

Public Health Perspectives

An Emerging Role for EMS

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EMS MAGAZINE



Instead of scrambling to keep up with all those 9-1-1 calls, how about getting out in front of them, and stopping them before they happen? That's not traditionally been the role of EMS—we're reactive, not proactive—but in this special section, we examine how it could be. With a greater embrace of the public health component of their roles, EMS providers can help people identify and better manage their conditions and diseases and make healthier choices in their lives. This can improve their overall well-being and reduce the frequency with which they require our services. As you read the following articles, consider how ideas like these might apply to your service.

EMS & Health Promotion

A next step in the collaboration between EMS and public health

As an integral part of the overall health-care system,¹ EMS systems and their underlying missions are being reshaped by evolving market forces, expanding needs, changing community expectations² and a broadening perspective of health.^{3,4} This article discusses potential roles for such reshaped EMS systems within public health, specifically in health promotion, using a hypothetical example of a target issue—aging—to demonstrate the opportunities, identify the barriers to be overcome and suggest possible solutions to those barriers.

EMS AND PUBLIC HEALTH

From a public health perspective, being healthy is more than simply not being sick. The constitution of the World Health Organization says, “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”⁵ This perspective of health—along with the recognition that health is a basic right of all people, is necessary for both the economic and social development of societies, and has global implications—has been reconfirmed by a series of consensus conferences.^{3,6,7} But can such a holistic view of health be relevant to EMS?

EMS is not solely about delivering medical care to individual patients. It is also part of both the larger public safety infrastructure and the public health infrastructure.^{1,2,8} By its nature, EMS is part acute medical care, part public health, part mental health, part emergency service, part community service, part social service, part transportation service and more. Further, EMS professionals see firsthand—in people’s bedrooms and living rooms, in their cars and in their workplaces, in neighborhoods and communities—the interactions between individuals, their health, economic and social circumstances, community structure and resources, and environmental factors.² Indeed, a holistic view of health

is as relevant to EMS as to any health discipline—maybe more relevant.

Recognizing the “dissimilar but complementary” nature of the services provided by EMS and by public health professionals in the United States, a working group assembled by the National Highway Traffic Safety Administration (NHTSA), the National Association of EMS Physicians (NAEMSP) and the American Public Health Association (APHA) identified eight potential benefits from combining EMS and public health efforts as listed in *Table 1*. Ultimately, the participants concluded, “The bottom line is that a collaboration of EMS and public health will lead to improved health in the community.”⁹

EMS AND HEALTH EDUCATION

Health education can be a complicated endeavor. Presumably, better informed people avoid unhealthy behaviors, opting instead for healthy behaviors. In fact, it is not that simple: Well-informed people often continue to smoke, eat fat-laden foods and exercise less, drink and drive, and engage in a long list of other unhealthy behaviors. Health behaviors—those actions that otherwise healthy people take in order to stay healthy—are influenced by a number of things, including social and demographic factors (such as marital status, age, sex), peer influence (family, friends, coworkers), perceived or experienced symptoms of disease (or the absence of any symptoms) and psychological or emotional influences (such as stress).¹⁰ Providing information alone is not enough; it is also necessary to provide “encouragement of attitudes that increase the likelihood that health knowledge will be transformed into personal action.”¹¹

Incorporating health education and an understanding of health behaviors into an EMS system’s mission can contribute to the everyday mission of providing patient care. EMS providers who recognize the complexities of behavior change will have

a better understanding of why the emphysema patient hasn’t stopped smoking or the heart failure patient still eats potato chips by the bag, and will provide better, nonjudgmental care. In some circumstances, an EMS provider who is knowledgeable about health behavior change theory might even be able to make a brief intervention during a patient encounter.

EMS AND HEALTH PROMOTION

Health promotion is more than health education. Health promotion takes the holistic view: Health is not just wellness or healthy behavior, but rather is interdependent with economic, social and environmental well-being.⁵ This interdependence is a key idea in health promotion: Economic, social and environmental well-being are not only resources that lead to health, but health is also a resource that leads to economic, social and environmental well-being. They are inseparable resources. Health promotion works to give people greater control of their health, to give them greater control of their resources.¹²

One of the cornerstones of health promotion, the Ottawa Charter, identifies three primary mechanisms for promoting health: advocacy for health and for a holistic view of health; enabling people by creating equity in terms of access, opportunities, resource availability and life skills; and mediation among governmental, industrial, health, community and other sectors of society to increase recognition of, and promote actions that take into account, the interdependent and intersectoral nature of health.⁴ EMS is uniquely situated to contribute to these efforts. As discussed earlier, EMS professionals see the interplay between health, economic security, social status and environmental conditions on a daily basis² and see that those people with the least control over these resources are the ones who suffer most. EMS professionals are also held in high esteem,⁸ and, as a result,

are in a strong position to advocate for the holistic view of health. EMS systems offer universal access (anyone can call for an ambulance at any time for any reason) and equitable resource availability (the same equipment and same personnel are dispatched to every “possible stroke” that occurs in a community, regardless of whom the patient is, where the patient lives, or how well insured that patient is), embodying the concept of enabling. Finally, as also noted earlier, EMS systems are inherently intersectoral^{1,2} and well-positioned to mediate among and between governmental agencies, businesses, the healthcare industry, nongovernmental organizations, communities and individuals.

There have already been some EMS-based health promotion efforts, primarily in the area of injury prevention.^{2,8,13} One of the earliest and most successful initiatives emerged in San Diego, CA, where, after the tragic drowning of a young boy, a paramedic used EMS system data showing trends in backyard drownings to rally his EMS colleagues into a community education campaign and a series of legislative efforts. The result was a demonstrable reduction in childhood drowning. The experience was the springboard for the EPIC (Eliminating Preventable Injuries in Children) Foundation, which now supports other EMS-based injury-prevention programs and which, each year, presents the most exemplary of those programs with an award.¹³

The Ottawa Charter outlines a framework of five strategies for health promotion: 1) build healthy public policy, 2) create supportive environments, 3) strengthen community action, 4) develop personal skills, and 5) reorient health services.⁴ These strategies are further explained in the example below.

