



EMERGENCY MEDICAL SERVICES IN RURAL AMERICA



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“The emergency health care system is incredibly fragile in the United States, and it wouldn’t take much of a catastrophic event to push it over the edge... Because of that fragile nature, we are really in danger of not being able to provide the level and quality of care that our constituents—meaning our neighbors and friends—have come to expect and deserve.”

— Nels Sanddal, President, Critical Illness and Trauma Foundation, Montana
NCSL Rural Health Pre-Conference, April 2007

NCSL convened a day-long conference in April 2007 to inform policymakers about the challenges facing emergency medical service providers in rural America. The meeting brought together experts from around the country who presented promising state strategies and highlighted ways that states are strengthening the EMS “system”—the people delivering care, the resources that help providers deliver care effectively and efficiently, and the partnerships among caregivers and facilities that help to fill gaps in services. This report summarizes the conference and highlights important information covered in the following areas.

- I. *The Context: Challenges to the Rural EMS System.* This section defines EMS and rural trauma, describes differences in health outcomes among rural and urban residents, outlines the importance of integrating EMS into the broader health care system, and highlights the key challenges to maintaining an effective system of care.
- II. *Moving Forward: Strategies for Improving Rural EMS.* This section presents strategies and tools for creating a more sustainable system through changes in the following areas:
 - Sustaining the EMS Workforce through Recruitment and Retention,
 - Financing and Reimbursing EMS Systems, and
 - Developing Rural Trauma Systems.

Conference Faculty

- **Tom Morris**, Deputy Director, HRSA Office of Rural Health Policy, Maryland
- **Daniel Patterson**, Ph.D., MPH, EMT-B, Research Associate, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill
- **Michael Rotondo**, M.D., F.A.C.S., Professor and Chairman, Chief of Trauma and Surgical Critical Care, Department of Surgery, Brody School of Medicine, East Carolina University
- **Nels Sanddal**, M.S., President, Critical Illness and Trauma Foundation, Montana
- **Chris Tilden**, Ph.D., Director, Kansas Office of Local and Rural Health
- **Gary Wingrove**, Manager, Mayo Clinic Medical Transport, Minnesota

I. The Context: Challenges to the Rural EMS System

EMS Defined

“EMS encompasses the initial stages of the emergency care continuum. It includes emergency calls to 9-1-1; dispatch of emergency personnel to the scene of an illness or trauma; and triage, treatment, and transport of patients by ambulance and air medical service. The speed and quality of emergency medical services are critical factors in a patient’s ultimate outcome.”

Source: National Academy of Sciences, *Emergency Medical Services: At the Crossroads* (Washington D.C.: The National Academies Press, 2007).

Trauma is the silent killer in America’s rural and frontier areas. Rural Americans suffer a disproportionate number of deaths from trauma despite a decreasing population density in many rural areas. Speakers outlined the effects of trauma on rural residents and described how the current EMS system is ill-equipped to meet the needs of rural residents.

Snapshot of Rural Injury

Compared to their urban counterparts, rural Americans experience a disproportionate share of injury-related deaths. Although only 20 percent of the nation’s population live in rural areas, Rotondo said that nearly 60 percent of all trauma

deaths occur in rural areas. Moreover, the death rate in rural areas is inversely related to the population density. Consider these facts about rural injury.

- The relative risk of a rural victim dying in a motor vehicle crash is 15 times higher than in urban areas, after adjusting for crash characteristics, age and gender.
- Injury-related deaths are 40 percent higher in rural communities than in urban areas.
- Eighty-seven percent of rural pediatric trauma deaths did not survive to reach the hospital.

The other part of the equation is timing. Rural residents simply do not have the advantage of swift transport to a trauma center. Nearly 85 percent of U.S. residents can reach a level one or level two trauma center within an hour, but only 24 percent of residents in rural areas have access within that time frame. “Trauma patients need to receive care quickly—we always (say) that injured patients are supposed to be at the trauma center within one hour,” Rotondo said, “because the normal physiology, their normal ability to compensate for the injury, really lasts about an hour in the best of circumstances.” Patients who can not be transported quickly to a trauma center have higher complication rates of pneumonia, sepsis and renal failure. That first hour is crucial, because this is when the patients still have the “reserve,”—or a person’s innate ability to cope with trauma—and when providers have the best chance of saving a life.

