians.[49]

Lack of a Systems Approach. EMS organizations typically follow an event-based approach to safety concerns—yet it is a systems-oriented approach that has made an impact on safety in other fields. This concern encompasses both general lack of uniform EMS systems, even at the state level, and a lack of consistency in the concept of safety itself.

Operational Performance Pressures. Strategy stakeholders also observed that EMS personnel are often under considerable pressure to maintain high operational performance (commonly defined as productivity and compliance with contractual or policy-driven requirements for response times) despite limited resources, and that operational performance is sometimes communicated as the top organizational priority, intentionally or not. Under such circumstances, safety goals may be seen as impeding such performance, and they are subjugated. (See “Focus on Response Times,” below.)

Focus on Response Times. One of the few metrics that is routinely measured in EMS organizations is response times, despite scant evidence that response time makes a clinical difference. EMS provider organizations are often contractually held to a specific response-time performance standard, sometimes with fines levied for noncompliance. This both reinforces the perceived need to rush and creates organizational incentives to do so. The resulting sense of pervasive urgency in turn feeds the belief in the EMS culture that taking chances is part of “trying our hardest.”

Focusing on response times may also distract from focusing on quality clinical care or safety.

Gaps in Leadership Development. There are a number of methods that have proven effective in other healthcare and business disciplines for assessing, selecting and developing leaders. These best practices are not entirely absent from EMS, but the EMS community has not broadly or systematically adopted them. This is evident in the paper *Emergency Medical Services Management and Leadership Development in America: An Agenda for the Future*, which notes challenges and gaps in leadership education. A leadership competency program currently under development by the National EMS Management Association (NEMSMA) attempts to standardize leadership education and requirements. EMS leaders also would benefit from more robust, centralized resources for safety practices to implement in their organizations, both clinically and operationally.

Reinforcement of Unsafe Behaviors. Too often in EMS, unsafe outcomes result in blaming and punishing the individual while overlooking system or process shortcomings, despite an environment in which risk-taking is considered part of the job as long as nothing bad happens. This is a real-world, textbook example of David Marx's observation that unsafe behaviors are reinforced when they are "rewarded"—i.e., nothing bad happens and the at-risk behavior is not addressed. In a strategy document that could have been written specifically for EMS, the National Fallen Firefighters Foundation describes a "cycle of unsafe behavior reinforcing itself [and is] driven underground by departments who ignore the messages of near-misses.... [leads to] a continual cycle of negative, unsafe behaviors that result in avoidable tragedies. They occur because the organizational culture permits and perpetuates them."[50]

Possible Disconnect Between Clinicians and Leadership. In a study of safety culture in 15 California hospitals that has implications for EMS organizations, researchers found "definite discrepancy" in perceptions about safety between non-clinician senior managers and front-line clinical workers, with clinicians giving more problematic responses. "This could make it hard for non-clinician executives to understand the true state of their organization, to determine changes needed, and to assess their attempts to create and maintain a culture of safety," the researchers wrote. "Long-term progress may need to include interventions specifically aimed at improving safety culture and breaking down barriers between managers and front line workers," they concluded.[51] Whether they personally have clinical experience or not, the best EMS leaders understand the critical importance of emphasizing both quality of care/clinical outcomes and operational imperatives; such an approach is essential to a culture of safety at the organizational level.

Long Shifts. Many EMS systems maintain a 24-hour (or longer shift) schedule. The link between fatigue and poor safety outcomes is well documented throughout the literature. When EMS personnel do not get sufficient uninterrupted sleep, fatigue may cause increased risk to responder safety, patient safety and the safety of the community.

Adapted Practices and Equipment. EMS culture is built on a history of adapting practices, vehicles and equipment originally developed for other settings (ER, ICU, OR, mortuary) for use in a prehospital care setting. In recent years, a growing list of equipment and protocols have emerged designed exclusively for field use, but the industry historically has not demanded its own set of tools. In many cases, the market has not been large enough for manufacturers to create EMS-specific products. The general acceptance of resource limitations within the EMS profession may lead to a corresponding acceptance of the status quo. In such an environment, adapting existing practices *itself* becomes a "best practice."

Disasters. Stakeholders further noted that safety goals are sometimes compromised when local EMS organizations respond to disasters or large-scale incidents outside the scope of normal operations.

Attitude/Individual Factors

Misplaced Beliefs. Stakeholders also observed that responder safety and patient safety suffer from the widespread cultural belief in "going all out" for patients, which can lead to poor safety choices and unsafe actions (such as driving unsafely, rushing procedures, taking shortcuts, failing to use personal protective equipment, etc.). A related factor is the misplaced belief that "doing things" equals "helping"—that is, a genuine desire to help the patient may lead to unnecessarily aggressive treatment that carries risks that outweigh the potential benefit to the patient. For a culture that is so action-oriented, it is difficult to accept the idea that intervention does not always lead to better outcomes, and can even cause harm—and that sometimes doing nothing is the best treatment.

This factor is complicated by variability in practice among (and sometimes within) EMS systems. Misperceptions may be further reinforced by gaps or delays in translating current science to the field, a phenomenon in which even accepted evidence takes a long time to be reflected in alterations to protocols, particularly when information is not readily available for leaders to make appropriate system/practice changes. There is also a need for field practitioners to have education, information and the clinical judgment to understand the "why" of evidence-based changes—not merely technical proficiency in proscribed skills.[52] A "why" mindset may enable field practitioners to support changes and stop doing things that aren't safe or that no longer represent acceptable practice.

Stakeholders further noted that both responder-safety and patient-safety protocols are often treated as optional when they are viewed as hindering care, comfort or convenience.

Public Misperceptions About the Nature of EMS Work. Depictions of EMS in popular culture, particularly in television, movies and the media, often reinforce the urgent, life-and-death nature of the work, and contribute to the impression that risk-taking is part of the job. The public may also harbor unrealistic expectations about

"heroes who risk it all when lives are on the line." Such misperceptions have the potential to attract certain candidates who are inappropriately drawn to the perceived adventures that accompany a career involving lights and sirens and life-and-death situations. The concept of tombstone courage (that is, courageous but risky behavior that gets EMS personnel killed) and the importance of responder safety have long been presented in EMS training programs, but may be diluted by traditions, peer pressure and practices such as commendations for heroism, even posthumously. (See statement from the National Fallen Firefighters Foundation under "Reinforcement of Unsafe Behaviors," above.)

Misperceptions Regarding Patient Safety. Although no published research supports this, there is an anecdotal belief, expressed by EMS stakeholders attending the National EMS Culture of Safety Conference in June 2011 in Washington, D.C., that many EMS personnel do not fully understand the concept of patient safety, particularly when it comes to medical errors or harm that results from errors of commission or omission. Typically, they think of patient safety as protecting the patient from injury resulting from drops or crashes.

Cynicism/Mistrust of Leadership. EMS stakeholders participating in developing this strategy described a common (although not universal) cultural phenomenon in which field-level EMS practitioners do not trust leadership and/or respond cynically to leadership directives and initiatives. This may be rooted in the often unreasonable expectations that individuals must somehow perform to a very high standard despite limited resources and difficult circumstances, combined with a sense that administrators are too far removed from the reality of the field to understand the concerns of EMS field personnel. This could present an obstacle when it comes to implementing a culture of safety, although experts report successes with organizations that sincerely invest in safety-culture initiatives with visible, firm support from top management.

"Check the Box" Safety. EMS culture often treats safety as a one-time, static consideration, checklist-style. EMT and paramedic testing typically requires candidates to ask whether the scene is safe before entering, but the answer is almost always yes, and safety is not typically a permeating consideration in such testing. This reinforces a limited view of safety, commonly focused more on external or event-based safety problems such as traffic hazards or downed power lines, rather than on internal, system or process-related safety concerns.

"Undoing" Education. In some cases, newly hired EMTs and paramedics are paired with a partner or field training officer who either intentionally or unintentionally "undoes" responder-safety and patient-safety habits and beliefs instilled in the new employee's initial education program. This is commonly described as the "that was all well and good in the classroom, but now let me show you how we do it in the real world" effect.

Cultural Attitudes About Provider Mental Health. Cultural attitudes toward provider mental health are a powerful influence on whether or not a responder is willing to seek help for stress reactions related to EMS work. There is direct and powerful messaging to new EMS personnel that "if you can't handle it, you don't

belong here." This attitude discourages conversation that may normalize stress reactions and allow for permission to seek assistance when needed; it also stigmatizes those who may be dealing with posttraumatic stress. EMS personnel may not be willing or able to admit when they need assistance, and may continue to work even when they are impaired. Even sub-threshold PTSD has been found to cause levels of social and occupational impairment equivalent to that caused by PTSD, with a presumed corresponding reduction in ability to function safely.[53]

Historical Lack of National Priority. Prior to the NEMSAC recommendation that led to this Strategy, there have been a number of prominent documents that have helped shape the course of EMS in the U.S. (1966 White Paper, 1996 *EMS Agenda for the Future*, 1998 *Leadership Guide to Quality Improvement for Emergency Medical Services Systems*, 2000 *EMS Education Agenda for the Future: A Systems Approach*, 2004 *Rural and Frontier Emergency Medical Services Agenda for the Future*, 2006 National Institutes of Medicine *Future of Emergency Care: Emergency Medical Services at the Crossroads*, 2008 *EMS Workforce for the 21st Century: A National Assessment*, 2011 *EMS Workforce Agenda for the Future*, and others). Many of these documents reference responder safety or patient safety in EMS, either directly or indirectly, but until NEMSAC's recommendation, neither topic had risen to the level of a pressing, high-priority need.

IV. Importance of Both Leadership & Field Personnel in Building a Culture of Safety

Numerous published works addressing safety culture have noted the essential role played by the leadership of individual organizations, especially when it comes to patient safety. Indeed, the Institute for Healthcare Innovation (IHI)'s white paper *Leadership Guide to Patient Safety* characterizes the critical role of senior leaders thusly: [54]

> "Leadership is the critical element in a successful patient safety program and is non-delegable. Only senior leaders can productively direct efforts in their health care organizations to foster the culture and commitment required to address the underlying systems causes of medical errors and harm to patients."

The IHI paper identifies the unique role of an organization's leadership in:

- Establishing the value system in the organization;
- Setting strategic goals for activities to be undertaken;
- Aligning efforts within the organization to achieve those goals;
- Providing resources for the creation, spread, and sustainability of effective systems;
- Removing obstacles to improvements for clinicians and staff; and
- Requiring adherence to known practices that will promote patient safety

Stakeholders participating in the development of this Strategy have generally agreed that the role of EMS leadership as it applies to patient safety also extends to responder safety and community safety.

The Strategy notes that an individual organization may have competing goals and values. Organizational leaders play an important role in overtly acknowledging that values such as safety, patient care, privacy and compassion will compete at times.

