
ACCESS TO QUALITY HEALTH SERVICES IN RURAL AREAS— EMERGENCY MEDICAL SERVICES

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SCOPE OF PROBLEM

- Access to emergency medical services (EMS) was identified as a major rural health concern among state offices of rural health.³¹
- Emergency medical services are a major factor in assuring “access to health care,” one of the 10 “leading health indicators” selected through a process led by interagency workgroup within the U.S. Department of Health and Human Services.³²

GOALS AND OBJECTIVES

One Healthy People 2010 goal is to improve access to comprehensive, high quality health care services.¹ According to the Rural Healthy People 2010 (RHP2010) survey, access to quality health services (which includes emergency medical services) was ranked as the top rural health priority. In a preliminary survey of state and national rural experts conducted by RHP2010, emergency medical response was frequently named specifically as a major rural health problem.²

The following Healthy People 2010¹ objectives are among those addressed in the discussion of emergency medical services:

- 1-10. Reduce the proportion of persons who delay or have difficulty in getting emergency medical care.
- 1-11. Increase the proportion of persons who have access to rapidly responding pre-hospital emergency services.
- 1-13. Increase the number of Tribes, States, and the District of Columbia with trauma care systems that maximize survival and functional outcomes of trauma patients and help prevent injuries from occurring.

- 1-14. Increase the number of States and the District of Columbia that have implemented guidelines for pre-hospital and hospital pediatric care.

Emergency medical services is the umbrella term for a continuum of health services including pre-hospital medical services, emergency services provided at the hospital or health center, and the trauma system that often serves as the network of coordinated trauma care.

Due to a variety of factors including availability of professional and paraprofessional service providers, geographic barriers, and resource constraints, there is a wide disparity in emergency medical services between rural and urban areas.³⁻⁵ The shortage of qualified medical professionals and other essential personnel, accompanied by a lack of other resources, poses great challenges for the provision of adequate care and treatment to patients following initial stabilization.⁶

PREVALENCE

Emergency medical services are the vital extension of emergency care from the community to the hospital emergency room. Injuries in rural areas tend to be greater in severity than those in urban areas.⁴ Only one-third of all motor vehicle accidents occur in rural areas, yet two-thirds of the deaths attributed to these accidents occur on rural roads.⁷

Trauma patients in rural areas who have a greater likelihood of needing advanced care are less likely to receive it.

Volunteers constitute up to 90 percent of emergency medical service teams in rural frontier areas,⁴ and

many of these areas depend on basic emergency medical technicians (EMTs). Therefore, trauma patients in rural areas who have a greater likelihood of needing advanced care are less likely to receive it.

Hospital emergency departments in rural areas encounter many challenges. Chief among these is staffing. Many of the emergency room directors are not specialists in emergency medicine, and for those who are specialized, the low volume of patients creates an environment not conducive to maintaining those skills.^{4,8} Providing 24-hour availability of emergency room staff is also a problem; often nurses are relied on until the physician arrives.⁹ Financial constraints also exist for these facilities serving a small population, making it difficult for them to offer needed trauma services.⁴

Trauma systems primarily function as a statewide system, pulling together multiple health-care components in an effort to ensure timely response and transport times of injured patients to facilities that, when patients are received, will provide adequate resources and personnel for their treatment.¹⁰ Studies have been conducted that support the positive effect of these systems for urban areas, with the effect on rural areas now also being discovered.¹¹

Children account for 25 percent of injury victims, approximately 10 percent of emergency response transports, and one-third of emergency department visits.^{12,13} For those from age six through 18 in rural areas, vehicular injury is the most common reason for calls made to EMS.¹³ One rural study points to motor vehicle crashes along with falls and recreational activities accounting for over one-half of all pediatric injuries.¹⁴

IMPACT

The timeliness of EMS response is critical to the survival of the patient. The majority of deaths occurring from trauma incidents in rural areas may occur at the scene, rather than in the admitting hospital. One study found that 72 percent of trauma deaths in a rural county occurred at the scene,

proving the critical nature of the first hour following the actual incident.¹⁵ The ‘golden hour’ refers to this first hour from incident to hospital treatment during which, if treatment is received, the patient’s likelihood of survival is greatly increased.¹⁶ One study supports this in reporting a seven times higher likelihood of death for those victims who waited longer than 30 minutes for EMS response.¹⁷ National average response times from motor vehicle accident to EMS arrival in rural areas was 18 minutes, eight minutes greater than in urban areas.¹⁸

The effectiveness of trauma systems on mortality rates in rural areas has yet to be clearly determined.