II. Moving Forward: Strategies for Improving Rural EMS

“Time is critical. One’s ability to intervene, stop the bleeding and resuscitate the patient is the key to their living or dying.”

—Michael Rotondo, Brody School of Medicine, East Carolina University

Despite the challenges facing rural America, rural communities across the country are finding ways to improve the pre-hospital care process for patients and increase the chances that patients will arrive at a care facility alive and in stable condition. Chris Tilden summarized three critical areas of focus for policymaker efforts: the “Three Rs”— recruitment and retention, reimbursement, and restructuring of the EMS system. Each of the three areas was addressed during the conference, and they are explained in further detail in the following sections.

Sustaining the EMS Workforce Through Recruitment and Retention

“Surveys of state EMS directors have consistently shown recruitment and retention of personnel to be the greatest barrier to the successful provision of ruralf frontier EMS.”

—Nels Sanddal, Critical Illness and Trauma Foundation

The Problem

Recruiting and retaining a qualified EMS workforce is an uphill battle, with increased demand for services (driven by an aging population) on the one hand and an insufficient workforce on the other. Not only are rural areas scrambling to find personnel, they are also struggling with a workforce that often does not have the necessary skills to appropriately treat patients who have complex and life-threatening medical needs.

According to Tilden, the most vexing recruitment and retention problems include rural areas’ reliance on a volunteer-based system, a shortage of EMS leadership expertise, and lack of integration of EMS personnel into the health care system. According to Tilden, there is little overlap between the EMS and health care systems. EMS providers receive their training apart from other health care providers, and as a result, there is not an interdisciplinary team approach to trauma care among EMS and health care providers. An integrated approach—where EMS providers receive training and education with other health care providers, and have opportunities to network and share best practices—will not only benefit recruitment and retention efforts, but will also expand the skill set among EMS workers.

Although the reliance on an unpaid workforce yields cost savings for rural areas, these areas also experience problems maintaining around-the-clock coverage, since many of the volunteers have other jobs and are not available on a “24/7” basis. These other commitments also make it difficult for some people to keep up with their training requirements.

Tilden describes a workforce shortage that spans the entire continuum of EMS providers. “There is a systematic shortage of leadership expertise in EMS,” Tilden said. In addition to struggling to find qualified medical doctors to fill key positions—many rural EMS units do not have a physician acting as a medical director. Physicians acting as medical directors are important because they provide medical oversight to EMS personnel. Patterson found that EMS providers are not completely satisfied with their medical directors. More than 70

percent of state EMS directors report that they want more from their medical directors, such as helping to provide continuing education, developing quality improvement programs, and offering support for decisions made in the field. Patterson says that "...medical directors are a key ingredient in workforce sustainability."

What's Needed

Almost 80 percent of EMS personnel in rural areas are reported to be volunteers, Sanddal said, compared to 33 percent in more urban settings. "Ultimately the system we have based on volunteers is going to be a system that is not sustainable," Tilden said. Rural EMS agencies are struggling to recruit volunteers, Sanddal said, given the high-stress around-the-clock job requirements. Moreover, demographic changes are depleting the pool of young workers, as many rural communities are growing older (which increases demand for services, while reducing the pool of potential volunteers). Add to that, the demands on EMS workers are exceeding reality, Sanddal said. "We are seeing that the expectations of rural residents relative to the timeliness and quality of care and levels of response...don't always match the realities of the volunteer workforce and system. Tilden and Sanddal agree that it is important to develop systems that have both volunteers and paid staff to ensure sustainability. Tilden discussed the current recruitment and retention situation, and where he believes we want to be to strengthen the EMS workforce (Table 1)

Table 1. Strengthening Recruitment and Retention in Rural EMS

Three Rs	Where We Are	Where We Want to Be
Recruitment/Retention	<ul style="list-style-type: none"> • Volunteer-based system (shrinking workforce) • Systematic "shortage" of leadership expertise • Training programs and "acculturation" that do not encourage integration of EMS with the health care system 	<ul style="list-style-type: none"> • Paid and volunteer EMS staff with broad "community health" skill. • Well-trained managers and medical directors. • Team training and other opportunities for "interdisciplinary" team work.