A (HYPOTHETICAL) MODEL FOR EMS-BASED HEALTH PROMOTION

The areas in which EMS-based health-promotion activities could be pursued are virtually unlimited. Injury prevention, the needs of the very young and heart disease are just three prominent areas that would be appropriate for EMS-based

Table I: Benefits of Collaboration Between EMS and Public Health

Reduced healthcare costs: “A greater range of resources and options for delivery of services, offering improvements in efficiency and reduced costs.”

Greater accountability: “Reduce uncertainty about roles and improve accountability for community health.”

Education: “A simplified delivery system and improved community outreach.”

Coverage: “Combining the unique surveillance and access resources...improving reach into underserved areas and populations.”

Security and stability: “Assess the relative value of health services and allocate healthcare funding to provide the greatest value to the community.”

Access: “Extend the reach of EMS and the mobility of EMS to enhance the delivery of public health services.”

Adaptability: “A combined EMS and public health system will be capable of quickly detecting and responding to community health needs.”

Improved health: “Improved responsiveness, greater efficiency and enhanced effectiveness will lead to improved health in the community.”

Benefits identified by the NHTSA/NAEMSP/APHA Working Group on EMS and Public Health⁹

health-promotion initiatives. Those areas, however, come with the prejudice of work that has already been done and thus biases, based in history, about what role EMS should play. In order to start with a clean slate and get “outside the box,” it is useful to consider an example that has important EMS implications, but in which most previous and existing EMS initiatives have concentrated on clinical care: aging.

THE CASE FOR AGING

The aging population has profound implications for EMS. First, many aged people suffer poor health directly—not just clinical health, but holistic health.^{12,14} The elderly constitute a significant proportion of people struggling with disabilities and chronic diseases.¹⁵ They are also a vulnerable population, often economically disadvantaged, socially excluded and living in environments that few would describe as desirable.^{12,14} Second, “the elderly consume hugely disproportionate healthcare resources,” which are then not available for other potentially more cost-effective health initiatives—including EMS

initiatives.¹⁵ Third, of explicit importance to EMS, older people have high rates of ambulance service utilization, and, as the population ages, demand for EMS services will increase dramatically.¹⁶⁻¹⁸ Finally, and of direct importance to all, everyone ages. EMS has a stake in aging.

It might be argued, paradoxically, that improvements in health are in fact the reason aging is an issue. The increase in life expectancy is attributed, at least in part, to improved health.¹⁵ Here it is important to differentiate between health and life. Health promotion is about maintaining wellness, quality of life and functional ability for as long as possible; it is not about longevity at all costs.

OPPORTUNITIES

What opportunities exist for EMS-based health promotion activities that target aging? Using the strategies laid out by the Ottawa Charter,⁴ below are some examples of how EMS-based health promotion might target aging, reducing morbidity by empowering people to control their own health:

1. Access to healthcare is a determinant of health.¹⁴

In the United States, EMS sees the effects of inequities in access directly: Patients frequently depend on emergency services for what should otherwise be delivered as primary healthcare, sometimes because general practitioners refuse to see uninsured patients or patients covered by Medicare or Medicaid. Even in societies with universal health coverage, however, there are inequities in access to care: Rural areas have fewer health resources than urban areas; the wealthy may still have access to separate, private health services.

Access to healthcare could be partially addressed through building healthy policy. Building healthy policy means establishing policies that make healthy choices the easier choices; it does not mean passing laws that dictate behavior. EMS could advocate for policies that increase equity in health access, from something as simple as extending office hours on a local level to employment policies that allow “health leave” and not only “sick leave.” Enabling access to healthcare not only has immediate effects on the currently aged; access to adequate healthcare for the currently (relatively) young will result in improved health for those individuals (and therefore reduce their demand for EMS) as they become older. The adoption of such policies will require mediation between governments,

the elderly to remain independent once they reach the stage at which driving is no longer prudent. Transportation issues could be addressed by creating supportive environments. Creating supportive environments means recognizing the socio-ecological interrelations between environments and health, and therefore working to develop environments in which people take care of each other, their communities and their natural resources. EMS could advocate for efficient public transportation systems, mediating between transportation departments, local businesses, state Medicaid officials and taxpayers to help them recognize that building and maintaining efficient public transportation enables healthy transportation choices in the young and independence in the aged, which compresses morbidity and serves each of their respective interests.

3. Social exclusion and social support are determinants of health.¹⁴

In many areas, particularly rural areas, there are too few assisted-living facilities. As a result, those elderly who cannot live independently are forced to move away from their homes, families and social networks. The precipitous decline in health that is often seen after such a move—and which inevitably consumes EMS resources—is usually attributed to the aging process, with little thought given to the role of social isolation. Social exclusion could

contact with their established social support systems.

4. Food is a determinant of health.¹⁴

Lack of food is one problem, but poor food choices are another. The food choices made throughout life cumulatively impact health in later years. Food issues could be addressed through developing personal skills, which means giving individuals the tools they need to control their own health. EMS can help individuals develop better eating habits—not only the elderly, but everyone. EMS can advocate good eating habits, perhaps through sponsoring a community garden; EMS can mediate between school officials and the food industry to ensure that appealing, healthy lunches are available to all children, enabling them to develop good eating habits early in life—habits that will pay off (for both the individuals and the EMS system) when they reach old age.

5. Reorienting health services is important to all determinants of health.⁴

Reorienting health services means moving away from a focus on therapeutic intervention and moving toward services that take a holistic view of health, toward services that recognize the influence of economic, social and environmental factors on health. Historically, EMS responds to existing illness or injury, but the reshaped EMS systems of the future will also promote health. An existing example of such reorientation of services that targets aging has been reported in Rochester, NY, where researchers have demonstrated that EMS providers can screen older adults during the course of an emergency response for their influenza immunization status.¹⁹ If such a role were adopted as routine practice, EMS would become an advocate for immunization, mediating between emergency services and traditional public health to enable the elderly to choose and obtain immunization.