Many studies compare those patients who were stabilized in an outlying hospital before being transferred to a higher-level facility to those who were directly admitted to the latter facility. One such study found no difference in the mortality rates between those two types of patients. Several other studies show indirect support for the advantages of trauma system implementation.^{19,20} There is also evidence supporting negative consequences associated with the transportation of patients to other facilities after stabilization.²¹

Mortality rates have also been compared between urban pediatric and non-pediatric trauma centers and rural non-pediatric trauma centers. In one study, the urban centers specifically designed for pediatrics received more pedestrian injuries and falls, while rural non-pediatric centers received more motor vehicle accident passengers. Death rates were the greatest for these rural non-pediatric centers, at 6.2 percent. Both pediatric and non-pediatric centers in urban areas had similar death rates yet were significantly lower than their rural counterparts.¹²

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BARRIERS

Emergency medical services in rural areas face many challenges, making it difficult to provide adequate and timely service to each surrounding area. Providers of these services are often volunteers who have received only the most basic of training.^{3, 4} These volunteers typically must also report to the unit before actually traveling to the scene, contributing to the response delay.¹⁷ Lack of financial resources also factor into a community's ability to provide adequate and efficient EMS equipment and services.^{3, 22}

Physician recruitment and retention are two major problems rural hospitals face. General and family practitioners are frequently relied upon to provide hospital-based emergency care in rural areas, while many are not adequately trained or certified to do so.⁶ Many hospitals are contracting out these services to provide emergency coverage, but in doing so, incur great financial burdens.²³

General and family practitioners are frequently relied upon to provide hospital-based emergency care in rural areas.

Trauma systems experience many of the same challenges as the rest of EMS. Logistical circumstances, longer transport distances, economic

hardships of practicing medicine in a small town, lack of sophisticated emergency-care delivery systems, and the critical nature of managing common, blunt-trauma injuries all make creating an effective system for rural areas difficult.⁵

PROPOSED SOLUTIONS

There are a number of solutions that are feasible to improve EMS in rural communities. Geographic information systems (GIS) can be utilized in a number of ways in an effort to improve pre-hospital services in rural areas. This is being used in an effort to dispatch the most efficient mode of transport to

the incident sites,²⁴ as well as in 911 dispatching to aid the responders in determining the quickest route to those sites.²⁵

For in-hospital emergency care, telemedicine offers rural facilities the opportunity to take advantage of the skills and knowledge of those in other locations.²⁶ Trauma systems, when implemented in rural areas, should incorporate other services in addition to making tertiary care available at a Level I or II trauma center. Trauma prevention must be promoted; all participants of the referring and accepting institutions should share responsibility for the trauma patients; and referring patterns should be bi-directional, as to allow for those patients who can be appropriately cared for in a smaller hospital, to be "back referred" from the larger facilities.²⁷ Cooperation at each of these levels may help achieve a goal of having the Level I and II centers contribute to the development of the Level III centers.

Implementing a statewide surveillance system is one potential solution suggested to aid in providing effective and efficient emergency medical services to children. The system would allow the identification of specific injury patterns, allowing the development of prevention programs that focus on those injuries for which a particular area is at a higher risk.²⁸ Education of pre-hospital providers in the specific nature of care required for pediatric patients would also allow those children needing trauma services to receive the appropriate level of care.^{29, 30}

SUMMARY AND CONCLUSIONS

Access to rural emergency medical services encompasses several elements including pre-hospital care, emergency room care, trauma systems, and pediatric care. Through close interaction, these elements constitute emergency medical care as a whole, but they must be analyzed individually for the entire system to be understood. Each component possesses its own unique challenges and issues, and it is only by taking all aspects of the problem into account that progress will be made.

MODELS FOR PRACTICE

The following models for practice are examples of programs utilized to address this rural health issue.

