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A Novel Emergency Medical Services-Based Program to Identify and Assist Older Adults in a Rural Community

Manish N. Shah, MD MPH^{a,b,c}, Thomas V. Caprio, MD^c, Peter Swanson^a, Karthik Rajasekaran^a, Joan H. Ellison^d, Kaaren Smith^e, Paul Frame, MD^f, Paul Cypher^g, Jurgis Karuza, PhD^c, and Paul Katz, MD^c

^aDepartment of Emergency Medicine, University of Rochester Medical Center, Rochester, NY

^bDepartment of Community & Preventive Medicine, University of Rochester Medical Center, Rochester, NY

^cDepartment of Medicine, Division of Geriatrics and Aging, University of Rochester Medical Center, Rochester, NY

^dLivingston County Department of Health, Livingston County, NY

^eLivingston County Office for the Aging, Livingston County, NY

^fTri-County Family Medicine, Cohocton, NY

^gThe Genesee Valley Health Partnership, Nunda, NY

Abstract

Rural-dwelling older adults experience unique issues related to accessing medical and social services. We describe the development, implementation, and experience of a novel, community-based program to identify rural-dwelling older adults with unmet medical and social needs. The program leveraged the existing emergency medical services (EMS) system. The program specifically included: 1) geriatrics training for EMS providers; 2) screening of older adult EMS patients for falls, depression, and medication management strategies by EMS providers; 3) communication of EMS findings to community-based case managers; 4) in-home evaluation by case managers; 5) referral to community resources for medical and social interventions.

Measures used to evaluate the program included patient needs identified by EMS or the in-home assessment, referrals provided to patients, and patient satisfaction. 1231 of 1444 visits to older patients (85%) were screened by EMS. Of those receiving specific screens, 45% had fall-related, 69% had medication management-related, and 20% had depression-related needs identified. 171

Corresponding Author: Manish N. Shah, MD MPH, 601 Elmwood Avenue, Box 655, Rochester, NY 14642, 585-463-2920 (office), 585-463-2966 (fax), manish.shah@rochester.edu.

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Swanson—data analysis, data interpretation, manuscript preparation

Rajasekaran—design, subject acquisition, data analysis, manuscript preparation

Ellison—design, subject acquisition, data interpretation, manuscript preparation

Smith—design, subject acquisition, data interpretation, manuscript preparation

Frame—design, subject acquisition, data interpretation, manuscript preparation

Cypher—subject acquisition, data interpretation, manuscript preparation

Karuza—design, data analysis, data interpretation, manuscript preparation

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of eligible EMS patients who could be contacted accepted the in-home assessment. For the 153 individuals completing the assessment, 91% of patients had identified needs and received referrals or interventions.

This project demonstrated that screening by EMS during emergency care for common geriatric syndromes and linkage to case managers is feasible in this rural community, although many will refuse the services. Further patient evaluations by case managers, with subsequent interventions by existing service providers as required, can facilitate the needed linkages between vulnerable rural-dwelling older adults and needed community-based social and medical services.

Keywords

Emergency medical services; Prehospital care; Screening tools; Geriatrics

Introduction

Despite frequent contacts with primary care providers(PCPs), older adults' unmet needs are often inadequately identified and addressed.^{1,2,3} Hypothesized reasons for this failure include factors at the patient-level (e.g. perceived stigma), provider-level (e.g. lack of training), and service system-level (e.g. inadequate time).^{4,5,6}

In rural communities, the problems are accentuated. The physician shortage limits older adults' access to PCPs.⁷ Geographic access barriers exist as patients face extended travel distances and times and difficulty in obtaining transport.^{8,9,10} Financial barriers, demonstrated by high poverty and lower insurance coverage exist.¹¹ These problems of identifying and addressing older adults' unmet needs require innovative approaches.

The prehospital, emergency medical services(EMS) system has not traditionally served a public health function, but holds significant potential.¹² It is staffed with trained providers, can evaluate patient issues in the context of their environment, and is available to everyone regardless of time, location, medical problems, or ability to pay. Even in areas with limited healthcare resources, EMS systems exist.