It is the shared experience of many of those stakeholders that EMS organizational leadership often works to create or support an organizational culture consistent with the goals of improving responder safety and patient safety. However, stakeholders also reported widespread cases in which leadership works to undermine either the organizational culture or the ability of individual EMS field practitioners or field supervisors to act in the interest of responder safety or patient safety. In these cases, leadership's intentions may be good, but they ultimately fail to create support for a culture of safety. Many causes for this phenomenon have been reported anecdotally, chiefly:

- Attention diverted by other issues of perceived higher priority;
- Limited resources;
- Limited or no information/education about safety culture or practices;
- Pressure to meet ongoing demands for services;
- Limited mandates or incentives for proactive safety-related initiatives

Recent research shows that many frontline workers have a "non-positive" perception of EMS management commitment to safety, and that perceptions of workplace safety culture vary widely across EMS organizations.[45]

The National EMS Advisory Council's recent paper *The Role of Leadership in EMS Workplace Safety Culture* described the following core elements of leadership related to safety culture:

- Setting and regularly promoting the expectation for safe operations;
- Communicating a vision of a safe workplace, developing a process for achieving that vision, stimulating and arming co-workers with the resources needed to achieve that vision;
- Adopting safety and a positive safety culture as a value rather than a priority, because the latter are susceptible to change over time;
- Developing and sustaining processes for regular internal and external evaluations of safety conditions in the workplace and disseminating findings to create an "informed culture";
- Providing an avenue for management and front-line workers to recognize the need or availability of innovations that improve the workplace safety;
- Facilitating a variety of process and interventions in and out of the workplace that promote the safety of workers and their families.

There is little data to illustrate the *specific* role that EMS personnel—i.e., EMTs and paramedics—play in a culture of safety. But it is nonetheless evident that these dedicated responders are essential stakeholders in the process of improving safety for themselves, their patients, and members of the public they encounter in the course of their work.
It is therefore critical that wherever possible, activities and initiatives that are designed to improve safety also be evaluated in how they will impact the people whose decisions and actions will ultimately lead to improved safety.

Because of the key importance of both organizational leadership and EMS personnel in building and implementing a culture of safety, the Strategy envisions a construct in which resources, requirements, information, support, feedback and other elements flow to, and through, organizational leadership, as well as to EMS personnel directly, as appropriate. This coordinated effort will motivate and support both the leaders of EMS organizations and individual EMS responders nationwide, in ultimate support of pervasive safety-oriented attitudes and actions among all members of the EMS team, at all levels.

In other words, the desired outcome of the Strategy is a national culture of safety within EMS that both supports and comes from a collection of EMS provider organizations with their own cultures of safety.

Part 4
Elements of a National EMS Culture of Safety

Overview

The Strategy envisions six Elements that will work together to create and support a national culture of safety in EMS (presented without implication as to either importance or order of implementation):

- Just Culture
- Coordinated Support and Resources
- EMS Safety Data System
- EMS Education Initiatives
- EMS Safety Standards
- Requirements for Reporting and Investigation

These Elements were conceived in a consensus process by the Steering Committee for this project and further defined in subsequent group discussions.

These Elements are intended to work cooperatively with Federal, State, regional and local entities, as well as national stakeholder organizations, to channel resources, requirements, information, support, feedback and other elements to, from and among organizational leadership and EMS personnel.

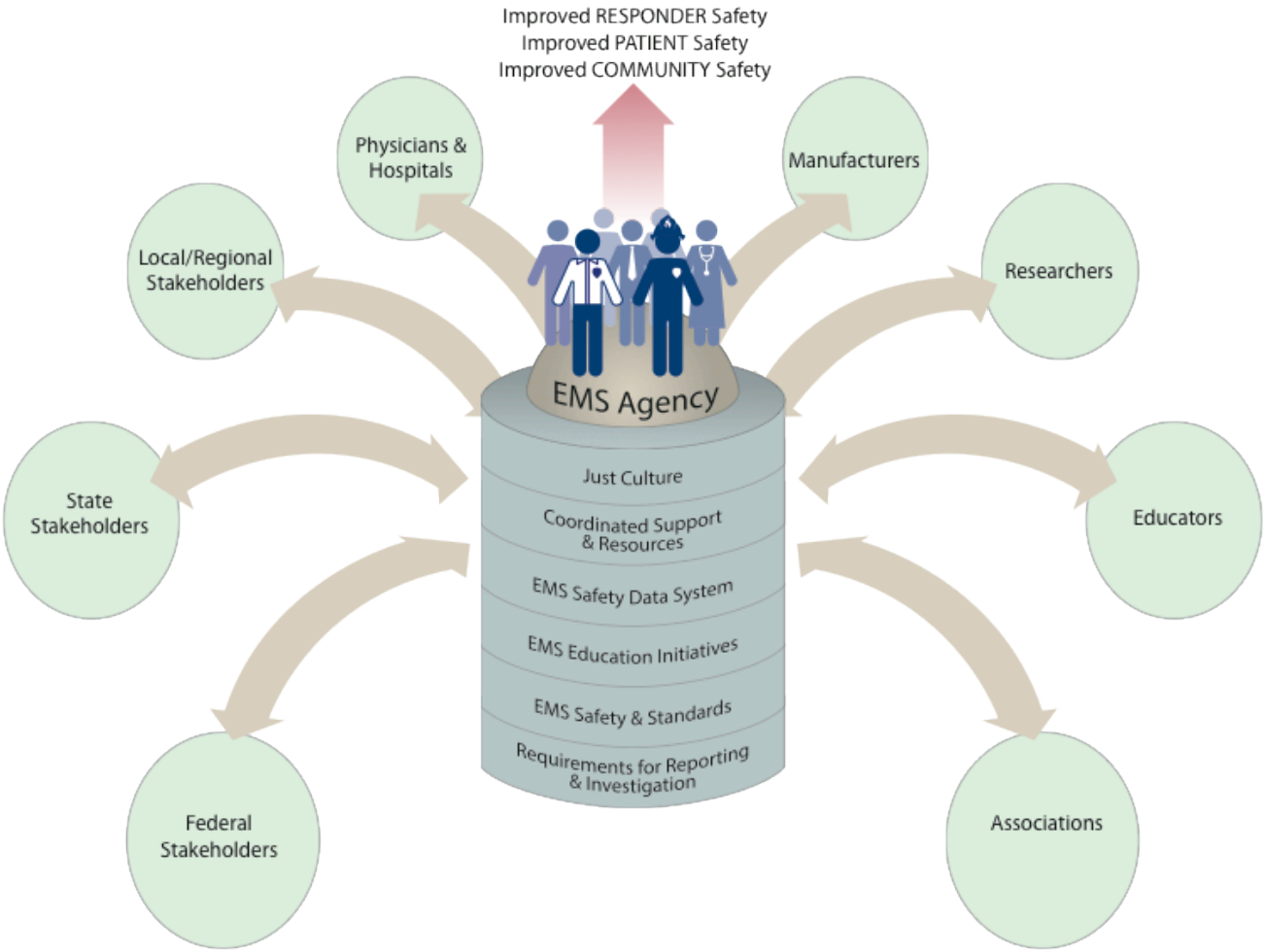
It is the intent of the Strategy to avoid duplicating effort or creating unnecessary overlap. Wherever possible, the Strategy has considered opportunities to build on past work and to partner with existing institutions and entities in envisioning these Elements.

Strategy Framework

The following diagram provides a high-level overview of the envisioned Elements of a culture of safety and its place in the EMS community. They are presented without implication as to either importance or order of implementation.

To be successful, these Elements will require collaboration among many stakeholders. The depictions of components and relationships in this illustration are not intended as a literal, hierarchical or exhaustive representation of the complex EMS universe.

The diagram is provided as a framework to enhance understanding of the Strategy concepts presented throughout this document.



Element 1: Just Culture

The Strategy envisions a Culture of Safety within EMS that embodies values similar to those of a school of thought known as Just Culture. Widely adopted throughout healthcare, aviation and a growing number of other fields, Just Culture is an *open-source, non-proprietary approach that embodies fairness and accountability*. It describes an organizational environment that encourages individuals to report mistakes so that the precursors to errors can be better understood in order to fix system issues.

A prevailing blame culture in healthcare has been suggested as a major source of an unacceptably high number of medical errors, and blame culture is more likely to occur in organizations that rely predominantly on the type of functional management systems typical in EMS—i.e., hierarchical and compliance based.[55]

In testimony before Congress in January 2000, Lucian Leape, M.D., a member of the Quality of Health Care in America Committee at the Institute of Medicine and adjunct professor of the Harvard School of Public Health, noted the following:

> *"Approaches that focus on punishing individuals instead of changing systems provide strong incentives for people to report only those errors they cannot hide. Thus, a punitive approach shuts off the information that is needed to identify faulty systems and create safer ones. In a punitive system, no one learns from their mistakes."*[56]

Dr. Leape's observation speaks to the need for a concept like Just Culture. Such a concept creates an atmosphere of trust, in which people are encouraged—or even rewarded—for reporting essential safety-related information, but in which they understand the difference between acceptable and unacceptable behavior. It also supports learning from at-risk behavior, failures and safety incidents.

Just Culture describes three duties, all of which should be already familiar to anyone working in EMS:

The duty to **act.**

The duty to **follow a procedural rule.**

The duty to **avoid causing unjustifiable risk**.

It should be noted that errors have the potential to be caused by a complex array of contributing factors, including failures of process or equipment as well as human factors. Not all errors are random occurrences or the result of failures of practitioners to perform as expected.

Regardless of whether nonhuman factors are involved, when it comes to unsafe acts, Just Culture describes three degrees of behavior:

Human error. Human error describes inadvertent actions in which there is general agreement that the individual should have done something other than what he or she did, and the action(s) inadvertently caused (or could have caused) an undesirable outcome.

At-risk behavior. At-risk behavior describes situations in which an individual makes a choice to engage in a behavior out of a belief that the risk is insignificant, or out of the mistaken belief that the behavior is otherwise justified.

Reckless behavior. Reckless behavior describes a behavioral choice to consciously disregard a substantial and unjustifiable risk.

All three types of behavior warrant a response. Just Culture expert David Marx recommends separating behaviors from outcomes—that is, basing the response to unsafe acts on the behavior itself and the risk it presents, rather than on the outcome (i.e., overlooking unsafe behavior if no harm resulted, and punishing the person involved only when harm occurs). His simplified model for escalating response:[57]

Console human error.
Coach at-risk behavior.
Punish reckless behavior.
…independent of outcome.

The qualifier in the above model (basing the response on the behavior, not the outcome) is a critical component of Just Culture. The opposite approach, basing the severity of the response on the severity of the outcome, is believed to be common in EMS and many conventional fields. However, such an approach ignores the risk created by the behavior, encourages people to hide mistakes, and in fact *rewards* at-risk behavior when there is no negative outcome. In other words, "no harm, no foul" has no place in Just Culture.