Importantly, these are not the only—or even the best—opportunities for EMS-based aging-related health promotion; these are examples. An actual health-promotion program would need to independently identify the most appropriate

Historically, EMS responds to existing illness or injury, but the reshaped EMS systems of the future will also promote health.

employers, healthcare providers, insurers and taxpayers.

2. Transportation is a determinant of health.¹⁴

People who use public transportation typically get more exercise, and modern public transit systems have less environmental impact than automobiles. People who get more exercise and live in cleaner environments enjoy better health throughout their lives. Efficient public transportation systems also allow

be addressed through strengthening community action, which means involving communities in determining and pursuing their health needs and empowering communities to take care of themselves. EMS can work with communities to increase the availability of local assisted-living facilities by advocating for grassroots action demanding such facilities and by mediating between community organizations, government agencies and corporations that run such facilities, thus enabling the elderly to maintain closer

activities for that program based on local needs and resources. There might be clear opportunities for EMS-based health-promotion activities; there might also be opportunities for EMS to be a key multisectoral partner in broader health-promotion initiatives based in other areas. For example, EMS systems are cooperating with World Health Organization “Safe Communities” projects in several cities throughout the world. Health-promotion activities do not exist in a vacuum, and there is often significant overlap among individual initiatives, as well as the various strategies outlined by the Ottawa Charter. For example, a county health department initiative to build health capacity might include supporting policies that justify and support health promotion as part of the EMS system’s mission, and thus facilitate reorienting of the health services provided by EMS. The opportunities are practically endless.

BARRIERS

The barriers to any EMS-based health promotion activity are multifaceted. They are the barriers to health promotion generally,¹⁰ barriers to health promotion in a clinical environment,²⁰ difficulties associated with establishing new roles⁹ and the socio-political circumstances of today’s world.²¹ They are the same challenges that nearly any discipline would face in the early stages of adopting health promotion into its mission. These barriers might be stated like:

“We don’t do that. This is EMS. We save lives.”

Behaviors and health habits are ingrained by both culture and attitude, and structures of healthcare (including EMS) and social support systems are equally well-ingrained. Change—changing behaviors, habits, systems, anything—is hard, particularly when the reward for that change may not be evident until many years later.¹⁰

“I barely have enough time to put a heart failure patient on oxygen, start an IV and administer furosemide before we get to the hospital. When am I supposed to do health promotion?”

In the clinical setting, and particularly in the emergency setting, attention and resources are necessarily focused on

Table II: Sample Approaches for Overcoming Barriers to Health Promotion²²

Start with environmental and policy interventions: Working to create healthy environments or healthy public policy avoids some of the difficulties associated with directly trying to change individual attitudes and behaviors or the structure of the EMS system, has less immediate impact on clinical caregiving, and may be less threatening than an initiative that requires explicit patient-oriented action by paramedics. It may be a safer place to start.

Think comprehensively and across multiple levels: Health problems are multifaceted, and there is rarely one single intervention that can solve a health problem. Develop health-promotion initiatives that attack a problem on more than one front. They probably will not all be successful, but they might not all fail, either.

Use economic evaluations: Money talks. Demonstrating the economic benefits of improved health, or at least the continued costs of poor health, can facilitate change at the individual (patients and paramedics), institutional (EMS and healthcare system) and governmental levels.

Use existing tools: Adapt health-promotion initiatives and materials that have been successfully implemented in other areas and by other disciplines.

Understand local context: Determine the kinds of EMS-based health-promotion initiatives the community (individuals, organizations, business, government) will be most receptive to and start with those.

Understand politics: Identify key stakeholders in the community, and engage them in the efforts early. Be as inclusive as possible: Once invited, the health columnist for the local newspaper may decline to participate in an initiative; uninvited and scorned, the same columnist could torpedo the initiative.

Build new and nontraditional partnerships: Pursue an intersectoral approach to every initiative and be creative. The sanitation department might have incredibly useful insights about how to address youth violence. (Garbage collectors see a lot of things the rest of us don’t!)

Address health: Keep the focus on improving health—holistic health—and participate in health-promoting initiatives that arise from other sectors. Support a Parks and Recreation request for funding for a new green space because it is good for health. Help the police crack down on speeding because it is important to pedestrian health.

Learn from others: Keep abreast of what other EMS-based health-promotion programs are doing, the obstacles they’re encountering, and the successes they’re experiencing. Adopt things that have been shown to work elsewhere; don’t waste resources on things that have already failed.

Participate in research: Conduct ongoing evaluations of health-promotion efforts, and revise programs appropriately. Initiate, or at least participate in, scientific analyses of the results of health-promotion programs. Data supporting the effectiveness of EMS-based health promotion will help generate support for expanded and new programs.

patient care. Clinicians (including paramedics) often lack the time, skills, materials, facilities or even the interest to conduct health-promotion activities.²⁰

“Why are these EMS people out lobbying on behalf of the food stamp program? Clearly they have staff with too much free time. We need to reduce their payroll

budget and save taxpayer dollars.”

Adopting a new role can be threatening for health providers; it challenges existing culture, requires acquisition of new skills, and raises questions about how performance might now be judged. On a systems level, new roles can further exacerbate existing issues with limited funding, particularly when policy-makers may not see the need for an expanded role.⁹

“Clinic hours? We’ve got terrorists trying to blow up our country and you want to talk to me about the operating hours at the community clinic?”

The world is getting smaller, life is get-

ting faster, violence is increasing and uncertainty abounds. People (patients and paramedics, EMS system administrators and policy-makers) are scared and distracted. They have other pressing concerns.²¹

tion is one way EMS can contribute to the larger public health efforts,^{2,8} but EMS-based health-education initiatives need to be founded in strong behavior-change theory.¹¹ Taking on the broader challenge of health promotion is another way that EMS can help improve societal health, and those health promotion efforts also need a strong theoretical foundation.¹² Taking on a new role is always difficult. New skills will have to be developed; obstacles will have to be overcome.^{9,10,20,21}

By joining forces with traditional public health, EMS can help to improve health for all people.