Some have proposed that EMS can identify and refer older adults with unmet medical and social needs while also providing emergency care.^{13,14,15,16} We believed that this model could be particularly valuable in our rural community because of the barriers accessing care and because of specific unmet needs previously identified.^{14,17} In this paper, we describe the application of this novel model of care in our rural community, and lessons that can be used by groups wishing to create a similar program.

Model of Care

Setting

Livingston County is a rural county in New York with 7,333 residents aged 65 years and older.¹⁸ In 2006, it had one small community hospital and 59 physicians. EMS consisted of 12 agencies, 11 with volunteer and one with paid staff, and cared for approximately 1000 older adult cases annually.

Planning and Developing the Program

A network of government and private social and medical service providers existed in the County to assist older adults. They collaborated together through the non-profit Genesee Valley Health Partnership (GVHP), as part of the GVHP mission was to develop new intake

and referral models to serve residents. Simultaneously, EMS agencies had worked on a project in which they screened older adults for vaccination deficits and falls.¹⁴ This experience led to collaboration under the GVHP to use EMS to identify older adults with unmet needs and refer these individuals to community-based medical and social providers for interventions.

This unique collaboration was led by four primary stakeholders: the Department of Health, the Office for the Aging (OFA), Tri-County Family Medicine, and the University of Rochester. The Department of Health and OFA were the largest providers of social and medical services, including case management. Tri-County Family Medicine was the largest primary care group. The University of Rochester participated in the community's EMS and public health efforts.

The group developed and refined the model of: 1) EMS screening; 2) referral of individuals for further assessment; 3) in-depth assessment by case managers (CM); and 4) referral by CMs for social and medical services. Basing the model in the EMS setting allowed inclusion of older adults who would have otherwise not received such services because they either were refused transport to the hospital or they were only cared for in the emergency department, which lacked these services.

To maximize participation and buy-in, the key program staff met with stakeholders, including the county medical society, physician practices, home health agencies, social service agencies, and EMS agencies. These meetings served to describe the concept and solicit program improvements ideas. We felt that this groundwork was critical to successful refinement and implementation. For instance, it was during these meetings that the PCPs requested that we directly provide referrals to service providers with PCP notification. These meetings have been continued to promote dialogue regarding the program.

Initial funding was obtained from the Health Resources and Services Administration Rural Health Outreach Grant Program.

Program Structure and Services

Organizational Structure—Figure 1 details the organizational structure. The Project Operations Committee held meetings weekly for 2 hours for the initial two years and then biweekly. The education and evaluation groups met every 6 months.

Two CMs were hired, a nurse and a social worker. Although only one CM actually performed the in-home evaluation, two different individuals with complementary skills were employed since they supported each other with their knowledge and abilities.

EMS Education—We recognized that because EMS providers received little geriatrics-specific education, they needed additional training.¹⁹ We provided the one-day *Geriatrics Education for EMS* (GEMS) course. Participation was enhanced because we made the courses convenient to EMS providers in terms of location and timing and because New York required EMS providers to obtain 3 hours of geriatrics education for recertification, which we provided. During the GEMS class additional training specific to the program and screening instruments were provided to improve the application of the instruments and the implementation of the program. Evaluation of this education program has been published.²⁰

EMS Screening—Community-dwelling older adults (age≥60) who accessed EMS for emergency care were first provided medical care and then screened across three domains--falls, depression, and medication management strategies (Figure 2). These domains were chosen by the primary stakeholders based on their prevalence, community concern, and

potential morbidity and mortality. We felt that this process of jointly determining the screening conditions was important to build support for and compliance with the program and reflect the community concerns. Six brief, literature-based screening questions were used to maximize feasibility. The falls questions asked if the patient had fallen in the past year or if the EMS provider identified any fall risks in the home.²¹ The Patient Health Questionnaire-2 was used to evaluate depression.²² Medication management questions evaluated if the patient takes more than 5 medications and if the patient had a pill taking strategy. The questions were then reviewed and pilot tested with EMS providers until the Operations Committee believed they could be used appropriately. The entire instrument could be completed in less than two minutes.

To maximize completion rates, we integrated the questions directly into the EMS medical record. Initially the record was paper-based, requiring the EMS provider to remember to answer the questions. Aggressive social marketing, including a newsletter, monthly meetings to discuss barriers, and trinkets with program information, was used to maximize compliance. The questions were automated when the EMS system converted to an electronic medical record system that prompted providers to answer the questions for eligible patients. EMS providers also gave patients a card describing the program.