Medicine, aviation and a growing number of other fields have made significant moves toward Just Culture in recent years. This is noteworthy not only because of the successes that have been achieved, but as a dramatic example of cultural shift, because Just Culture contrasts with the traditional culture in healthcare and other high-risk disciplines, which often held individuals accountable for all errors or mishaps. Although Just Culture does not hold individuals accountable for system failings over which they have no control, it is not a blame-free model (see description of behavior types that may result in unsafe acts, above). It acknowledges that humans inevitably make mistakes, and that systems should be designed to reduce the chance of harm in the event of such mistakes.

In 2009, the American Nurses Association released a position paper formally endorsing the concept of Just Culture, citing its value in improving patient safety, noting:[58]

"The Just Culture concept establishes an organization-wide mindset that positively impacts the work environment and work outcomes in several ways. The concept promotes a process where mistakes or errors do not result in automatic punishment,

but rather a process to uncover the source of the error. [At-risk behaviors] result in coaching, counseling, and education around the error, ultimately decreasing likelihood of a repeated error. Increased error reporting can lead to revisions in care delivery systems, creating safer environments for patients and individuals to receive services, and giving the nurses and other workers a sense of ownership in the process. The work environment improves as nurses and workers deliver services in safer, better functioning systems, and that the culture of the workplace is one that encourages quality and safety over immediate punishment and blame."

Other models may exist that embody similar values. Such values may increase the likelihood that the steps necessary to create a true culture of safety will be perceived positively by those who will ultimately determine its success or failure—that is, EMS field personnel.

It is important to note that Just Culture is not a substitute for a comprehensive safety management system. Its inclusion as a key element in this Strategy is intended as an important, appealing and achievable first step toward larger cultural change.

Element 2: Coordinated Support & Resources

Advancing EMS responder safety and safety of patients and the public requires participation from a wide variety of stakeholders. This Strategy envisions a centralized function for coordinating this participation and a wide variety of resources, and allowing for a unified, credible message to be presented to the EMS community on a national basis. This, in turn, increases the likelihood of building buy-in among individual EMS provider agencies.

To fulfill this function, the Strategy envisions a centralized resource and coordination center. Its fundamental mission would include:

- Communicating with a broad group of stakeholder organizations of all types to coordinate efforts, for a unified message
- Providing additional visibility in support of a culture of safety in EMS
- Functioning as a communication channel to the EMS community
- Serving as a repository/library/collection of links with "one-stop shopping" for tools, best practices, education, research, standards and related resources that the EMS community can use to advance a culture of safety (e.g., NAEMT's EMS Safety Course and related resources)
- Collaborating with appropriate entities in advancing the other five elements in this Strategy (Just Culture, EMS Safety Data System, EMS Education Initiatives, Standards, and Requirements for Reporting and Investigation)
- Sharing research activities such as those affiliated with the National Academies' Transportation Research Board (TRB)

For ease of reference, this envisioned resource and coordination center has been given the placeholder name EMS Safety Resource Center (EMSSRC).

The Strategy does not envision EMSSRC, in any form it takes, as having oversight, regulatory or enforcement authority, although it would communicate and work closely with existing authorities as appropriate. The Strategy anticipates that EMSSRC's role would be one of support, coordination, monitoring of progress, and sharing of centralized information, rather than a direct, hands-on role in conducting research or implementing specific intervention programs. EMSSRC is envisioned as supplementing and supporting, not replacing, initiatives by stakeholder groups such as associations, researchers, States, etc., and helping communicate success stories and best practices so that the entire EMS community may benefit.

Possible EMSSRC Structures

Although it is the intent of this Strategy to tap into existing resources wherever possible and avoid "reinventing the wheel," several possible structures for EMSSRC have been suggested for consideration. They are presented here in no particular order; no preference is expressed.

1. **Foundation Model:** Under this model, EMSSRC would be chartered and funded as a foundation similar to the National Fallen Firefighters Foundation, with an overseeing board of directors. The foundation model could be applied either to a startup entity or to an existing organization whose scope is expanded to specifically encompass EMSSRC as a core program. *Note:* NFFF was chartered by Congress, which may or may not be necessary for this model to be successful.
2. **Institute Model:** Under this model, EMSSRC would be chartered as an institute similar to the Institute for Healthcare Improvement, funded through a combination of grants, donations, and program fees.
3. **Cooperative Agreement Model:** Under this model, EMSSRC would be housed at a university, institution or non-profit organization. Examples include the Cardiac Arrest Registry to Enhance Survival (CARES), at Emory University, in cooperation with CDC; and the National EMS for Children National Resource Center, housed at Children's National Medical Center, in cooperation with the Health Resources and Services Administration, Maternal and Child Health Bureau.
4. **Association Model:** Under this model, EMSSRC would be maintained by a national stakeholder association or combination of associations.
5. **Combination Model:** Various combinations of the preceding models can also be considered.

However EMSSRC is structured, the Strategy envisions that it would encompass a panel of representatives from a broad spectrum of stakeholder groups, similar to the makeup of the Steering Committee associated with this Strategy.

Also regardless of structure, it is envisioned that EMSSRC would work closely with State EMS officials and a variety of Federal stakeholders with an interest in EMS.

To support its mission in supporting the implementation of the other five Elements described in this Strategy, it will be helpful for EMSSRC to undertake the following support activities:

Outreach and Resources for EMS and Other Stakeholders. EMSSRC is a natural body to take on the task of communicating with the EMS community (both directly and via associations, Federal partners, states, regions, local authorities and similar channels) about the concept of a culture of safety and specific initiatives undertaken. As a safety advocate, EMSSRC is also an appropriate entity to deliver credible, actionable, nationally endorsed information on best practices and safety culture initiatives, continuing education materials for leaders and practitioners, and the like for organizations' use. EMSSRC could also: act as a centralized clearinghouse for data and published research; track safety-related regulations enacted by Federal entities and States and report details to the EMS community; track Federal and State legislation affecting EMS safety, and house model legislation; report on funding sources; coordinate and support collaboration among stakeholder groups; and share news and ideas. Such resources could be made available via an online portal.

Resources for Public Outreach. EMSSRC could house educational materials (such as press-ready brochure files, public service announcements, campaigns, etc.) for use by stakeholder groups and EMS provider agencies in communicating the proactive stance of the EMS profession about patient safety, as well as the

importance of supporting safety initiatives for EMS personnel. Such communication can help build support for EMS safety initiatives, and can also help shape public perception and expectations (helpful in, for example, understanding response times; using EMS appropriately; and attracting prospective workers). Outreach materials may also be helpful in educating the public about yielding to emergency vehicles, being aware of emergency scenes on roadways, appropriate expectations and to correct misperceptions about EMS (for example, the expectation that every call must generate a lights-and-siren response, regardless of the nature of the problem).

Measuring Progress and Success. Working with stakeholder groups, EMSSRC should disseminate criteria, national expectations and milestones for progress toward responder safety and patient safety goals. It should coordinate efforts to track and report on that progress. One tool that may be useful is the national benchmarking survey of attitudes about safety in EMS used by the Emergency Medical Services Agency Research Network (EMSARN) at the University of Pittsburgh.[45] Wherever possible, EMSSRC contributors should use actual data and evidence from the field in measuring progress, and should publicly report on that progress (or lack thereof).

Additional Activities to Consider

Many of the factors considered and/or addressed in the Strategy have been discussed previously, and the envisioned elements may have been previously recommended, in some form, in past efforts that did not focus on safety specifically. The Strategy anticipates that one of the initial activities for EMSSRC will be to review these past recommendations and goals, affirm that they are currently supported, evaluate progress and set up channels of communication with the groups responsible for implementing them.

Specific to patient safety, EMSSRC contributors should consider recommendations in the National EMS Advisory Council Oversight, Analysis, and Research Committee report *Reducing Adverse Events in EMS: Creating a Culture of Safety.* Possible priorities include:

- Leading the development of standards and methodologies to identify and reduce adverse events in EMS
- Exploring possibilities for regulatory or financial incentives to drive patient safety in EMS
- Encouraging peer-reviewed research focused on a system approach to medical errors and patient safety in EMS
- Considering a patient safety reporting system (national vs. state)
- Developing model legislation/regulations regarding patient safety in EMS
- Creating a list of EMS “never events” – that is, particularly shocking adverse events that should never occur, such as the list developed by the National Quality Forum in 2006 for events that should never occur in a hospital (for example, surgery on the wrong body part, discharging an infant to the wrong parent, patient death or serious injury from a fall while being cared for in a hospital, etc.)[59] or the Joint Commission’s “sentinel events” policy[60]
- Defining a taxonomy/data dictionary for EMS adverse event reporting

- Creating or collaborating on, and distributing, a toolkit for local implementation of an EMS patient safety program
- Cataloguing best practices in EMS patient safety
- Seeking opportunities to encourage the Centers for Medicare and Medicaid Services (CMS), in any "value-based purchasing" system developed for EMS, to include a mechanism to financially reward EMS programs that have implemented a culture of safety

Specific to EMS responder safety, EMSSRC contributors should consider recommendations in the *Emergency Medical Services Workforce Agenda for the Future,* including cultivating policies, procedures, training and programs in industries with similar dynamic risk profiles to EMS, such as trucking, shipping, mining and agriculture, and evaluating these programs to establish clear workforce safety practices and procedures.

The same document also identifies such priorities as:

- Identifying successful wellness programs from other industries and tailoring them to the EMS community
- Establishing regular forums for sharing best practices with provider groups
- Extending awareness of the culture of safety into educational programs so that new workers enter the field with a broader appreciation for their own safety and well-being and that of their peers

The *Workforce Agenda* does not directly address patient safety or medical errors in the prehospital setting.

EMSSRC contributors should also consider the strategic goals identified in the report of the National Public Safety Sub-Sector Agenda for Occupational Safety and Health Research Practice in the U.S., under the National Occupational Research Agenda (NORA). The *Emergency Medical Services Workforce Agenda for the Future* cites five strategic goals identified for EMS in the above document (including any updated timelines):

- "Reduce traumatic injury and fatalities among EMS personnel associated with vehicle crashes…"
- "Reduce traumatic injuries among EMS personnel that occur during movement of patients and equipment…"
- "Reduce hazardous exposures to EMS personnel through effective design and use of PPE, and proper work practices…"
- "Identify and implement effective policies among EMS agencies regarding work organization factors to reduce related illnesses and injuries…"
- "Create an integrated occupational health and safety surveillance data system for Emergency Medical Services (EMS) personnel and evaluate risks for their exposures, illnesses, injuries, and fatalities…"

Furthermore, EMSSRC contributors should consider other goals identified in the NORA document, such as improving EMS vehicle design and developing guidelines for EMS worksite medical surveillance and wellness programs.

Element 3: EMS Safety Data System

There is a pressing need to understand the scope, frequency and nature of EMS responder injuries and adverse medical events, in order to project the cost to the EMS profession; the impact on EMS personnel; the cost to patients; and the cost to society, as well as to identify priorities, set goals and measure progress toward a culture of safety.