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MODELS FOR PRACTICE

FOCUS AREA: ACCESS (EMERGENCY MEDICAL SERVICES)

Program Name: Rural Health Community Systems

Location: Steuben County, New York

Problem Addressed: Rural Emergency Medical Services Access

Healthy People 2010 Objective: 1-11

Web Address: <http://www.steubencony.org/emo/rhcs.html>

SNAPSHOT

Rural Health Community Systems (RHCS) was created in 1997 when the CEOs of Ira Davenport, Noyes Hospital, and Rural/Metro Medical Services Southern Tier formed an official “Rural Health Network.” A rural health network is an administrative tool that has the flexibility to establish new systems that can be used by providers to plan, coordinate, and deliver health care services. This rural health network now covers all of Steuben County and the environs of Allegany, Livingston, Ontario, and other counties in the State of New York. The Rural Health Community Systems Rural Health Network decided to focus on emergency medical services (EMS) and to help EMS agencies in the county recruit and retain even more quality, dedicated, and knowledgeable volunteers. The Rural Health Network developed activities including a regional EMS system review, an EMS youth corps, hospital emergency department and EMS personnel integration, and a program to provide regional law enforcement vehicles with automatic external defibrillators for use in sudden cardiac arrest.

As a result of its activities, RHCS was chosen as an example of “best practice” by the National Rural Health Association EMS vision conference.

THE MODEL

Blueprint: RHCS was created in 1997 and is an association of nonprofit and proprietary corporations, public agencies, and individuals providing health care and related services in central Steuben County in New York State. Steuben County has a population of 98,726 (U.S. Census, 2000) and is classified as non-metropolitan using the rural-urban continuum coding methodology (ERS: USDA, 2000). The organizations came together in a collaborative forum to address common rural health service issues. RHCS’s Rural Health Network focuses on emergency medical services, with the objectives of expanding the scope of access to EMS and expanding system resources for community education about EMS. In other words, the network was developed to respond to a crucial need—helping to smooth the rocky

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road of service provision and improving access to EMS—not to provide services.

The network identifies, addresses, resolves, and monitors activities considered necessary for an improved EMS service delivery system. An initial project of the network was to facilitate a study of the EMS systems in Steuben and Livingston Counties of New York, which provided a better understanding of the situation and a foundation on which to plan needed activities. In an attempt to foster improvement within the emergency medical care continuum, the network facilitated the integration of the area emergency department and local paramedics. This supplied additional personnel to provide care in the emergency room and provided advanced training to the area paramedics. Another project initiated by the network was the placement of automatic external defibrillation units in county law enforcement vehicles and the training of deputies and troopers in their use. In an attempt to promote awareness and to improve recruitment, the network collaborated to develop and implement an Emergency Medical Services Youth Corps Project. This project is a collaborative effort between RHCS, schools that support the program, interested EMS agencies, and youth participants. The program is open to youth who are at least 14 years of age and exposes them to the world of EMS through fun and educational hands-on activities and meetings with participating volunteer ambulance corps to which they are assigned.

Making a Difference: While RHCS does not report any outcomes measures, they have established community-oriented goals. These include:

- Help youth become more involved in the community, giving them a sense of community service.
- Help EMS agencies in the county recruit and retain even more quality, dedicated, and knowledgeable volunteers.
- Assist schools in helping students' transition from a school environment to a work environment in today's highly complex work setting.
- Give youth a sense of pride in the EMS corps and its accomplishments, a direction for the future, and skills they can always use.

Beginnings: In the early 1990s, a study of primary care needs was done by the Health Systems Agency, which indicated the need for a closer examination of how emergency transportation was being handled in New York State. RHCS was originally organized in 1997 through grant funding of the state's Health Care Reform Act, which authorized over eight million dollars for the improvement of rural health access in New York State. Most of the projects that were initiated by the network are now "stand-alone."

Challenges and Solutions: As do many other community organizations, the network faces challenges with bureaucracy, poor communication, local

tradition, and culture. To address these, RHCS reaches its constituents and promotes its activities through the development and implementation of a media day, press releases, newsletters, a website, word of mouth, community/school presentations, and personal contact. To subsidize funding shortfalls, the network depends on its members to provide in-kind services and continuously canvases for additional support through membership connections.

RHCS received the New York State Department of Health Dr. Martin Luther King Healthy Community award. It was also chosen as an example of “best practice” by the National Rural Health Association EMS vision conference.