Why should EMS participate in public health? Why not leave it to others? Because EMS itself will benefit from those

health-promotion efforts. More important, because health is more than not being sick;⁵ the responsibilities of healthcare, including EMS, go beyond simply treating the sick;^{3,6,7} EMS in its essence is more than healthcare;¹ EMS, more than any other discipline, sees firsthand the interdependence of health, economic security, social situations and environmental conditions;² and because EMS is uniquely positioned—perhaps better positioned than any other allied health discipline—to promote health. Because it’s the right thing to do.

SOLUTIONS

The barriers to health promotion are ubiquitous and apply to EMS as they would to any other health discipline. Yes, it will be hard, but it’s the right thing to do. Beyond that, some specific problem-solving strategies can be useful. Authors Ross Brownson, Debra Haire-Joshu and Douglas Luke²² listed 10 strategies for overcoming the difficulties associated with prevention of chronic disease that, with only minor revision, can be adapted for overcoming barriers to EMS-based health-promotion programs. Detailed explanations for and examples of each of these strategies are listed in *Table II*. These are certainly not the only strategies that might be successful. The literature is replete with descriptions of techniques for problem-solving and overcoming barriers; any of those approaches could likely be adapted for EMS-based health-promotion initiatives.

CONCLUSION

By joining forces with traditional public health, EMS can help to improve health for all people.⁹ Providing health educa-

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Advocates for Health

Emed Health turns to EMS for patient education, disease management

Two years ago, *EMS Magazine* published a series of articles titled *Taking EMS Into Tomorrow* (May-Oct. 2006). It generally promoted the idea of EMS providers serving in a public health capacity, assisting with things like injury prevention and disease management and education in addition to providing emergency care. The series generated a lot of feedback—everything from excitement from systems wanting to engage in such community service to cynicism from those who thought EMS should stick to its traditional business of dropping tubes, shocking hearts and hauling folks to the hospital.

Well, while the debate rages on, there is a group of pioneers in Pittsburgh who are turning the vision of EMS-facilitated illness prevention and chronic disease management into reality with what they call “emergency medicine-based health promotion.”

Emed Health, part of the Center for Emergency Medicine of Western Pennsylvania, Inc., is actively blending EMS with chronic disease management, health promotion and prevention. According to Executive Director Kelly Close, MD, MPH, “Emed Health’s goal is to take healthcare to people where they live and work and empower them with the tools, systems and knowledge to prevent and manage their own health and chronic diseases.”

Emed Health is doing all the things the cynics said couldn’t be done. Here’s how these pioneers are doing it.

‘THE EMS MODEL’

Emed Health uses what it calls the “EMS model,” which entails subcontracting with local EMS organizations to provide services to people in their communities. EMS providers are suited for this role because they are well-integrated into the communities they serve and can be an underutilized healthcare resource, especially in rural communities.

Emed Health provides the training, patient programs, contracts for services with payers, data tracking and analysis,

and quality management systems. The subcontracting model prevents Emed Health from competing with EMS agencies for providers, allows the agencies to determine when and how they will become involved, enables use of agencies’ existing malpractice and worker’s compensation policies, and provides a scalable model with few fixed costs, since services are only contracted for when there is work. This leads to lower costs to payers and patients and makes it cost-efficient to provide personalized healthcare prevention and disease management services in the community and in patients’ homes.

Emed has contracts with insurers, employers and hospitals to deliver services, which means a sustainable source of income for EMS agencies. It also creates alternative career opportunities within the existing system for EMS personnel who enjoy public health, education and continuity of care, especially if they are among the 27% of providers who leave EMS each year due to injury, burnout or an inability to meet the field’s physical demands. Part of the Emed Health vision is that EMS can become

stay healthy. From a financial perspective, it is less expensive to prevent and manage complications of chronic diseases than it is to treat them over and over again as emergencies.

“We started getting involved with injury prevention at the university, and it got me thinking about prevention in general,” says Paul Paris, MD, FACEP, chief medical officer of the Center for Emergency Medicine (a multihospital consortium in western Pennsylvania dedicated to advancing emergency medicine) and one of the creators of Emed Health. “I started reading about health promotion and wellness and was dumbfounded to discover that 70% of healthcare dollars are spent on caring for patients with chronic diseases, such as asthma, congestive heart failure and diabetes. When you buy a GM car, \$1,700 goes toward healthcare costs—more than the cost of the steel in it.”

Anne Boland Docimo, MD, MPA, chief medical officer for the University of Pittsburgh Medical Center (UPMC) Health Plan, says programs such as Emed Health’s diabetes prevention and asthma management programs can offset the rising costs of hospital care. “The more

Emed has contracts with insurers, employers and hospitals to deliver services, which means a sustainable source of income for EMS agencies.

a place where people can still work even when they can’t lift stretchers anymore. Through prevention, wellness promotion and chronic disease management, Emed creates an interesting alternative career path for EMS professionals while improving the healthcare system for patients and payers alike.

Emed Health is finding that its patient customers are visiting emergency departments less often and have improved quality of life. The EMS “health advocates” trained to implement the programs get a lot of satisfaction from helping people

patients who receive education on how to manage chronic illness, the fewer patients there will be who develop complications and have higher healthcare costs down the road,” Docimo says.

Here are some of the pioneering programs Emed Health is currently developing. Input from the medical community and the general public is always welcome at www.emedhealth.com.

ASTHMA

According to Rodney Jones, vice president of operations for the UPMC’s

Braddock Hospital, the health disparities in his area are among the worst in America. “We fall below the county, country and world in cardiovascular disease, infant mortality, diabetes and asthma,” Jones says. Braddock is the main health-care provider for a population in which one third of children and half of adults live in poverty. Three quarters of the hospital’s patients come in through the emergency department.