Currently, data that could help build an understanding of these issues may be housed in many different places. In one of the largest EMS agencies in the country, for example, the occupational injury data system is an Excel file created and maintained by a single lieutenant. In addition to residing in thousands of data systems, information is not reported uniformly and lacks a common data dictionary.

Making data more accessible and useful can enable that data to support recommendations and conclusions. As a first step toward this, the Strategy envisions a national EMS Safety Data System as a key element. This is envisioned as a national, robust, well-designed, secure data system encompassing key information about EMS safety, made available for research and policy-makers, as well as use by national stakeholder organizations and individual EMS provider agencies. It should be noted that the Strategy envisions the National EMS Safety Data System as a data *system* linking and communicating with existing data systems, rather than a new data*base.*

When it comes to data elements, it is important to consider the concept of a data dictionary, or standardized measures/definitions/metrics to promote the adoption of one set of language that allows for comparisons and aggregate datasets.

Any useful data systems must also capture *denominator* data. For EMS occupational injuries, for example, that denominator data must include many factors, including hours worked (by gender and job title), call volume and miles driven, among others.

Considerations From Past Works

The designers of the data system may benefit from a review of a 2007 NHTSA-sponsored report, *Feasibility for an EMS Workforce Safety and Health Surveillance System*, which offered rationale for a comprehensive program for surveillance of EMS illness and injury rates.[61] The report recommended the creation of a National EMS Workforce Injury and Illness Surveillance Program (EMS-WIISP).

The *Emergency Medical Services Workforce Agenda for the Future* describes the value of research and injury surveillance, including such data as:[62]

- Types and prevalence of illness and injury;
- Incidence of disability and mortality;
- Etiology of illness and injury;
- Workforce demographics;
- “Near miss” incidents;

- Vehicle crash-related morbidity and mortality

The same paper also endorses fundamental research questions that should be routinely addressed, including, for example:

- Risk of experiencing illness and injury;
- Impact of illness and injury on the workforce and the overall EMS industry, including
    - Recruitment
    - Retention
    - Economic cost to industry

Applying Lessons Learned

The Strategy envisions that the National EMS Responder and Patient Safety Data System would apply lessons learned from successful data-centric initiatives such as the International Association of Fire Chiefs' (IAFC's) Near Miss Database, (http://www.firefighternearmiss.com/) which has been up and running since 2005 and has received broad cooperation from the fire service nationwide in gathering meaningful information.[63] One key lesson from the success of the Near Miss Database is its strategy for providing information back to participants, which further encourages their cooperation and participation. The IAFC's EMS Section would be a valuable ally in structuring the National EMS Responder and Patient Safety Data System and encouraging its use.

The North Carolina EMS Data System is one example of the successful development of a large, fully integrated, comprehensive EMS data and quality improvement effort at the statewide level.[64] The program has achieved significant improvements in the quality of EMS service delivery, patient care and integrated systems of care. Consistent with the goals of the 2007 Institute of Medicine's recommendations for EMS, the linkage of the North Carolina EMS Data System with other healthcare registries has created an environment that can evaluate larger systems of care and ultimate patient outcomes.

Another data initiative that should be considered in forming the National EMS Responder and Patient Safety Data System are the EMS Near Miss and EMS Line of Duty Death online reporting forms and database developed by the National Association of Emergency Medical Technicians (NAEMT) in collaboration with the Center for Leadership, Innovation and Research in EMS and supported by the National Association of State EMS Officials (NASEMSO). These tools are included in NAEMT's EMS Voluntary Event Notification Notification Tool (E.V.E.N.T.), which was launched in March 2012.

Additional data-related considerations relevant to the National EMS Responder and Patient Safety Data System include the National Quality Forum's (NQF's) "never events" [59] and Joint Commission recommendations.[60]

Need to Consider Dual Aspects of Patient Safety

One potential concern that must be addressed in developing the national EMS Safety Data System is the need to accommodate two distinct aspects of patient safety unique to EMS—first, protection of patients from physical harm (for example, from crashes, failures of transport equipment, or improper handling); and, second, prevention of medical errors that lead to patient harm (such as incorrect doses of medication, improper diagnoses, missed intubations, etc.). These distinct aspects of EMS patient safety are often the responsibility of two different branches in EMS organizations; the former is typically within the purview of the health and safety officer (or equivalent), while the latter is typically the responsibility of the medical director and quality improvement manager (or equivalent). It is essential to recognize this distinction in creating a system that will facilitate effective reporting and accuracy.

Need to Analyze Opportunities to Incorporate NEMSIS Data

A careful analysis of the National EMS Information System (NEMSIS) should be made to determine the utility of its data for enhancing an EMS Culture of Safety. It is likely that some NEMSIS data will be useful with regard to patient safety issues involving treatment. However, NEMSIS does not offer this same usefulness when it comes to providing data related to patients who are physically harmed while under EMS care (for example, in an ambulance crash). Further, as a *patient*-focused reporting system, NEMSIS does not provide a way to track injuries sustained by EMS personnel, or line-of-duty deaths.

Need to Consider What Data Will Be Included in the National EMS Responder and Patient Safety Data System

The Strategy anticipates that the data for the EMS Safety Data System will come from numerous sources rather than a single entry point. In addition to the sources referred to above, it is possible that individual State agencies will develop their own safety databases for EMS. In view of this, a process similar to that used to develop NEMSIS may be useful in developing the EMS Safety Data System. A core set of data points can be identified and agreed upon, and shared with the partner entities, which would then ensure that the data was appropriately and compatibly captured in their own systems. Following this, mechanisms for sharing data among systems following accepted standards would need to be developed.

It may also be helpful to consider a survey of current safety needs to identify what data will be most useful.

Opportunity to Consider Data Gathered by Insurance Carriers

The developers of the EMS Safety Data System should evaluate the usefulness of data gathered by insurance carriers (e.g., the Healthcare Cost and Utilization Project (HCUP) at the Agency for Healthcare Research and Quality (AHRQ), which tracks hospital inpatient care statistical information).

Need to Capture Broad Occupational Health Data

The EMS community would benefit from surveillance of both mental and physical health conditions among EMS personnel, as both may lead to negative outcomes. Stress exposure has been linked empirically with both psychological dysfunction and physical illness.

Need to Consider Privacy and Liability Concerns

It is essential to consider possible obstacles to sharing data, or restrictions on how data may be shared and with whom, in developing the EMS Safety Data System. Such obstacles could include HIPAA and State privacy laws, organizational policies, cultural resistance to revealing sensitive data, the need for protection from legal liability, and related issues. Legal advice on relevant issues is essential for the designers of such a system, to form a strong understanding of what is allowed (particularly by HIPAA) and what is not. Supporting documentation should be made available for use by reporting agencies, to remove obstacles to sharing (real or perceived).

Protection from legal liability related to the reporting of events and data may be available under a patient safety organization (PSO). Under such organizations, those submitting data are protected under the Patient Safety and Quality Improvement Act of 2005. PSOs are overseen by AHRQ (http://www.pso.ahrq.gov/index.html). The EMS Safety Data System could be formed as part of a patient safety center that is also a PSO.

Element 4: EMS Education Initiatives

EMS education (both initial programs and continuing education) represents a significant opportunity for delivering both responder safety and patient safety information, changing attitudes, and creating a national culture of safety in EMS.[65, 66] As such, it is key to this Strategy.

The Strategy acknowledges that cultural change takes time, often measured in generations. Education-related initiatives related to safety can seek to create cultural change among current EMS team members, and those just entering the workforce via an educational program.

Need to Include Leaders in Safety Education

The Strategy also acknowledges the widely accepted view among safety experts that successful implementation of safety culture hinges on the sincere buy-in from organization-level leadership. The educational component of the Strategy envisions delivering education to both leaders and practitioners at all levels, to equip them with the information they need to "own" EMS responder and patient safety. (Note: The *EMS Education Agenda for the Future* (2000) focused on practitioner-level education and training, rather than leadership, but this should not be viewed as an implication that leadership education should not be a priority.)

Individuals who advance to EMS leadership positions often (although not always) are promoted from within, i.e., from positions as field practitioners. They often must learn leadership skills and competencies "on the job." The National EMS Management Association (NEMSMA) *Leadership Agenda for the Future* notes:[67]

> "In more than 40 years of visioning and creating modern EMS, the industry has been blind to the need for structured EMS leadership and management development….Today, EMS management development mirrors the scattered evolution of the industry. There has been no consensus on management levels and titles or the competencies needed to fulfill those levels. There are no common educational paths or widely accepted curricula for management development, and no widely recognized credentials for EMS managers."

A more systematic approach should be charted for how EMS leaders are educated, or possibly certified, which should strongly emphasize responder safety, patient safety and the concepts of Just Culture.

Need for Early Identification of At-Risk Candidates

Initial EMS education represents the gateway between the pool of potential workers and employment (or volunteer positions) in EMS. The Strategy envisions that entities conducting EMS education (for example, technical schools teaching EMT programs and colleges or college-affiliated programs offering paramedic courses) actively identify candidates who are at

higher risk for dangerous behavior or risk-seeking attitudes, and provide a higher level of focus to those individuals for a greater understanding of safety concerns.

Need to Build Clinical Judgment

The Strategy also recognizes that changes should be encouraged or mandated in the education of EMS personnel, with greater emphasis on creating practitioners who are capable of critical thinking, beyond a focus on technical skills only. It is the belief of stakeholders participating in the development of the Strategy that individuals who are more rounded in clinical thinking skills—as opposed to individuals who are trained to repeat tasks—can more easily assimilate concepts such as a culture of safety.

Accordingly, the Strategy envisions that the goal of the EMS educational process at all points would be not to simply develop skills proficiency but to develop the foundation for clinical judgment. When an EMS practitioner is able to take the whole patient's medical situation into account, there is a greater opportunity for critical thinking and problem-solving in the approach to treatment.

This philosophy is consistent with the position of the Canadian Patient Safety Institute in its report *Patient Safety in Emergency Medical Services: Advancing and Aligning the Culture of Patient Safety in EMS,* which described good clinical judgment as the greatest safety feature of EMS systems (and poor clinical judgment as the greatest risk to safety).[68]

The National EMS Education Standards (2009) are an important consideration in supporting the development of better EMS clinicians through the education process. This document is a natural and essential element to include in assessing opportunities for building greater EMS clinical judgment through education.