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MODELS FOR PRACTICE

FOCUS AREA: ACCESS (EMERGENCY MEDICAL SERVICES)

Program Name: TENKIDS EMS Computer Network

Location: Bozeman, Montana

Problem Addressed: Rural Emergency Medical Services Access

Healthy People 2010 Objective: 1-11

Web Address: www.citmt.org

SNAPSHOT

Providing continuing education opportunities, training, and improved communication are challenges to the provision of emergency medical services across the nation, but they are particularly challenging in remote areas. The TENKIDS EMS Computer Network was established to address this challenge in Montana. The three primary objectives of the network are to provide educational opportunities for remote and volunteer emergency medical services (EMS) providers, to improve patient record keeping and the aggregation of those data for epidemiologic and administrative purposes, and also, and to improve the communication among and between the providers and state-level authorities. The project covers the entire state of Montana, where extremes in weather, terrain, and travel distances to continuing education opportunities isolate many providers.

The network primarily targets EMS providers across the state of Montana, particularly those in the most remote areas.

THE MODEL

Blueprint: A number of organizations contribute to the success of this network. The Critical Illness and Trauma Foundation (CIT) provides leadership, oversight, equipment acquisition, and some technical assistance. Burns Telecommunications Center at Montana State University aids in distance learning, technical assistance, and software support. The Emergency Medical Services and Injury Prevention Section of the Montana Department of Public Health and Human Services helps in equipment upgrade and software support. Finally, there are 123 emergency medical services agencies with over 4,000 members (85 percent of whom are volunteer) serving communities across the state. The network primarily targets EMS providers across the state of Montana, particularly those in the most remote areas. The providers use the information and technology to improve patient care.

The network provides asynchronous learning opportunities via interactive CD-ROM, web-based curricula, and web-cam interaction to responders in the field. The needs of the patient data collection system are met by providing a platform and necessary software. And, finally, an Internet-

accessible bulletin board dedicated to Montana EMS issues helps to alleviate many communications challenges.

The backbone of the system is a multi-media personal computer placed at each ambulance service administrative office in the state. These individual computers are networked together by the Internet, and specific software and programs are provided for data collection and EMS education. The training and communications intervention occurs at the ambulance station or, in some cases, on the individual EMS provider's home computer. The data collection intervention occurs only on the computer at the ambulance station.

Making a Difference: More than 3,000 EMS providers have participated in some form of training using the TENKIDS infrastructure. Data collection processes have begun, and dozens of providers each week utilize the TENKIDS bulletin board system as a routine communications venue. The TENKIDS network has been featured in the premier EMS trade journal, and two peer-reviewed articles have confirmed the efficacy of the project.

Beginnings: In 1995, the Office of Rural Health Policy awarded the Critical Illness and Trauma Foundation with a half million-dollar grant, while the Montana EMS and Injury Prevention Section also received funding. The problems to be addressed were identified through focus groups at various EMS conferences and through feedback provided to the state EMS office and CIT. Working together, project leaders built the infrastructure of the TENKIDS electronic community, installing computer hardware and software in every licensed ambulance service in the state. The Burns Telecommunications Center at Montana State University – Bozeman made access to the electronic bulletin board possible, therefore allowing for the exchange of on-line information. Continuing education is achieved through the development of interactive CD-ROM programs, with electronic patient care records making up the final component of the system. The installation of data collection software allows for ambulance services to analyze local patient care information, as well as to share data that will provide the first statewide information about pre-hospital emergency care.

Challenges and Solutions: High turnover rates among volunteer EMS personnel make the need for ongoing training and technical support ever-present. This has been overcome by periodic "circuit rider" events where technology training is taken to the local level so as many EMS providers as possible are aware of and able to use the network. A second challenge is keeping the network technologically up-to-date. This has been accomplished by building support for the system into a myriad of grant applications and other opportunities. Currently, the network is on its third generation of desktop computers, and more than a dozen EMS-specific training programs have been developed and delivered over the network.

Other than technology updates and the need for ongoing technology training, both of which are supported through external funding resources, the overall maintenance of the system has been relatively inexpensive. Program staffing is provided via one paid and one donated staff member (each 50 percent time) and six to 10 volunteer staff. National and state publications, feature articles for various levels of media, professional meeting presentations, and “circuit rider” technology training all serve as a means to promote the network and increase awareness of it. The network has also received national recognition through the Peter F. Drucker Foundation for its non-profit leadership and internationally through the Stockholm Challenge for innovative technological applications.

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