Source: Tilden's presentation, NCSL Rural EMS meeting, April 2007.

EMS providers want to provide the highest level of care for their community, said Sanddal, and with the proper support, they will receive the necessary training and education. "If you give that person the resources, they will very likely do it and provide the care at the proper level," Rotondo said. "It's a matter of setting standards for those people, and then giving them the resources that they need to accomplish it."

Sanddal also argues that federal rural health recruitment and retention efforts should include EMS in order to more closely integrate it within the health care system. Achieving a more cohesive system, many speakers argued, will benefit EMS workers through improved training opportunities, increased access to health care providers and facilities (easing the isolation many rural providers experience), and enhanced communication among providers. "We need to more closely integrate EMS into the health care discipline," Tilden argued, "from the very beginning—when they start this training process."

Solutions and Strategies

Several states and communities have developed promising strategies to recruit and retain a well-trained EMS workforce. Some examples follow.

- *Retain Personnel.* The Virginia Office of Emergency Medical Services operates a “Keeping the Best!” campaign that develops strategies for retaining EMS personnel and provides a workforce retention tool kit for EMS leaders.
- *Offer Financial Incentives to Help Attract and Retain Personnel.* Wingrove suggests that states could extend certain benefits to EMS workers, such as death benefits that typically are reserved for public safety officers, access to state retirement systems, and loan repayment programs.
- *Remove Financial Barriers.* Oregon helps certain rural providers purchase malpractice insurance to remove a financial barrier to practicing in rural areas. According to an Oregon state Senator in attendance, “It’s been very successful in keeping physicians in the rural area, particularly those who deliver babies.”
- *Expand Role of EMS Providers to Fill Gaps in Care.* Some states are using community paramedics in non-ambulance situations. They may help fill gaps by working in emergency rooms or help improve access to preventive services by assisting with public health functions such as immunization campaigns and ear safety checks. In a number of territories in Australia and Canada, paramedics are used extensively to meet the primary health care needs of remote communities that have limited or no access to local physicians. This has multiple advantages for the local community: It decreases unnecessary transports to hospitals (by treating less serious issues locally); reduces the burden of travel for patients; and maximizes the provider's role in the community.

Pennsylvania Governor Rendell unveiled Prescription for Pennsylvania, which will enhance access to “...the right kind of health care, from the right provider, at the right time, in the right place, for the right cost,” according to the plan’s website. According to Wingrove, the reform plan will eliminate barriers that limit the ability of nurses, advanced nurse practitioners, midwives, physician assistants, pharmacists, dental hygienists and other licensed health care providers to practice to the fullest extent of their training and skills.

- *Enhance Training Opportunities Through Technology.* With grants from the federal Office of Rural Health Policy and the Maternal and Child Health Bureau, Montana established a virtual EMS community. The program equipped rural EMS units with multi-media computers to facilitate training and foster communication among providers statewide. Not only does technology facilitate training opportunities, it also has the added benefit of bringing providers together to share data and discuss best practices and, at the same time, creates a sense of community for EMS workers and decreases feelings of isolation.

Financing and Reimbursing EMS Systems

The Problem

Rural EMS has the dual problem of low volume and high fixed costs. The costs to maintain an ambulance service or a billing system, for example, are no less the volume of transports or billing transactions is lower than in an urban areas. “The fixed costs of being an ambulance service don’t go away whether you’re sitting in the bay or on a run,” according to Tilden. However, rural EMS units are reimbursed based on transport volume. In the pre-hospital system, Tilden says that “...transportation-based payment is the name of the game.” In addition, ambulance services in many states are struggling with Medicare reimbursement reductions, according to Wingrove, which “...do not reflect reasonable cost or charges.”