Nationwide, 5%–7% of children suffer from asthma. In the neighborhood served

Emed also helps with logistical considerations that are often barriers to optimal care. For example, EMS health advocates help patients who have trouble paying for their medications find programs that can assist. They also help them fill out forms for free transportation services so they can see their physicians or get prescriptions filled.

As an EMT for nearly 18 years, Becky Miller treated people with broken legs, heart conditions and dog bites. Recently, she joined the Emed Health asthma dis-

care for their diseases, the patients stay healthier, the EMS system runs fewer calls, and the hospitals provide less uncompensated care.

Jones says it’s better for him financially to pay Emed Health to provide this service for his asthma patients. “It costs us less to provide this program than it does to provide unreimbursed emergency department care to these patients,” he says. “We have a commitment to addressing the healthcare disparity in our community. About half of my 700 employees live in this community. Using a unified approach with our employees, 50 other community groups, faith-based organizations and patients, we are going to make this a healthier community.”

Results of the asthma program for uninsured patients have been positive. Patients get surveys at intake and at the end of the home visits. The same survey was also mailed to patients six months after the home visits. A validated Risser satisfaction survey was also administered anonymously at the end of the home visits.

At the beginning of the study, 60% of participants reported being in an emergency department in the last six months for an asthma-related visit. Three months after starting the program, that figure had dropped to 10%. Similarly, at the beginning of the study, 36% had been hospitalized overnight for asthma-related illnesses, but after three months that figure was down to 5%.

The satisfaction survey results indicate that participants found great value in the services they received. All patients agreed that their EMS health advocate was understanding in listening to their problems. Patients strongly disagreed that their EMS health advocate was too busy to spend time talking with them, which is a common complaint of patients following traditional healthcare visits. Overall, patients reported they were extremely satisfied with the disease management program.

DIABETES

In 2004, approximately 23,000 Pennsylvanians were hospitalized for diabetes-related problems, costing about \$673 million. Emed Health modified the National Diabetes Education Program

Participants in the program get to make a difference in people’s lives in a way many medical providers don’t.

by Braddock, it’s 25%. Poverty contributes to the problem, combined with lots of smokers and deplorable living conditions. “We have a large number of asthma patients who come to the emergency department every week,” says Jones. “For those who have insurance, 80% are covered by Medicare or Medicaid, and they won’t cover people who return to the hospital within 30 days of their last visit.” Emed Health created an in-home asthma management program to help Braddock’s patients better manage their disease.

Emed trains paramedics and EMTs from local EMS services to administer the asthma program. The program consists of several home visits in which patients are provided education on their disease, proper use of peak-flow meters, spacers and medications, management of environmental triggers, interacting with physicians and developing action plans, and are given program assessment tools such as satisfaction and quality-of-life surveys.

ease management program as a health advocate. “The woman I was working with learned she was taking her medicine wrong—she was totally amazed,” says Miller. “She also didn’t know she had triggers in her house, like dust and mold.”

Twenty-five patients have been through the program so far. According to one, “I’m not sure I’d still be alive were it not for these people helping me. They taught me how to take care of myself much better than the doctor. I’ve had asthma most of my life, but it’s been getting real bad the last few years. I was going to the emergency department once or twice a week. Since they helped me take better care of myself, I haven’t been once.”

John, a paramedic with the local Guardian Angel Ambulance Service, says, “Most patients never really learned how to use their peak-flow meters. We take the time to teach people.”

EMS providers enjoy helping their “frequent fliers” by their providing these patients with the skills necessary to

Table I: Mike Parlak’s Screening Results

	Initial screening	3-month screening
Weight	233 lbs.	175 lbs.
Body Mass Index (BMI)	36*	25*
Blood pressure	123/91*	118/62
Waist circumference	46 inches*	33 inches
Triglycerides	147 mg/dl	89 mg/dl
Glucose	104 mg/dl*	85 mg/dl
HDL	45 mg/dl	47 mg/dl

* Indicates a risk factor for diabetes

Other Resources

www.cdc.gov—The CDC has information on vaccination recommendations, health screening guidelines and chronic disease management.

www.welcoa.org—The Wellness Councils of America offers information about the costs and benefits of health programs in the workplace.

www.dmaa.com—The Disease Management Association of America.

www.nchec.org—The National Commission for Health Education Credentialing offers training and credentialing for health educators.

<http://web.ncqa.org>—The National Committee for Quality Assurance is dedicated to developing quality standards and measurements for healthcare entities.

www.motivationalinterview.org—Resources for clinicians, researchers and trainers on how and when to use this technique to motivate behavior change.

to help keep front-line emergency workers and their families from developing this deadly disease. The program's initial focus was on the personnel and families of EMS, fire and police departments. Participants for the intervention group were recruited from two rural counties that had among the highest rates of diabetes in Pennsylvania. To qualify for the study, participants had to have metabolic syndrome, consisting of an elevated body mass index plus at least three of the following: 1) elevated glucose (but not yet diabetic), 2) high blood pressure, 3) abdominal obesity, 4) low HDL (good cholesterol) and 5) high LDL (bad cholesterol).

Fifteen intervention group members participated in 12 classes (taught by EMS health advocates who went through the National Diabetes Education Program curriculum) and were given free gym memberships. During these classes the public safety workers learned about diabetes prevention, such as how to eat right, use a pedometer, exercise regularly and utilize a food diary to track their intake. Eight control group members received information and free gym memberships, but no classes or health coaching. All participants were screened three and six months after starting the program.

Although six-month results have yet to be measured, at three months the mean weight loss was 16.1 lbs. in the intervention group and 11.3 lbs. in the control group. One patient, police officer Mike Parlak, is much less likely to develop diabetes since completing Emed Health's prevention program (see *Table 1*). Parlak knew he was overweight and had high cholesterol, but didn't know he had an

elevated fasting glucose level and several other risk factors that increased his chances of diabetes.