Communication of Findings—Project staff obtained the demographic information and screening results and entered them into a data management system. Initially, a Microsoft Access database was used. We transitioned to a web-based product (PeerPlace, Rochester, NY) because it also provided significant operational efficiencies. The CMs then accessed the database to identify patients needing to be contacted, to record the evaluation findings, and to record and transmit referrals. The advantages of using the electronic record system were that it allowed: 1) the program to operate without a central office; 2) CMs to access records remotely; and 3) automated reminders. Additionally, because these databases recorded the program's activities, program evaluation was simplified.

Case Management—Under the initial grant, all patients screened by EMS were offered a free in-home visit from a CM if they continued to live in the community (not institutionalized). We included all patients, regardless of EMS findings, to gain experience and to evaluate and potentially revise the conditions for which EMS screened. Now, the process has been streamlined and the CMs only offer home visits for individuals with EMS-identified needs.

The CM attempted to make phone contact 2 weeks after the EMS call. If contact could not be made 4 weeks after the EMS call, the case was closed. Prior to the home visit, the CM obtained verbal consent to contact the patient's PCP to obtain a current medication list and problem list. During the home visit, the CM evaluated each patient in the following domains: vaccinations, advanced directives, formal and informal support services, nutrition, activities of daily living, instrumental activities of daily living, depression, alcohol abuse, drug abuse, falls, cognition, medication management strategies, home environmental safety. The evaluation for most of these domains consisted of available validated measures, such as the Patient Health Questionnaire-9. Visits usually lasted between 90-120 minutes.

After completing the evaluation, the CM made recommendations for referrals. Based upon the patient's desires, the CM then made referrals directly to service agencies. We believed that by making the referral directly we eliminated a potential barrier to access—the patient calling and communicating his/her needs. If the services required medical authorization, the CM worked with the patient's PCP. A standardized summary letter was sent to the PCP detailing the CM's findings and actions taken. The letter included a complete medication list based on the CM's review of the medications the patient was actually taking.

Sustainability

The grant funding was used to develop and refine the structure and to evaluate the program, particularly since this type of program in a rural community had not been described in the literature. Upon completion of the grant, the program was transitioned into one that could be sustained and continues operation. Ongoing funding was provided by the GVHP and the OFA. Only essential program components were retained to maximize service delivery. The Community Oversight Board, a volunteer group, was retained. The Project Oversight Board, Education Committee, and Evaluation Committee were eliminated. EMS training was transitioned to EMS leadership, which provided those services regularly using other funding streams. The Operations Committee was reduced to the GVHP director providing administrative oversight. The EMS screening was unchanged as it was completed as part of EMS providers' usual duties and incurs no additional costs. We retained the CM review of screening results and performance of in-home assessments, but eliminated the follow-up and satisfaction surveys.

Costs

The primary costs to establish the program were database development and community outreach. The on-line database was quite expensive, but provided operational efficiencies that were worth the initial investment. To engage the community and develop the program, we estimate that we spent over 100 hours interfacing with providers, mostly by the CMs. Any group attempting to create a similar program will need to expend similar efforts.

For the sustained program (i.e. required elements), we estimated that for each patient receiving a home visit, the CMs required an average of 4 hours of effort, including phone calls, driving, patient contact, and paperwork. An administrative assistant spent approximately 0.25 hours per patient visited. Because the CMs and administrative assistant were independent contractors, they were only paid based upon time worked. We incurred additional costs under the grant due to the untested nature of this model, but those wishing to create a similar program should not have to bear those costs.

Evaluation

Our evaluation was structured around pre-post testing of the educational intervention (published elsewhere), process measures of services delivered, and satisfaction surveys.²⁰ The research evaluation plan was approved by the University of Rochester IRB. The program's operation was evaluated between April 2006 and December 2007. The program's records, including EMS screening, CM phone calls, CM in-home assessments, and CM referrals were abstracted from the electronic database managing the program. Individuals who completed the in-home assessments were contacted via telephone to assess their satisfaction with the program. Three options existed: not satisfied, neutral, satisfied. The program was characterized using descriptive statistics.