Transitioning New Employees

Related to transitioning new employees into the workplace, it is important to note an observation made in the EMS Culture section of this Strategy, about a phenomenon that may impede the effectiveness of any education-related initiatives toward a culture of safety:

> *In many cases, newly hired EMTs and paramedics are paired with a partner or field training officer who either intentionally or unintentionally "undoes" responder-safety and patient-safety habits and beliefs instilled in the new employee's educational program. This is commonly described as the "that was all well and good in the classroom, but now let me show you how we do it in the real world" effect.*

To avoid this, a better transition model is needed so that what is learned in the classroom stays with the individual throughout his or her career. Greater use of realistic simulation and "real world" scenarios, or a more gradual transition from education to duty, may be beneficial. Further, field training educators should not only have preparation for doing the job, but it would be beneficial to a culture of safety for that preparation to support a more strategic goal

of preparing them to be future instructors and academics. Accordingly, such field training instructor programs could also offer academic credit.

It should be noted that the National EMS Management Association, in recognizing the challenge of transitioning new employees, recently created the EMS Field Training and Evaluation Program (FTEP), which seeks to standardize and improve organizations' approach to this critical, but often overlooked, element of education.

Need to Integrate Safety Into Every Component of EMS Education

The Strategy envisions recruitment and education beyond the classroom as vitally important to the successful implementation of a culture of safety, to include:

- Educating recruits about the job before they join (countering impressions about the "glamorous" lights-and-sirens nature of EMS work)
- Instilling a deep understanding that safety is an ever-present, ever-important consideration in EMS work, but acknowledging that sometimes safety considerations conflict with other important values
- Refusing to allow safety education to be set aside once on the job, to include understanding the human tendency to rationalize repeating at-risk behaviors simply because they have not resulted in negative outcomes in the past
- Educating the next generations of EMS team members to be safety-oriented in everything they do, and providing them leadership to support safety procedures and maintain accountability for behaviors regardless of outcomes
- Setting an expectation for life-long learning
- Setting the foundation for a career-long understanding of the importance of personal health, physical fitness, maintaining emotional health and avoiding substance abuse.

The Strategy recognizes that all generations do not learn the same way, and that opportunities should be sought to deliver educational information in a variety of ways, including via apps, mobile methods, social media and other methods.

The Strategy envisions a significant evolution of the EMS education process, in which the values and practical elements of a culture of safety are *fully integrated into each component of EMS education.* This is in keeping with the need expressed in the 1996 NHTSA document *EMS Agenda for the Future*. Under this model, the safety of practitioners, patients and the public would be a persistent, pervasive consideration.

Element 5: EMS Safety Standards

The Strategy envisions that the EMS Safety Resource Center will pursue, as part of its core mission, the promotion of standards in EMS that will enhance safety for EMS practitioners, patients and members of the public whom EMS encounters in the course of its work. Standards are envisioned as encompassing both responder safety and patient safety.

The Strategy envisions the following considerations applicable to EMSSRC in its mission to promote safety-related standards in EMS:

Scope of Mission Related to Standards

It is not the vision of the Strategy that EMSSRC will be a standards development organization in its own right, or that it will duplicate valuable work already performed. Rather, it is expected that EMSSRC will act as a coordination/clearinghouse for the past and future work of other organizations. EMSSRC should work closely with standards development organizations in emergency services and healthcare, review standards using accepted processes, and promulgate those standards to the EMS community. It is anticipated that this would represent ongoing work, as the need for standards grows with the needs of the profession, the needs of patients, and the ever-evolving body of scientific knowledge. This ongoing work would also include advocating for new processes and standards.

Evidence-Based Approach

Organizations involved in development of standards should follow an accepted process—that is, one based on literature/evidence, data and consensus—in selecting and sharing standards. It should be noted that there needs to be more funding for research to develop and support standards.

Initial Work Needed to Develop Standards to Be Addressed

EMSSRC should engage in a collaborative process with experts to develop a prioritized list of standards to be addressed or created by appropriate organizations. High priority should be given to standards that support safety not only from an operational or technical viewpoint, but from a cultural perspective as well. Possible items for consideration include the following (Note: This is a limited list, from topics raised at the National EMS Culture of Safety Stakeholder Conference and via public comment during the development of the Strategy):

- Physical fitness for practitioners (may be preferable for this to initially emerge as recommendations or guidelines rather than standards)
- Shifts/fatigue
- Categorizing and reporting violence against EMS personnel; model legislation outlawing such acts; standards for training to prevent/counter violence and prevent injuries to EMS personnel and patients
- Checking driver records and similar employment screening

- Quality improvement and supervision
- Medical equipment and patient-moving equipment; making equipment loads manageable
- Ambulance design, maintenance, etc.
- Dispatch standards: Encouragement of prioritized dispatch protocols, for ground and air, to ensure that the response is commensurate with the nature of the emergency and that unjustified risk is minimized
- Patient safety considerations specific to equipment design (example: standardization of anesthesia machines led to measured reductions in errors)
- Use of personal protective equipment (PPE) by provider and patient
- Standardized description of the role and qualifications of an EMS safety officer
- Safety competencies
- Standards for safety-related information communicated to responders, to include anticipated data available through Next Generation 911

Element 6: Requirements for Reporting & Investigation

To successfully implement a culture of safety in EMS that will support improvements in safety for responders, patients and members of the public, and to support the creation and population of a national EMS safety data system, the Strategy acknowledges the importance of mandates for reporting of standardized data by all EMS provider agencies.

EMS vehicle crashes represent a high-profile risk for EMS practitioners, EMS patients and the public. Very little is known about the true number of EMS vehicle crashes, and even less is known about the number of incidents in which an EMS vehicle was indirectly involved (so-called “wake effect” crashes). Further, little is known about non-crash incidents involving EMS vehicular operations (e.g., an EMT in the back of the ambulance being injured by a sudden stop or turn). The Strategy envisions mandatory investigation of all crashes and other EMS vehicular incidents that meet certain severity criteria.

It is not currently envisioned that EMSSRC would play a direct role in investigating crashes, but would be a partner in efforts to develop a mechanism for such investigation.

Other high-profile risks for EMS personnel, patients and the public should be identified and prioritized.

Steps for developing reporting may include:

1. **Determining what data types are necessary and useful.** This could include surveying experts to identify the types of information that would be critical for investigation of incidents; identifying high-risk activities, conditions and locations; identifying opportunities for interventions/preventive measures that are most likely to yield improvements, and other criteria.
2. **Determining what data may already be available or mandated.** It is not currently known how many States mandate reporting of vehicle incidents that meet specified criteria, or what is done with the information obtained through such mechanisms. Surveying States to identify existing reporting and investigation requirements is an essential step. This survey should include types of data collected, compliance rates, the ways data is used, how investigations are conducted and by whom, and related information.
3. **Learning from those with hands-on experience.** In gathering information to determine the most appropriate approach, it would be especially helpful for stakeholders to consult with, or even receive direct assistance from, one or more Federal entities that have specific experience in collecting mandated reports and conducting investigations, e.g., the CDC’s National Institute for Occupational Safety and Health (NIOSH) and/or the National Transportation Safety Board (NTSB).
4. **Assigning and obtaining authorization for an investigative body.** A likely entity to conduct mandatory investigations is not known, but there may be significant advantages to assign such responsibility to an organization with relevant experience. Investigations should involve cooperation/communication with local authorities to obtain information.
5. **Identifying existing best practices.** Qualified experts could identify best practices for collecting data, investigating incidents that meet relevant criteria, sharing findings

and ensuring that the resulting information is used in a way that benefits the profession or industry in question.

Additional Considerations

Mandatory vs. Voluntary: There is a general agreement among stakeholders participating in the development of this Strategy that some reporting should be voluntary and some should be mandated. There is no strong sense, however, of where that line should be drawn. Even if data reporting is mandated, high compliance rates may not automatically result. Nevertheless, the Strategy envisions that stronger mandates will result in more complete, more accurate data being gathered, more quickly—and an accompanying increase in the ability to share findings that will affect policy decisions aimed at improving EMS safety. This issue could be tied to funding; that is, each agency would know that supplying *x* data (the minimum) would result in *y* dollars, and that supplying *x*+2 data (the ideal) would result in *y*+2 dollars. It should also be noted that any attempt at improving reporting will be long and complex, and penalties would likely make it longer and more difficult. Not every agency will be able to submit additional reports; focusing on the ones that do and rewarding them for the efforts may be the most effective approach.

Documentation: The bottom-up nature of reporting by EMS personnel and medical directors must be acknowledged. All stakeholders should understand the role that proper documentation plays in improving safety in EMS systems.

Enforcement & Sanctions: The Strategy envisions that any mandates for reporting will have far greater compliance if they are supported by incentives for compliance or penalties for noncompliance. The Strategy anticipates that the greatest compliance will result, and that reporting will be most efficient, if mandatory collection of data is conducted at the State level, with data collated and forwarded to EMSSRC.

Sharing of Best Practices: Agencies may be more likely to comply with reporting mandates if they see a benefit to participating. EMSSRC should regularly share best practices for how incidents, crashes, injuries, etc., can best be handled by individual agencies, using data from the reporting process and the results of investigations.

Anonymous Reporting: The system should include a channel for anonymous reporting, even by individuals. One model for consideration is the Firefighter Near Miss System, in which individuals typically can access the system and submit a report in 10 minutes or less, even if they have no expertise or experience in doing so. Another is the National Association of Emergency Medical Technicians' E.V.E.N.T. Reporting System. The reporting channel should be both accessible and standardized.

Legal Implications: Considerable resistance can be expected from organizational risk managers if they fear that plaintiffs' attorneys will subpoena incident- or practitioner-related information reported via a mandatory reporting system. Mandated reporting should be supported by legal protection from use in claims against provider organizations that report

incidents. There is ample precedent for such protection accompanying reporting requirements in the hospital arena.

Evidence-Based Process: The reporting and investigative component of the Strategy should follow an evidence-based, data-guided approach, especially in identifying key focus areas where the greatest benefit is possible in protecting EMS personnel, patients and the public, and to reduce the likelihood of harmful outcomes resulting from inevitable human error.

Importance of Denominator Data: Any attempt at improving numerator data collection must also address the need for appropriate denominator data. For example, knowing how many crashes an agency had in a given time period is less useful if the data does not also include how many miles its ambulance fleet was driven in the same period, or how many hours its employees worked, or many hours the driver involved in the ambulance crash had worked within the preceding 24 hours, etc.

Part 5
Conclusion & Next Steps

I. Conclusion

EMS is an important partner in the nation's healthcare system, and a critical element in national security and disaster preparedness. Yet EMS operations potentially expose EMS personnel, patients and members of the community to preventable risk of serious harm. This contrasts with advances in safety practices that have been successfully implemented in many healthcare and other settings in recent years.

This Strategy attempts to balance four key desires of the EMS community:

- The desire to help people, often at a time when they need it most
- The desire for pragmatic, immediately actionable steps that can be applied locally as well as nationally
- The desire for strategic, visionary initiatives that will support and empower such steps, and all stakeholder efforts to improve safety outcomes
- The desire to make evidence-based decisions

The structure and culture of EMS, and particularly its variability in service delivery models, present numerous obstacles to creating a national EMS culture of safety. But the very purpose of EMS is to help, not harm, and EMS stakeholders have resoundingly echoed the idea that the time has come to implement a culture of safety in the profession.