"My doctor had been after me to lose weight and exercise more, but I had no idea I was at such high risk for developing diabetes," Parlak says. "The classes were really helpful—no one was judgmental, and we were all very comfortable discussing our progress. The best part was getting weighed each week. I loved to see the results of my hard work paying off."

Three months later, Parlak has lost weight and lowered his blood pressure, cholesterol and fasting blood sugar, significantly reducing his odds of becoming a diabetic. He's gained knowledge he'll be able to use for a lifetime. "I weigh myself every day," he says. "If I see my weight creeping up, I exercise a little longer and eat a little more carefully."

"A little work and education about proper eating habits and dedication to the program can change lives," Parlak adds. "I honestly feel better, have more energy and enjoy doing all the activities that were difficult for me when I was overweight and out of shape."

Once the final results of the program within the EMS and public safety community are available, Emed Health hopes to implement the program more widely in other businesses and systems.

HEALTH & WELLNESS

Some of Emed Health's programs' most important work has been in identifying at-risk individuals so they can be educated about changing their behaviors before they develop serious diseases. The majority of the health screenings have been performed in partnership with the UPMC

Health Plan. Emed has provided glucose, blood pressure, cholesterol and carbon monoxide testing for more than 17,000 people in the last year through this program. The success of these screenings has in large part been due to the vision and coordination of the UPMC Health Plan, one of the top-ranked health insurance programs in the country.

The program's top officials recognize that health promotion saves money by improving retention, morale, turnover and productivity rates. Rose Gantner, EdD, the UPMC Health Plan's senior director of health promotion, says a roughly 3:1 return on investment in health education can be expected in about two years, mostly from decreased absenteeism and turnover, but also from reducing the number of sick and unhealthy people who come to work anyway and perform suboptimally. For more information about the value of health promotion in the workplace, see the Wellness Councils of America's website, www.welcoa.org.

Gantner says that "Sixty percent of all illness can be changed with lifestyle modifications. Physical, mental, emotional, spiritual, occupational and family dimensions all can impact health. We have found that 80% of health plan dollars are spent on people who are high risk. Our goal is to keep the low- and moderate-risk people from becoming high-risk." A key part of achieving that goal is identifying those people and educating them before their conditions develop into something more serious.

During these screenings, Emed's EMS health advocates measure body mass index, heart rate, cholesterol, carbon monoxide, glucose, HDL, LDL, triglycerides and blood pressure. Height and weight measurements are used to calculate body mass index (BMI). At the end of the screening session, health educators from UPMC Health Plan provide participants with educational materials and counseling about their risk factors and the need to follow up with their primary care physicians. Patients can have their results sent to these physicians.

Participants in the program get to make a difference in people's lives in a way many medical providers don't. They've helped a pregnant woman with a high CO level find a gas leak in her home, sent

cont. on page 12

A New SPHERE for EMS

Supporting public health with emergency responders

Since its inception in the late 1960s, fire-based EMS has continually improved upon the original concept of providing rapid response to medical emergencies with trained firefighter/paramedics. Among the first in the United States to implement the concept, the Seattle/King County Medic One system often garners honors for the long-term survival rates of its sudden cardiac arrest patients. Many other excellent models exist, and annual incremental improvements have come to be expected as technology and medical studies further refine the state of the art. Everything from closest-unit dispatching to automated external defibrillators placed in public venues has been employed to help reduce the time needed to answer calls and give lifesaving care to those in need. But what if the very best response time to a medical emergency was actually 0:00?

Through the SPHERE program in Seattle/King County, there is a new goal in place: to actually prevent future 9-1-1 calls by identifying potentially life-threatening conditions whenever a patient is seen by responders.

Consider these two scenarios:

- EMTs evaluate a 57-year-old with a mild allergic reaction. Prior to EMS arrival the patient self-administered diphenhydramine (Benadryl) and has improved upon arrival of fire department EMTs. He is stable on exam, with a mild rash on his arms and trunk. His blood pressure is 170/105 and blood glucose (checked because the patient says he has bouts of low blood sugar) is 182 mg. He says he

will follow up with his doctor. The EMTs casually mention to the patient that his blood pressure and blood sugar are both high. But because of his stable condition, the EMTs decide that evaluation in a hospital is not needed. The medical incident report is completed and duly filed.

- Same situation, but this time the EMTs not only mention that the blood pressure and sugar are high, but also give the patient a personalized written “High Blood Pressure Alert” and “High Blood Sugar Alert” that strongly advise him to have follow-up for possible hypertension and diabetes. They indicate on the incident report that the alerts were given, and one month later the patient receives a call from the EMS office asking if he has followed up with a physician.

Which scenario do you think best serves the patient?

THE SPHERE PROGRAM

Every day, EMTs respond to countless medical emergencies. While providers’ top priority is to deal with the immediate problem, stabilize the patient and arrange further appropriate care, they also have opportunities to identify and help control major public health problems. In the second scenario above, the patient’s abnormal blood pressure and blood sugar are discussed, and he is given written, personalized and specific sets of instructions for follow-up. Such practice is now routine in the Seattle/King County metropolitan area.

The program is called SPHERE, which stands for Supporting Public Health with Emergency Responders. The sphere represents the concept of obtaining clinical information and feeding it back to the patient in a useful and consistent fashion—a circle of information from the patient to the EMT and back. SPHERE is designed to help identify and control two major public health problems: hypertension and diabetes. Though the program is an expansion of the traditional role EMS personnel play in their communities, it affords the opportunity to have a large impact with little extra effort. EMS

personnel can respond to medical emergencies and simultaneously help fight chronic disease (and possibly prevent future emergency responses).

High blood pressure (HBP) and diabetes are two major public health problems. High blood pressure affects 65 million Americans. It is estimated that one third of patients with HBP are unaware they have the condition, and another third inadequately control it. Around 20 million Americans have diabetes (85% have type II diabetes), and another 6–7 million have undiagnosed type II diabetes. Both conditions are major contributors to heart disease, stroke and kidney failure.