Evaluation Results

During the 18-month period, EMS had 1,444 older adult patient visits and successfully completed at least part of the screening instrument on 1231 (85%). The average age of screened patients was 80 (standard deviation 7.9) and 844 (58%) were female. The proportion of older adults successfully screened for the domains varied, with depression being successfully evaluated on 728 (59%) of patients, falls on 814 (66%), and medication management strategies on 950 (77%) of patients. Of those receiving specific screens, 240 (33%) screened positive for depression (PHQ-2), 552(68%) were at risk for falls (fall during past year or environmental risk identified), 852(90%) were at risk for medication management problems (>5 medications or no pill taking strategy).

Of the 1231 individuals screened by EMS, we were able to contact 635 (52%) who were alive and not in a health care facility. 464(73%) refused, with reasons provided including not being interested (213, 47%) and denial that problems existed (182, 41%). 171(27%) accepted a home visit and 153 successfully completed the visit (Figure 1). The large proportion of patients who could not be contacted or who refused a home visit is important to note.

The characteristics of those who completed the in-home assessment, the findings of the in-home assessment, and the referrals that were recommended or provided from the in-home assessment are detailed in Table 1. Examples of unmet needs identified ranged from vaccinations (12-16%), depression (13%), medication management (26%), and falls (54%). Referrals and interventions included education (16%), social service referrals (25%), and PCP referrals (52%). Patients refused 6% of referrals.

We successfully completed the follow-up telephone survey with 130 individuals and 119 (92%) of them reported satisfaction with the overall program. Specific domains that were queried included satisfaction with CM follow-up (90%) and with CM responsiveness (96%).

Discussion

This program created an organized system in which EMS could augment the public health activities for older adults in a rural county by identifying older adults with unmet needs and then referring to a case manager. It carefully considered the requirements to be successful in this rural community: education of EMS providers, evaluation of older adults using structured instruments, referral to community service agencies, and delivery of services. The program provided the first three requirements. Initially, the program had been prepared to fund limited services, but we found that sufficient community resources were available, just not always linked to those needing services.

This program had excellent collaboration and communication between EMS, CMs, and service delivery organizations, which had never previously existed. Through this collaboration, and the communication that it supported, patients with identified needs, whether they were identified by EMS or the CMs, were directly linked to services. Furthermore, the communication extended to input regarding improvement of the program and the actual services delivered by community agencies. Ultimately, we believe that this collaboration and communication supported maximal evaluation and delivery of social and medical services.

This program successfully identified a significant number of individuals with unmet needs (Table 1). For some older adults, EMS is a safety net and provides their only contact with the health care system. The case management added a complementary follow-up to this EMS-based screening by facilitating needed linkages between vulnerable rural-dwelling older adults and social and medical services. This project enabled older adults to have improved access and greater awareness of services in their community and could serve as a core component of a larger single point of entry model for obtaining information and access to services. Although we could not demonstrate patient-level outcomes, we were able to show that patients receiving home visits were satisfied with the program and new clinical information was provided to PCP offices which previously was never available.

EMS could have screened for other conditions, such as vaccination deficits, but those identified were felt to be the most important by the primary stakeholders. The advantage of this model is that the screening items can be altered easily to respond to any local needs.

We identified four major challenges with the program. First, a large proportion of patients refused the in-home assessment because they felt they did not need assistance or could not be contacted for the assessment. Approaches are needed to decrease this refusal rate to maximize the community impact. Second, the generalizability of this model is unknown. Whether it would work in urban or suburban areas needs further evaluation. Third, the screening instruments used by EMS have not been validated in the prehospital, EMS setting. Thus, the validity of screening results and the meaning of the screening results are unclear. Fourth, the in-home assessment model used to evaluate the older adult patients and identify unmet needs is time consuming and have yet to be proven to improve health outcomes. An outcomes-based evaluation needs to be performed with sufficient sample size.^{23,24} Finally, sustainability has been a major challenge. Broad, single point of entry systems are only now developing nationally and require some organization and staffing. New York State has been supporting the development and implementation of single point of entry, which has been a benefit to the sustainability of this program.