II. Next Steps

Throughout the development of the Strategy, and most recently during the National Review Meeting in June 2012, EMS stakeholders have indicated their desire to move forward now, even before this Strategy is fully implemented.

Accordingly, a list of ideas was developed from Steering Committee and EMS community input throughout the development of the Strategy. The ideas are presented here grouped by stakeholder types and mapped where possible to the six Elements of the Strategy. It may be possible to implement some of the ideas now, or to begin laying groundwork. Some ideas may also form the basis for an eventual toolkit for local EMS provider agencies to use in building their own culture of safety.

The list is presented without implication as to either importance or order of implementation. It is expected that this list will function as a "living document" subject to ongoing additions, edits and reprioritizing. It is not represented as exclusive (i.e., any exclusion should not be assumed to be intentional).

Individual EMS Personnel

- Collaborate with EMS management in the development, promotion, and implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs to facilitate an honest and prompt reporting of mishaps and errors.
- Support the need for coordination of all EMS safety related programs at the local, regional, state, and federal levels to share items such as best practices and improved safety standards.
- Support the need for better national EMS responder and patient data collection and participate in systems currently available such as the E.V.E.N.T. system.
- Support increased EMS educational initiatives to address EMS system safety and a new culture of safety for EMS and seek opportunities to expand their knowledge base on culture, patient safety, and research on clinical safety, responder safety, personal protective equipment, etc.
- Cooperate in the development of new and improved safety standards that affect all aspects of the EMS system such as participating with studies in safety related research.
- Support the creation of a national EMS safety data system that collects both patient and EMS personnel data.

EMS Provider Agencies

- Collaborate with EMS personnel in the development, promotion, and implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs and make EMS safety a corporate value.

- Promote the need for coordination of all EMS safety related programs at the local, regional, state, and federal levels and integrate these into the agencies SOP's.
- Promote the need for better national EMS responder and patient data collection and facilitate EMS personnel participation in systems currently available such as the E.V.E.N.T. system.
- Support new EMS educational safety initiatives within initial EMS education curriculum and through other certification courses such as NAEMT's EMS Safety Course.
- Promote the development of new and improved safety standards that affect all aspects of the EMS system based on best practices and successful safety programs.
- Support the creation of a national EMS safety data system that collects both patient and EMS personnel data.

EMS Physicians & Medical Directors

- Collaborate with EMS management and EMS personnel in the development, promotion, and implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs and promote EMS safety as a corporate value.
- Advocate the need for coordination of EMS safety related programs at the local, regional, state, and federal levels and integrate these into the agencies clinical protocols where applicable.
- Promote the need for better national EMS responder and patient data collection and facilitate EMS personnel participation in systems currently available such as the E.V.E.N.T. system.
- Support new EMS safety educational initiatives during initial EMS education.
- Encourage the development of new and improved safety standards that affect all aspects of the EMS system that are referenced to existing Quality Improvement data.
- Advocate for the creation of a national EMS safety data system that collects both patient and EMS personnel data.

Associations

- Support the development and implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs.
- Advocate the need for coordination of EMS safety related programs at the local, regional, state, and federal levels.
- Support the need for better national EMS responder and patient data collection and facilitate EMS personnel participation in systems currently available such as the E.V.E.N.T. system.
- Encourage new EMS safety educational initiatives during the initial curriculum and promote the use of certification courses.
- Advocate for the development of new and improved safety standards that affect all aspects of the EMS system that are based on established best practices and benchmarks.

- Advocate for the creation of a national EMS safety data system that collects both patient and EMS personnel data.

Educators

- Support the development and implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs and.
- Advocate the need for coordination of EMS safety related programs at the local, regional, state, and federal levels.
- Support the need for better national EMS responder and patient data collection and facilitate EMS personnel participation in systems currently available such as the E.V.E.N.T. system.
- Participate in the development of new EMS safety educational initiatives in the initial education curriculum and promote the use of existing safety related certification courses.
- Support the development of new and improved safety standards that affect all aspects of the EMS system that include topics such as health, nutrition, wellness and fitness.
- Advocate for the creation of a national EMS safety data system that collects both patient and EMS personnel data.

Standards Development Organizations (e.g., NFPA, ASTM, CAAS)

- Promote the development and implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs.
- Support the need for coordination of EMS safety related programs at the local, regional, state, and federal levels.
- Support the need for better national EMS responder and patient data collection and facilitate EMS personnel participation in systems currently available such as the E.V.E.N.T. system.
- Promote new EMS educational initiatives to address EMS system safety and promote the use of certification courses such as NAEMT's EMS Safety Course.
- Develop new and improved safety standards that affect all aspects of the EMS system such as safer vehicle design and human factors engineering.
- Participate in the creation of a national EMS safety data system that collects both patient and EMS personnel data.

Local Government Stakeholders

- Promote the implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs.
- Assist in the coordination of EMS safety related programs at the local, regional, state, and federal levels.

- Support the need for better national EMS responder and patient data collection and participation in systems currently available such as the E.V.E.N.T. system.
- Promote new EMS educational initiatives to address EMS system safety and promote the use of certification courses such as NAEMT's EMS Safety Course.
- Support the development of new and improved safety standards that affect all aspects of the EMS system such as safer vehicle design and human factors engineering.
- Support the creation of a national EMS safety data system that collects both patient and EMS personnel data.

State Government Stakeholders

- Implement a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs through state laws and regulations.
- Participate in the coordination of EMS safety related programs at the local, regional, state, and federal levels.
- Support the need for better national EMS responder and patient data collection and participation in systems currently available such as the E.V.E.N.T. system.
- Promote new EMS safety educational initiatives during initial education and promote the use of existing safety certification courses.
- Support the development of new and improved safety standards that affect all aspects of the EMS system such as safer vehicle design and human factors engineering.
- Support the creation of a national EMS safety data system that collects both patient and EMS personnel data.

Researchers

- Support the development and implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs.
- Participate in the coordination of EMS safety related programs at the local, regional, state, and federal levels.
- Support the need for better national EMS responder and patient data collection and participation in systems currently available such as the E.V.E.N.T. system.
- Support new EMS safety educational initiatives during initial EMS education and promote the use of existing safety certification courses.
- Participate in the development of new and improved safety standards that affect all aspects of the EMS system such as safer vehicle design and human factors engineering.
- Participate in the creation of a national EMS safety data system that collects both patient and EMS personnel data and develop safety based best practices.

EMS Vendors and Manufacturers

- Support the implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs.
- Support the coordination of EMS safety related programs at the local, regional, state, and federal levels.

- Support the need for better national EMS responder and patient data collection and participation in systems currently available such as the E.V.E.N.T. system.
- Support new EMS educational initiatives to address EMS system safety and promote the use of certification courses such as NAEMT's EMS Safety Course.
- Support the development of new and improved safety standards that affect all aspects of the EMS system such as safer vehicle design and human factors engineering.
- Support the creation of a national EMS safety data system that collects both patient and EMS personnel data.

EMS Media & Conferences

- Promote the implementation of a comprehensive system-wide safety program for their EMS system such as Just Culture or other similar programs.
- Promote the coordination of EMS safety related programs at the local, regional, state, and federal levels.
- Promote the need for better national EMS responder and patient data collection and participation in systems currently available such as the E.V.E.N.T. system.
- Provide new EMS safety educational initiatives during initial EMS education and promote the use of existing certification courses.
- Promote the development of new and improved safety standards that affect all aspects of the EMS system.
- Promote the creation of a national EMS safety data system that collects both patient and EMS personnel data.

Appendices

I. Project Origin

This project is being produced under a cooperative agreement between the National Highway Traffic Safety Administration (NHTSA), with support from the Health Resources and Services Administration's (HRSA) EMS for Children (EMSC) Program, and the American College of Emergency Physicians (ACEP).

The Strategy stems from a recommendation by the National Emergency Medical Services Advisory Council (NEMSAC). The Council is a Federal advisory committee that serves as a nationally recognized council of EMS representatives and consumers to provide advice and recommendations regarding EMS to the Department of Transportation's National Highway Traffic Safety Administration (NHTSA). In 2009, NEMSAC recommended that NHTSA create a strategy for building a culture of safety in emergency medical services.

NEMSAC characterized developing a culture of safety in EMS as its "top priority" recommendation, chosen via a systematic, evidence- and consensus-based process from among more than 80 possible issues to be addressed, in categories such as: structure/system; education/certification/workforce; funding/billing; public education/information; research/technology/data; medical oversight/quality; disaster preparedness; and operations/equipment.[2]

NEMSAC's original recommendation focused primarily on patient safety, or preventing adverse medical events. (Further details, rationale and references supporting the Council's recommendation can be found at http://ems.gov/pdf/nemsac/sep09/NEMSAC-OAR_Final_Report_092909.pdf.) The scope of the project was subsequently expanded to address EMS safety in a broader sense (to encompass patient safety, responder safety, and safety of members of the community EMS encounters in its work).

Responsibility for the content of this document rests with the American College of Emergency Physicians.

[2] http://ems.gov/pdf/nemsac/july08/Votes_Issues_July08.pdf

II. Project Timeline & Process Overview

The National EMS Culture of Safety Strategy project is structured as a three-year effort to allow for the direct involvement of the EMS community through participation of national EMS organizations as members of a Steering Committee for the project.

This is the fourth of five drafts of the Strategy. Development of the Strategy has been guided by the leadership of the Steering Committee and the project chair, Sabina Braithwaite, MD, MPH, FACEP. The Steering Committee provided detailed guidance to the project team through a combination of in-person and conference call meetings over the course of the project. Additional stakeholder input was gathered over the course of the project via public meetings and public comment on drafts.

- ✓ Steering Committee Meeting ..... April 2011
- ✓ National Stakeholder Conference ..... June 2011
- ✓ First Draft Delivered to NHTSA ..... Aug. 31, 2011
- ✓ Steering Committee Review ..... Sept./Oct. 2011
- ✓ Second Draft Available for Public Review ..... Dec. 12, 2011
- ✓ Collect Public Comment ..... until Feb 24, 2012
- ✓ Third Draft Available for Public Review ..... May 12, 2012
- ✓ National Review Meeting ..... June 19, 2012
- ✓ Fourth Draft Available for Steering Committee Review ..... Oct. 1, 2012
- ✓ NEMSAC Review Draft Complete ..... Dec. 10, 2012
- ✓ Collect NEMSAC Comments ..... Feb. 13, 2013
- ✓ Steering Committee Review Complete ..... Aug. 21, 2013

  Final Report/Project Complete ..... Sept. 23, 2013

The Steering Committee met in person in the Washington, D.C., area in April and June 2011, and again following the National Review Meeting in June 2012.