What’s Needed

“Given the low volume of services in rural America,” Tilden said, “it’s important for us to think about how we can move away from a transport-based model to one based on a preparedness.” Tilden and Wingrove recommend using a community’s available human resources to the maximum extent possible—beyond transporting patients, for example—in a broader public health role. “I’d encourage you not to box ambulance people into their ambulance,” Wingrove argued, and instead begin to envision an EMS worker with added responsibilities, such as public health, disease management and mental health. Table 2 presents Tilden’s ideas for strengthening reimbursement for EMS providers.

Table 2. Enhancing Reimbursement for EMS Providers

Three Rs	Where We Are	Where We Want to Be
Reimbursement	<ul style="list-style-type: none"> • Transport-based system • Limited local capacity to operate billing systems and other business operations • Lack of access to capital 	<ul style="list-style-type: none"> • Preparedness-based payment (including non-transport). • Enhanced capacity for business operations through education, community awareness, and networking and regionalization.

Source: Tilden’s presentation, NCSL Rural EMS meeting, April 2007.

Solutions and Strategies

To accomplish this, Tilden explained, requires that EMS providers use human and capital resources to the fullest extent in order to maximize a region’s equipment, administrative systems, workers and facilities—and, in doing so, seek to capture savings and increased reimbursement to help finance the EMS system. Several speakers presented the following specific strategies to help meet these goals.

- Find ways to use providers to deliver preventive care, provide public health services or work in emergency rooms. Currently, no mechanism exists for reimbursement; therefore, no incentive exists to use these providers most effectively and provide reimbursement for their services
- Enhance capacity for business operations through regionalization or consolidation of administrative services.
- Enhance community awareness. Rural residents' perceptions about their local emergency services do not always match reality, Tilden said. "They assume that a paramedic will show up at their door in five minutes, when, in truth, it might be a volunteer who can provide only the most basic of emergency care services and who will show up in 25 minutes." Therefore, Tilden believes it's important that people understand "...what the system looks like, what it costs to run those systems so that they can make informed decisions about the type of investment they want to make in their systems."
- Enhance access to capital. Although equipment and technology are costly, they are critical to improve quality. EMS leaders need to participate in federal and state dialogue and planning for health information technology.

In addition, Wingrove suggested that states consider including ambulance services in their revenue recapture programs, to direct certain state funds—income tax refunds or lottery payments, for example—to pay unpaid ambulance bills. He also recommended that states dedicate a portion of their federal homeland security and bioterrorism funds to EMS.

Developing Rural Trauma Systems

"A key objective of any EMS system is to ensure that each patient is directed to the most appropriate setting based on his or her condition. Coordination of the regional flow of patients is an essential tool in ensuring the quality of prehospital care, and also plays an important role in addressing systemwide issues related to hospital and trauma center crowding."

—"EMS: At the Crossroads," National Academy of Sciences

It is clear that a disparity exists in mortality and health outcomes for rural Americans. "If you develop your trauma system," Rotondo explained, "overall survival will improve, motor vehicle crash survival will improve, geriatric survival will improve, remote rural survival will improve, and, finally, the process of care will improve overall."

The Problem

The current system, Tilden argues, is characterized by "functional silos and a lot of turf." The rural EMS system is strained by many factors—including reliance on a largely volunteer workforce, gaps in workforce skills and inadequate reimbursement—and is inconsistent from one rural area to the next. According to the 2007 report, *Emergency Medical Services: At the Crossroads*, EMS systems have developed "haphazardly" across the country and, as a result, "...there is now enormous variability in the design of EMS systems among states and local areas."¹ According to the report, the current EMS system is challenged by many factors, summarized in Table 3.