Since EMTs almost always determine blood pressure as part of routine vital signs, and frequently check blood glucose, they have a unique opportunity to identify new and uncontrolled cases of HBP and diabetes. In this sense the EMS system and its hundreds of thousands of personnel can serve as a virtual cadre of public health advocates. They enter the homes and businesses of a considerable portion of the population every year. In King County, the EMS system responds to approximately 7% of the population annually, many of whom are underserved or without a source of regular medical care.

HOW SPHERE WORKS

The inclusion criteria for SPHERE are simple (see *Table 1*). For blood pressure the criteria are a systolic of 160 or higher or a diastolic of 100 or higher. For diabetes the criteria are a blood glucose measurement of 175 or greater in a nondiabetic patient or 300 or greater in a diabetic. If these inclusion values are found, the patient is given the appropriate alert card and urged to follow up. The patient is also offered the opportunity to have follow-up checks at the fire station. EMTs are encouraged to use judgment when giving alerts; if the scene or situation is too unstable or simply inappropriate, alerts should not be provided. Examples of such situations are critical patients, major trauma, crime scenes

Table 1: SPHERE Criteria

Inclusion criteria for High Blood Pressure Alert

- Systolic BP \geq 160
- Diastolic BP \geq 100

Inclusion criteria for High Blood Sugar Alert

- Nondiabetics w/BS \geq 175
- Diabetics w/BS \geq 300

Exclusion criteria for both alerts

- Critical patients
- Major trauma
- MCI

Figure 1: High Blood Pressure Alert Card

not yet controlled by police, and mass-casualty incidents.

PILOT PROJECT

In order to decide whether EMTs should take on this new role, we conducted a pilot project between January and August 2006. EMTs in two King County fire departments participated. Eligible patients received high blood pressure and/or high blood sugar alerts during their medical incidents (see *Figure 1*). On the medical incident report form, EMS personnel recorded whether they gave an alert to each patient. The cards also listed a contact phone number for the fire department and numbers for the American Heart Association and American Diabetes Association.

During the pilot project more than 250 alerts were distributed, the majority (86%) given for high blood pressure. These patients had an average systolic blood pressure of 175 and an average diastolic of 94. Thirty-five patients (15%) received high blood sugar alerts; they had an average glucose level of 330.

Patients who received alerts were called about four weeks after their medical incidents. While the number of high blood sugar patients reached was not large enough to draw any meaningful conclusions, the analysis of high blood pressure patients, drawn from 69 telephone surveys, was extremely encouraging.

A majority of the patients interviewed remembered receiving alerts from EMS personnel (74%), and most reported positive reactions to receiving them (85%). Over half of the patients (59%) reported being motivated by their alerts to seek follow-up medical care after their medical incidents. In addition, almost two thirds (62%) of alert patients noted that their alerts influenced them to get their blood pressures checked again.

To complement the patient perspective on SPHERE, EMS personnel who participated in the alert interventions were also surveyed. Of the surveys returned within two weeks, an overwhelming majority were supportive of the SPHERE project, noting that it was not difficult to distribute alerts at scenes (77%) and that distributing alerts did not take up an inordinate amount of their time on scene (88%).

Open-ended questions on the EMS

survey yielded in-depth information from the provider perspective. A few respondents noted it was sometimes difficult to remember to give patients alerts, depending on the nature of the call.

NEXT STEPS

It is clear from the pilot study that EMS responders have the ability to help in the battle against chronic diseases in their communities, although further study is necessary to determine what works best in different locations. It may be that an alert followed by a personal letter from the EMS agency is more effective than an alert alone. Such a letter could include information about community resources for follow-up and treatment of high blood pressure and high blood sugar, especially for those who are underinsured.

The importance of properly training EMTs in this new role of public health advocates cannot be overemphasized. EMTs need to be equipped with background information about these public health problems and given the tools to properly respond to questions patients may ask when they are given alerts. EMTs need to buy into the importance of this program and view it as part of their mission for the program to be successful.

Although the pilot study was small, the results show the immense promise of SPHERE. Consequently, the SPHERE concept became part of the 2007 EMT protocols in King County, and all fire departments within the county are participating in the program.

Your fire department took your blood pressure during your medical emergency. Your blood pressure was very high.

Date: _____

EMT: _____

Your blood pressure: _____

Systolic: _____

Diastolic: _____

Blood Pressure Categories

Systolic	Hypertension	Diastolic
160	Hypertension Stage 2	100
140	Hypertension Stage 1	90
120	Pre-hypertension	80
< 120	Normal	< 80

High blood pressure can lead to life-threatening disease such as heart disease, stroke or kidney failure.

There are effective treatments for lowering high blood pressure.
You need to discuss this with a doctor.

We recommend that you have your blood pressure checked again as soon as possible. You may be called in a week or two in order to find out how you are doing.

THE POTENTIAL

EMTs visit a significant portion of the population in any given year. Though patients call for specific medical problems, there is an opportunity to, with little extra effort, help identify and control major public health problems. Blood pressure determination is a routine vital sign and part of virtually every patient's workup; thus high blood pressure values are readily and easily identified. Glucometry and blood sugar determination is not authorized throughout the EMT world, and in those agencies that are trained in glucometry, the indications for blood sugar determination may be limited (such as for patients with altered mental status or decreased level of consciousness). Despite these restraints, it seems reasonable to contemplate blood glucose as a routine procedure. If glucose were to become a fifth vital sign, it would provide opportunities to help identify the 2% of Americans who have undiagnosed type II diabetes. The public health benefit to the communities served by participating EMS agencies would be invaluable, and clearly lives could be saved if strokes or other maladies could be averted through notification, proper medical care and appropriate medication. By the same token, the fire/EMS community would also benefit due to a potential reduction in emergency call volume, reduced exposure to emergency traffic hazards, and the consumption of fewer resources.

For more on the SPHERE program, e-mail gingy@u.washington.edu.