The Steering Committee was supported prior to and during the development of this Strategy by the Project Team. Support activities prior to the development of the first Draft included (but were not limited to):

- Interviews with industry thought leaders and safety experts
- Review of published literature, including findings presented by the NEMSAC Oversight, Analysis and Research Committee after a review of literature, state laws and related materials
- Review of background materials on cultures and how they change
- Review of materials presented at the National Stakeholder Conference
- Review of facilitated discussions, notes and recommendations from Conference participants

- Review of past EMS Agenda for the Future documents
- Review of discussions and recommendations by the Steering Committee
- Interviews with three authors of past Agenda documents about the processes they followed, what worked and what didn't
- In-depth discussions with physicians and pilots regarding how cultural change related to safety was facilitated within the healthcare and aviation industries.

Periodic conference calls with the complete Steering Committee have allowed the Project Team the opportunity to gather feedback and approval regarding the Strategy concept, outline and development of the first Draft. Guidance regarding the modification of the Strategy from the first to the second Draft was provided in a series of meetings between the project team and subcommittees within the full Steering Committee with specific committees focusing on individual elements of the Strategy. After public review and comment, the project team and Steering Committee again collaborated in a series of meetings to discuss and make decisions about changes to the Strategy, which changes were reflected in Draft 3. Changes reflected in Draft 4 were proposed, discussed and/or approved by the Steering Committee prior to presentation of the document to NEMSAC. Changes requested by NEMSAC were reviewed and incorporated into the Final Draft.

III. Public Input, Review & Comment

In recognition of the importance of input and support from a broad spectrum of stakeholders, the Strategy development process included several opportunities for Public comment:

National Stakeholder Meeting. A National Stakeholder Meeting was held in June 2011 in the Washington, D.C., area. The meeting was open to the public, and invitations were extended to the general EMS community as well as specifically invited individuals and stakeholder organizations, including Federal partners. Presentations included cultural change, safety culture and initiatives for responder safety and patient safety. Safety perspectives and example safety improvement initiatives were presented from outside EMS, in aviation, healthcare, construction, and firefighter life safety. Stakeholders broke into randomly chosen small groups to discuss specific issues and gather input on areas of common concern, for incorporation throughout the Strategy. Immediately following the public part of the meeting, the Steering Committee met to discuss next steps and priorities. The National Stakeholder Meeting agenda appears in Appendix VI of this document.

Public Comment on Drafts. The public review period for the document began Dec. 12, 211, with the release of the second Draft of the Strategy. That Draft was available for public comment until Feb. 24, 2012, when submitted comments were collected, reviewed and considered by the Steering Committee for the third Draft. The third Draft, released May 12, 2012, was available for public review and comment until June 19, 2012, at which point submitted comments were again considered via a similar process.

National Review Meeting. A National Review Meeting was held in the Washington, D.C., area on June 19, 2012. The meeting was open to the public, and invitations were extended to the general EMS community as well as specifically invited individuals and stakeholder organizations, including Federal partners. During the meeting comments were solicited about the document from the public and stakeholders. Specific feedback was sought about whether Draft 3 had achieved an appropriate balance among responder safety, patient safety and community safety. Additional input was sought about the diagram and primary elements of the Culture of Safety vision, as well as ideas for practical steps the EMS community can take to promote safety. The National Review Meeting agenda appears in Appendix VII of this document.

IV. Description of Safety-Related Articles & Materials Considered

The project team worked closely with NHTSA and EMSC to clarify that the literature component of this project should create a compendium of materials to include not only peer-reviewed articles, but periodicals, presentations, white papers and related materials that provided useful background information to the Steering Committee in advance of the development of the first draft of the document. Additional materials were incorporated into the reading list and shared with Project stakeholders throughout the development of the Strategy.

Due to the depth and breadth of the task of creating a national strategy to address such a significant topic, the reading list was organized into categories for consideration. These categories are:

- Safety Culture
- Crew Resource Management
- Risk
- Patient Safety
- Practitioner Safety/Occupational Injury
- Personal Health and Wellness
- Emergency Vehicle Safety

The Strategy's intent is to create momentum that will propel EMS toward success in improving responder safety and patient safety. Many of the factors considered and/or addressed in the Strategy have been discussed previously, and the envisioned elements may have been previously recommended in past efforts that did not focus on safety specifically. The intent of the Strategy is to build on work that has already been done, to the greatest degree appropriate, to enable the Strategy to function as a conduit to channel the expertise of both EMS stakeholders and other professionals toward the ultimate goal.

The *Emergency Medical Services Workforce Agenda for the Future* cited illness and injury among EMS workers as a major workforce concern and reported on research showing that the injury rate in EMS is high compared to other fields, with one study reporting an occupational fatality rate for EMS workers of more than twice the national average.[1]

A 2007 NHTSA-sponsored report, *Feasibility for an EMS Workforce Safety and Health Surveillance System*, offered rationale for a comprehensive program for surveillance of EMS illness and injury rates. The report recommended the creation of a National EMS Workforce Injury and Illness Surveillance Program (EMS-WIISP).

Other references to past works appear throughout this document.

V. Project Participants

Steering Committee

American Academy of Pediatrics
American Ambulance Association
American College of Emergency Physicians
American College of Surgeons – Committee on Trauma
Commission on Accreditation of Ambulance Services (CAAS)
Commission on Accreditation of Medical Transport Systems
Emergency Medical Services for Children, National Resource Center
Emergency Nurses Association
Governors Highway Safety Administration
International Association of EMS Chiefs
International Association of Fire Chiefs
International Association of Fire Fighters
International Association of Flight and Critical Care Paramedics
National Association of EMS Physicians
National Association of State EMS Officials
National Association of Emergency Medical Technicians
National EMS Management Association
National Volunteer Fire Council

Additional Involved Organizations

Advocates for EMS
Air and Surface Transport Nurses Association
Air Medical Journal
Air Medical Physicians Association
American Academy of Orthopedic Surgeons
American College of Osteopathic Emergency Physicians
American Hospital Association
American Society for Testing and Materials (ASTM F-30 EMS)
American Trauma Society
Association of Air Medical Services
Association of Critical Care Transport
Best Practices in Emergency Services
Committee on Accreditation of Educational Programs for the EMS Professions
Continuing Education Coordinating Board for EMS
Emergency Medical Services for Children-NRC
EMS Labor Alliance
EMS World
Federal Interagency Committee on Emergency Medical Services (FICEMS)
International Association for Healthcare Security and Safety
Institute of Medicine
Journal of Emergency Medical Services
National Academies of Emergency Dispatch

National Association for Search and Rescue
National Association of EMS Educators
National Collegiate EMS Foundation
National EMS Association
National EMS Pilots Association
National Fire Protection Association
National Native American EMS Association
National Organization of State Offices of Rural Health
National Registry of Emergency Medical Technicians
National Rural Health Association
National Safety Council
Society for Academic Emergency Medicine
The Joint Commission
Transportation Research Board of the National Academies, EMS Safety Subcommittee

Federal Agencies

National Highway Traffic Safety Administration (NHTSA)
Health Resources and Services Administration's (HRSA) EMS for Children (EMSC)
Occupational Safety and Health Administration (OSHA)
The National Institute for Occupational Safety and Health (NIOSH)
Department of Homeland Security – Office of Health Affairs (DHS-OHA)
Department of Health and Human Services – Assistant Secretary for Preparedness and Response (HHS-ASPR)
Centers for Disease Control and Prevention (CDC)
United States Fire Administration (USFA)

Project Team

American College of Emergency Physicians (Project Lead)
Sabina Braithwaite, MD, MPH, FACEP, Steering Committee Chair

Craig Manifold, DO, FACEP
Rick Murray, EMT-P
Pat Elmes, EMT-P (ret.)
Deb Fly

The RedFlash Group (Technical Writing and Development)
Jeff Lucia, EMT-P (ret.)
Keith Griffiths
Tricia Duva
Jake Knight
Deedee Coffey

VI. National Stakeholder Meeting Agenda

Monday, June 27, 2011 8:00 a.m. – 5:00 p.m.

8 – 8:45 a.m. Welcome and Introduction

Drew Dawson – Director, Office of EMS, NHTSA
Elizabeth Edgerton, MD, MPH, – EMSC and Injury Prevention Branch Chief, HRSA
Sabina Braithwaite, MD, MPH, FACEP – Steering Committee Chair, ACEP

Session 1

8:45 – 9:45 a.m. Just Culture: Engineering Better Outcomes for EMS

K. Scott Griffith, MS – Just Culture Community, Outcome Engineering

Mr. Griffith has more than two decades of experience at American Airlines - the world's largest airline - first as a pilot, then as the Managing Director of Corporate Safety and Quality Evaluations. He now works with airline, healthcare and EMS organizations to develop open, fair, and just cultures that are supportive of system safety by facilitating open communication within the organization, while working within a system of accountability that supports safe behavioral choices among staff.

9:45 – 10:45 a.m. Breakout Discussion

10:45 - 11 a.m. Break

Session 2

11 – 11:30 a.m. Cultural Change – Lessons from the Institute for Healthcare Improvement

David M. Williams, PhD – Principal and Chief Improvement Officer, Positive Eye Consulting

A former urban street paramedic, Dr. Williams has acted as an internal and external improvement advisor to governmental agencies, hospitals, and for-profit and not-for-profit organizations. He is a faculty member of the Institute for Healthcare Improvement (IHI) and is an IHI improvement advisor. He is also on the teaching faculty of The George Washington University School of Medicine and Health Sciences.

11:30 – 12:15 p.m. Breakout Discussion

12:15 – 1:15 p.m. Lunch (on your own)

Session 3

1:15 – 2:15 p.m. The Intersection of EMS Safety and Patient Safety

Daniel Patterson, PhD, MPH, EMT-B and Blair Bigham, MSc, ACPf

Dr. Patterson's efforts to improve quality, safety and performance in emergency medical care are featured in his most recently published article, *Variations in Emergency Medical Services Workplace Safety Culture*. He is a Prehospital Emergency Care Assistant Professor at the University of Pittsburgh School of Medicine and is Director for Research at the Center for Emergency Medicine of Western PA.

Mr. Bigham is an advanced care flight paramedic in Southern Ontario, Canada. He is an investigator at Rescu, the resuscitation science program at the University of Toronto and St. Michael's Hospital, and holds a faculty position at Centennial College. He was the lead author for the recent paper, *Patient Safety in Emergency Medical Services – Advancing and Aligning the Culture of Patient Safety in EMS.*

2:15 – 3:15 p.m. Breakout Discussion

3:15 – 3:30 p.m. *Break*

Session 4

3:30 – 4 p.m. **Building a Culture of Safety From the Ground Up: Insight from the Construction and Healthcare Industries**

Michael Szczygiel, Senior Loss Control Representative, THOMCO - Medical Transportation Division

A paramedic, and faculty member of the Emergency Medical Training Program at the University of Kansas School of Medicine College of Health Sciences, Mr. Szczygiel approved all paramedic training in Kansas and wrote and administered the State paramedic certification exam. After more than 20 years in EMS, he became Director of Risk Management for a tertiary care center, community hospital and a psychiatric hospital. He is a member of the NAEMT Health & Safety Committee, and he helped develop and teach the NAEMT Safety Course. Additionally, Szczygiel serves as Director of Safety, on an ad hoc basis, for Central States Contracting Services, a Mechanical & General Contractor.