Table 3. Challenges to the Current EMS System

Insufficient coordination	EMS care is fragmented; multiple EMS agencies in the same jurisdiction do not respond cohesively. Among the areas where coordination is poor: coordinating transport; managing the regional flow of patients to the optimal facility; and communications and transfer of patients between EMS and hospital personnel.
Disparities in response times	Geography explains some of the differences, but response times also are adversely affected by the organization and management of the EMS system and by the communication and coordination between the 9-1-1 dispatch and EMS responders.
Uncertain quality of care	There are no national quality measures for EMS and “virtually no accountability for the performance of EMS systems.” As a result, there is a lack of information about quality of care delivered by EMS.
Lack of readiness for disasters	“Although EMS personnel are the first to respond in the event of a disaster, they are the least prepared component of community response teams.” EMS personnel have not received significant federal funding for disaster preparedness, and EMS is not well represented in federal disaster planning.
Divided professional identity	“EMS is a unique profession, one that straddles both medical care and public safety.” EMS personnel lack the respect of other health care providers or public safety officers, and they often are paid less than comparable occupations.
Limited evidence base	There is a lack of research about pre-hospital care, and as a result, “the evidence base for many practices routinely used in EMS is limited.”

Source: National Academy of Sciences, *Emergency Medical Services: At the Crossroads*, 2007.

What's Needed

Moving forward, Tilden says, policymakers must “preserve what’s right in the system,” while developing a “system approach that will support those folks who are out there providing care on the frontline.” Table 4 provides Tilden’s summary of the current status of EMS systems and where we want to be in the future.

Table 4. Strengthening EMS Systems Through Restructuring

Three Rs	Where We Are	Where We Want to Be
Restructuring	<ul style="list-style-type: none"> • Functional and organizational silos and turf • Lack of shared data • Focus on regulatory compliance, not “quality” 	<ul style="list-style-type: none"> • Functional regionalization and new care models • EMS integration into regional health exchange • System-level analysis and accountability

Source: Tilden’s presentation, NCSL Rural EMS meeting, April 2007.

To attain these goals, then, requires sharing of information, accountability and quality, and new care models that are characterized by coordination among providers and networks of care. Some believe that a formal lead agency for EMS would help to integrate EMS into the health care system at the federal level, and help to foster collaboration between EMS providers and medical providers and foster a regionalized and accountable emergency care system.

Solutions and Strategies

There are some promising examples of states and communities that are attempting to restructure EMS into a cohesive and organized system. The 2006 Institute of Medicine's report, *The Future of Emergency Care in the United States Health System*, recommended that EMS systems move from a fragmented system to one that is "coordinated, regionalized and accountable." A coordinated system is characterized by effective communication among the various EMS providers, from the 9-1-1 dispatch to the emergency department surgeon.

- ***Develop Cohesive and Integrated Systems.*** In Hawaii, the state Emergency Medical Services and Injury Prevention system seeks to reduce deaths and injuries through a "fully integrated cohesive network of related components." The state system is responsible for arranging personnel, facilities and equipment in the pre-hospital setting. The system includes injury prevention and public education within the EMS system and combines data collection from EMS injuries, highway safety and hospital discharge to help communities develop injury prevention programs.²

The Kansas Office of Local and Rural Health's trauma program manages pre-hospital data collection for the state to help policymakers understand the problems and identify solutions.

- ***Institutional-Level Changes.*** Rotondo describes the steps taken at his hospital to develop a "culture of trauma." The hospital invested in developing a trauma center and hiring qualified providers and faculty. It also developed practice management guidelines. As a result, death rates dropped for all patients, and the improvements were most pronounced for children. "We were able, in a short amount of time, to drive this death rate down because the hospital decided to invest in bringing in experts to try to take care of these people," he says.

Conclusion

Although many threats exist to the stability of emergency medical services in rural America, speakers agree that investing resources in the development of a cohesive and organized system will reap rewards in terms of better health outcomes and a more financially viable system. According to Rotondo, for states that invest in trauma systems, it becomes a quality of life decision. “Like good water and great schools and healthy environments, emergency medical services and trauma systems are a quality of life issue.”

Notes

1. Institute of Medicine of the National Academies, *Emergency Medical Services: At the Crossroads* (Washington, D.C.: The National Academies Press, 2007).
2. Hawaii State Department of Health, State Emergency Medical Services and Injury Prevention, <http://www.hawaii.gov/health/family-child-health/ems/index.html>, June, 2007.

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