For groups wishing to create a similar program, we recommend that the first year be allocated to working with community stakeholders to identify screening elements, building the stakeholder support, identifying community resources, and establishing program processes. This will be time consuming, but will require less time effort as the program continues and, in our opinion, will improve the acceptance and operation of the program. We further recommend using staff with other responsibilities or staff members who are independent contractors as this program will likely not have sufficient volume to keep one individual busy in a rural community. We strongly recommend using technology such as electronic records systems to improve efficiencies, as long as the technology can work in the rural community.²⁵ Finally, we recommend working with the community to identify barriers to accepting in-home visits so that the acceptance rate could be improved.

Conclusion

This project demonstrates that home-based screening by EMS for common geriatric syndromes and involvement of transitional CMs is feasible, can identify a number of individuals with unmet needs, and can refer or provide interventions for those with needs in a rural community. However, a large proportion refused to participate or were unavailable for follow-up. This type of screening is promising for the future expansion of the role of prehospital care providers in public health and this program offers the potential to expand community access to services and may serve as a core component of a larger single point of entry model for information and access to services.

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Figure 1. Organizational Structure

Figure 2. Program Model and Patients Between April 2006 and December 2007

Table 1
Findings on Home Visit and Referrals Provided

(N=153, unless indicated)

Findings		Value
Age, average (standard deviation)		79 (7.8)
Gender, Female		90 (59%)
Race	White	151 (99%)
	Black	2 (1.3%)
Ethnicity, not Hispanic		151 (99%)
Education	No high school diploma or GED	45 (29%)
	High school diploma or GED	63 (41%)
	College degree or more	40 (26%)
	Unknown or Not answered	5 (3%)
Have had the influenza vaccine this year? (n=148)	No	23 (16%)
	Yes	78 (53%)
	Visit not during influenza season	47 (32%)
Had the pneumococcal vaccine ever? (n=149)	No	18 (12%)
	Yes	117 (79%)
	Unknown	14 (9%)
Have an advanced directives form? (n=149)	No	72 (48%)
	Yes	67 (45%)
	Unknown	10 (7%)
Have a Health Care Proxy? (n=149)	No	50 (34%)
	Yes	93 (62%)
	Unknown	6 (4%)
Nutritional risk (by NSI, n=146)	Good (0-2 points)	39 (27%)
	Moderate risk (3-5 points)	80 (55%)
	High risk (≥ 6 points)	27 (18%)
ADL deficiencies, average (standard deviation)		1.53 (3.6)
IADL deficiencies, average (standard deviation)		6.2 (5.3)
Depressive symptoms (PHQ-9 ≥ 10 , n=135)		17 (13%)
Alcohol abuse risk (Michigan Alcohol Screening Test-Geriatrics ≥ 2 , n=143)		7 (5%)
Drug abuse risk (Drug Abuse Screening Test-10 >0 , n=143)		2 (1%)
Cognitive Impairment (Six Item Screener > 2 errors, n=143)		15 (10%)
Fall during past year		83 (54%)
Fall related environmental risks		71 (46%)
General Environmental Concerns	Garbage not managed	1 (0.65%)
	No carbon monoxide detector	39 (25%)
	No smoke detector	13 (9%)
Needs related to medications (assessed by Case Manager, n=147)		38 (26%)

Findings		Value
Medication related troubles (n=146)	Paying for medications	13 (9%)
	Handling medications	19 (13%)
	Reading Instructions	22 (14%)
Pill taking strategy (n=144):	Pill box	89 (62%)
	None (bottles, shoe box, on table)	51 (36%)
	Staff administers	4 (3%)
Referrals / Interventions		Value
Patients receiving referrals		139 (91%)
Referrals made		606
Referral Issues	Activities of Daily Living	19
	Advanced Directives	68
	Alcohol Abuse	5
	Cognitive Impairment / Memory	5
	Mental Health / Depression	70
	Drug Abuse	1
	Falls	124
	Home Environment	42
	Instrumental Activities of Daily Living	33
	Medication Problems	45
	Nutrition	69
	Vaccinations	53
	Other	72
Referrals / Interventions Provided	To Primary Care Physician	316 (52%)
	To Social Service Agency	153 (25%)
	Patient Refused / Deferred	38 (6%)
	Education Only	99 (16%)

Note: NSI=Nutrition Screening Initiative; ADL= Activities of Daily Living; IADL= Instrumental Activities of Daily Living;