4 – 4:45 p.m. **Breakout Discussion**

4:45 p.m. **Reconvene**
Discuss Day Two – Sabina Braithwaite, MD, MPH, FACEP, Steering Committee Chair, ACEP

5 p.m. *Conference Day 1 Complete*

Dinner (on your own)

Tuesday, June 28 8:00 a.m. – noon

8 - 8:15 a.m. **Putting It All Together**

Sabina Braithwaite, MD, MPH, FACEP – Steering Committee Chair, ACEP

8:15 – 8:45 a.m. Case Study – Firefighter Life Safety Initiatives; Everyone Goes Home

Chief Ronald J. Siarnicki, Executive Director, National Fallen Firefighters Foundation

Chief Siarnicki is the executive director of the National Fallen Firefighters Foundation- a nonprofit organization that was established by the United States Congress to honor and remember America's fallen fire heroes and to provide re-sources to assist survivors in the rebuilding of their lives. He oversees the Foundation's programs, services, and activities, including the National Fallen Firefighters Memorial Weekend, survivor support programs, fire service training and support programs, and the expansion of the official national memorial site to create a national memorial park.

8:45 – 10:15 a.m. **Breakout Discussion**

10:15 - 10:30 a.m. *Break*

10:30 – 11:45 a.m. **Full Group Discussion**

11:45 a.m. **Conference Wrap-Up**

Sabina Braithwaite, MD, MPH, FACEP – Steering Committee Chair, ACEP
Elizabeth Edgerton, MD, MPH, - EMSC and Injury Prevention Branch Chief, HRSA
Drew Dawson – Director, Office of EMS, NHTSA

EMS Culture of Safety Strategy
National Review Team Meeting

Sheraton National, Arlington, VA
June 19, 2012
8:30 AM-4:30 PM

8:30 AM Welcome, Housekeeping and Introductions

8:45 AM Where We Have Been and Future Direction

9:00 AM Creating a Culture of Safety – Are we headed in the right direction?

Purpose: *To solicit broad comments about the document, to get the audience talking, to allow folks an opportunity to "say their piece" and to provide positive suggestions for improvement (Philosophical discussion).*

10:00 AM Break

10:15 AM Right balance – EMS Personnel, Patient and safety of the public?

Purpose: *One of the challenges Culture of Safety is creating a pervasive culture – one that touches the personnel, the patient and the public. This section will elicit feedback on whether we have established the correct balance.*

10:45 AM EMS Culture and Safety – What do you think?

Purpose: *To solicit feedback on the "Culture and Safety" component of the document.*

11:45 AM Summary of morning discussion and introduce afternoon session

12:00 PM Lunch

1:00 PM Suggested elements –Will this move us forward??

Purpose: *Focus specific comments on the diagram and each of the elements.*

a. *Discuss diagram*
b. *Data System*
c. *Education Initiatives*
d. *Standards*
e. *Reporting and Investigations*
f. *Other issues?*

3:00 PM Afternoon break

3:15 PM	Next steps – What can the EMS community do collectively to promote a Culture of Safety? ***Purpose:*** *This session is to identify specific action steps that the EMS community could take right now to implement the Culture of Safety. This is not necessarily Federal action, but activities of local, state and national organizations.* ***(Note:*** *need to be careful that we are not attempting to arrive at consensus)*
4:00 PM	Wrap up and project next steps
4:30 PM	Adjourn

VIII. NEMSAC OAR Report: Reducing Adverse Events in EMS: Creating a Culture of Safety

NOTE: THIS REPORT HAS BEEN OMITTED FROM THIS DOCUMENT TO LIMIT FILE SIZE AND PRINTING EXPENSE. THE REPORT IS AVAILABLE IN PDF FORMAT AT THE FOLLOWING LINK.

http://ems.gov/pdf/nemsac/sep09/NEMSAC-OAR_Final_Report_092909.pdf

National EMS Advisory Council
Committee Reporting Template
June 2, 2009
FINAL

Committee: Safety
Title: EMS Injury and Safety Data

ISSUE SYNOPSIS:

A. PROBLEM STATEMENT

Emergency Medical Services (EMS) has been identified as a high risk industry with injuries and deaths among both service providers and the public. The current lack of a comprehensive EMS injury data system, capable of collecting, cataloging and reporting standardized EMS crash and non-crash related injury data, severely limits the industry's ability to develop, test and implement mitigation strategies. The task of identifying injury causative factors becomes far too speculative without timely, accurate, complete, integrated and accessible data that includes location, cause, contributing factors, and related activities associated with injuries involving EMS personnel. This report does not focus on medical errors.

B. RESOURCES/REFERENCES RELATED TO THE ISSUE

- Model Minimum Uniform Crash Criteria: DOT HS 810 957 June 2008
- American National Standard Institute (ANSI) D16.1 Manual on Classification of Motor Vehicle Traffic Accidents, Seventh Edition
- American National Standard Institute (ANSI) D20-1 Data Element Dictionary on for Traffic Records Systems
- Feasibility for an EMS Workforce Safety and Health Surveillance System, NHTSA
- Bureau of Labor Statistics Injury Data
- Study of Emergency Vehicle Warning Lighting, (July 2005) USFA
- Emergency Vehicle Visibility and Conspicuity Study, USFA

Additionally, there are three projects in progress that may provide insight to this topic. They are:

- NIOSH - National Electronic Injury Surveillance System (NEISS) project
- NIOSH – Project on interior design issues of ambulances.
- NFPA – the development of standard on ambulance design.

C. CROSSWALK WITH OTHER STANDARDS

- National Emergency Medical Services Information System (NEMSIS): NHTSA Version 2.2.1

D. ANALYSIS

Emergency Medical Technicians and Paramedics are routinely exposed to factors that threaten personal as well as patient safety.

The public, government, and EMS industry have a duty to identify these threats, find ways to remove and reduce their impact, and develop a culture of safety in EMS, as espoused by the National EMS Advisory Council.

There are limited sources of existing data that identify threats to personnel and patient safety. Non-vehicle/crash related injuries are by far the most numerous and their cost to the industry and society is staggering. Non-vehicle/crash injuries also present the biggest challenge for researchers as there are few established data definitions and repositories for the collection and analysis of these types of incidents.

In contrast there are several federally sponsored data capture and analysis systems which can be use to obtain EMS transport incidents. The most prominent systems are directed by the National Highway Traffic Safety Administration (NHTSA), Federal Highway Administration (FHWA), Federal Motor Carrier Safety Administration (FMCSA), and the National EMS Information System (NEMSIS).

The data collected by most of these systems originate from traffic crash data recorded by local law enforcement agencies responding to highway crashes. Police Accident Reports (PAR) are completed on scene then uploaded into local and/or State maintained data bases. State crash information is then uploaded into national data collection and analysis systems.

Data definitions used to input information into State crash files is published in the

DOT report "Model Minimum Uniform Crash Criteria (MMUCC)" and the American National Standard Institute (ANSI) D16.1 "Manual on Classification of Motor Vehicle Traffic Accidents", Seventh Edition. State PAR definitions are reported to be 75% compliant with the standards contained in MMUCC and ANSI D16.1.

The examination of data definitions and elements captured by States indicates a wide range of interpretation related to EMS programs. For example, a search of ANSI D16.1-2007 reveals no references to "ambulance vehicles" or to "fire trucks". The MMUCC definition for "ambulance" is now defined as, "any public of private ambulance service under contract to a jurisdiction to provide emergency response for medical emergencies." A fire truck is now included in the general definition of an emergency motor vehicle, "Indicates operation of any motor vehicle that is legally authorized by a government authority to respond to emergencies with or without use of emergency warning equipment, such as police vehicle, fire truck, or ambulance while actually engaged in such response." Collecting data using dissimilar definitions for EMS is problematic and often results in inaccurate reporting.

There are also other initiatives on the non-governmental side that are capturing data on incidents. The National Fire Fighter Near-Miss Reporting System is a voluntary, confidential, non-punitive and secure reporting system with the goal of improving fire fighter safety. The data collection allows for an EMS provider, regardless of agency type, to report near misses in the collection system. You can find additional information at: http://www.firefighternearmiss.com/. EMSCloseCalls.com is operated by an individual and offers a similar format for personnel to upload information as a result of a close call. CONCERN network is a reporting database system for air medical services to report incidents.

The most blatant limitation with these sources of data is heterogeneity in terminology. For example data definitions used to track vehicle crash and their resulting injuries, fail to identify EMS-specific terms such as: What is an ambulance? What is an EMS System? What constitutes an EMS call? What differentiates a run, trip, call, response, incident, and/or dispatch?

Similar disparities in data collection can be noted when comparing data definitions used to capture information on transportation injuries as vehicles used for EMS purposes are, in some cases, exempted from FMCSA safety oversight. The analysis of EMS injury data is an important step in the process of reducing the rate of crash and non-crash related injuries and fatalities among EMS workers, their patients and the general public. Current data capture systems fail to capture the important elements of injuries and the associated denominator data such as miles traveled, vehicle miles, scheduled work hours, hours on duty, and hours responding to calls. This information is an important foundation for any project designed for the purpose of reducing risks and improving the general culture of safety within the industry.

E. COMMITTEE CONCLUSION

An essential element in creating a culture of safety is establishing a baseline of known hazards and injuries. Existing federal and non-federal systems for measuring worker, patient, and public injuries and fatalities fall short of meeting the needs of the industry.

RECOMMENDED ACTIONS/STRATEGIES:

National EMS Advisory Council

The Safety Committee recommends the establishment of a standing sub-committee on "EMS Safety Data" to pursue the future development of information processing system(s), process or services capable of providing the analytical tools needed for the mitigation of illnesses, injuries, and deaths to EMS providers, patients, and public.

National Highway Traffic Safety Administration

The National EMS Advisory Council recommends a NHTSA review of current data definitions relating to EMS illnesses, injuries and deaths, to include definitions contained in MMUCC, ANSI D 16.1, and any other database system recording EMS illnesses, injuries, and deaths.

The National EMS Advisory Council recommends NHTSA to encourage and develop relationships between federal and non-federal partners utilizing existing reporting systems to improve consistency of terminology and access to data sources on EMS illnesses, injuries, and deaths. (i.e. IAFC Near Miss reporting system, Bureau of Labor Statistics, National Transportation Safety Board)

Other Department of Transportation
None

Federal Interagency Committee on Emergency Medical Services
The National EMS Advisory Council recommends NHTSA work with FICEMS to assure integration and utilization of EMS illnesses, injury, and fatality surveillance databases across federal agencies.

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