ADVOCATES FOR HEALTH

cont. from page 9

We thank the 3,500 EMTs in King County for their excellent patient care and constant commitment to improvement. We are also grateful to the fire departments and fire chiefs in King County for their support and encouragement of SPHERE. These are: Arlington Fire Department, Chief Jim Rankin; Bellevue Fire Department, Chief Mario Treviño; Black Diamond Fire Department (#17), Chief Greg Smith; Bothell Fire & EMS, Chief Warren Burns; Duvall Fire Department (#45), Chief John Lambert; Eastside Fire & Rescue, Chief Lee Soptich; Enumclaw Fire Department, Chief Jim Zoll; Kent Fire & Life Safety, Chief Jim Schneider; King County Fire District #2, Chief Mike Maars; King County Fire District #20, Chief Mark Fitzgerald; King County Fire District #27, Chief Chris Connor; King County Fire District #40, Chief Paul Witt; King County Fire District #44, Chief Greg Smith; King County Fire District #47, Chief Mark Tessen; King County Fire District #50, Chief James Knisley; King County Fire District #51, Chief Matt Cowan; Kirkland Fire Department, Chief Jeff Blake; Maple Valley Fire & Life Safety, Chief Tim Lemon; Mercer Island Fire Department, Chief Walt Mauldin; North Highline Fire District, Chief Russ Pritchard; Northshore Fire Department, Chief Bob Peterson; Port of Seattle Fire Department, Chief Mike Mandella; Redmond Fire Department, Chief Tim Fuller; Renton Fire Department, Chief David Daniels; SeaTac Fire Department, Chief Bob Meyer; Seattle Fire Department, Chief Gregory Dean; Shoreline Fire Department, Chief Marcus Kragness; Snoqualmie Fire & Rescue, Deputy Chief Bob Rowe; South King Fire & Rescue, Chief Al Church; Tukwila Fire Department, Chief Nick Olivias; Valley Regional Fire Authority, Chief Mike Gerber; Vashon-Maury Fire & Rescue, Chief Keith Yamane; Woodinville Fire & Life Safety, Chief Dennis Johnson.

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Mario H. Treviño, MPA, CFOD, is chief of the Bellevue (WA) Fire Department. He has 35 years of experience in the fire service, and has served as chief in San Francisco and Las Vegas.

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Lindsay White, MPH, is a research assistant in the Medical QI section of King County Emergency Medical Services. She has been working in EMS since 2006. She is particularly interested in out-of-hospital cardiac arrest and the contribution of EMTs to the identification and management of chronic conditions.

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Hendrika Meischke, PhD, is a professor of health services at the University of Washington and very interested in the role of EMS in addressing public health needs.

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Mickey S. Eisenberg, MD, PhD, is medical director of King County EMS and professor of medicine at the University of Washington. He has been actively involved in studying and creating innovative programs to improve EMS for over 33 years.

people to the emergency department with hypertensive emergencies and discovered people with new-onset diabetes. In fact, according to satisfaction surveys from over 4,000 people screened, they were extremely happy with the EMS health advocates and the results they received. On a scale of 1-5, with 1 being poor and 5 being excellent, EMS health advocates were rated 4.9+ out of 5 for professionalism and 4.8 for their quality of work.

Screening participants are taking action to improve their health. Four fifths said they learned something they didn't know through the screening process, and only 6% said they didn't plan to do anything with the information they received. The rest (94%) planned to take action on or otherwise use the information they learned about their health in the screening process.

FLU SHOTS

By partnering with the EMS agencies, hospitals and insurers, Emed Health's health advocates have been able to vaccinate more than 10,000 people in the last year in clinics, hospitals and other sites around the city. Over 6,000 of these doses were administered to the special-needs populations (poor people or disabled people over the age of 65) of health insurers or flu clinics, and 3,800 were administered to nurses, doctors and other clinical staff through a roaming paramedic hospital program.

This roaming system was implemented because the hospitals had a vaccination rate of less than 40% among healthcare providers—a number that was even lower for ICU and emergency department staff because they were too busy to leave their units to attend free flu clinics. Medics delivered vaccines to personnel in eight hospitals. The hospitals saw increases in vaccination rates of almost exactly the number of flu vaccines given by the roaming paramedics, meaning the program likely captured people who would not otherwise have been vaccinated.

The program was well received by hospital staff, and there are plans to expand it. Studies have shown that vaccinating healthy workers saves employers \$42 per person vaccinated, but it probably saves much more in the hospital setting, where nursing shortages are bad, staff work in

close proximity with frequent exposure to the flu, and patients are at risk of contracting the flu from staff.

COMING NEXT

The next major initiatives on the horizon for Emed Health are programs for management of congestive heart failure, COPD and diabetes, secondary fall prevention and general chronic disease management, in addition to expansion of the current asthma management program. According to Paris, of the approximately 60 million people in the U.S. who have hypertension, about half are undiagnosed and will develop CHF, strokes and MIs. Finding these people through screenings and educating them before they develop complications makes sense.

According to Docimo, insurance companies are interested in working with companies such as Emed to help reduce the billions spent on manageable diseases. "With healthcare costs rising, the focus needs to be on keeping patients well instead of treating them when they're sick," she says. "We try to treat their problems before they reach the ED, because it's obviously a lot more expensive to treat people in the hospital than it is to keep them out of it."

In some states, legislation may be needed to expand EMS providers' scope of service. Nurses, physicians, insurers and others in the healthcare community need to be educated about the role EMS providers can play in reducing the nearly 120 million ED visits in the U.S. each year. Those who have seen Emed Health's program are convinced it can work.

"I'm optimistic," says Chris Dell, executive director of suburban Elizabeth Township Area EMS, "that there will be more paramedics and EMTs working with Emed Health and other programs to provide preventative healthcare."

Special thanks to Kelly Close, MD, MPH, Debra Lejeune, MEd, NREMT-P, and Katie Renze from Emed Health for their help.

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