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A Novel Internet Based Geriatric Education Program for Emergency Medical Services Providers

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Abstract

Despite caring for large numbers of older adults, prehospital emergency medical services (EMS) providers receive minimal geriatrics-specific training while obtaining their certification. Studies have shown that they desire further training to improve their comfort level and knowledge in caring for older adults. However, continuing education programs to address these needs must account for each EMS provider's specific needs, consider each provider's learning styles, and provide an engaging, interactive experience. We developed and implemented a novel, internet-based, video podcast-based geriatric continuing education program for EMS providers and evaluated their perceived value of the program. They found this resource to be highly valuable and were strongly supportive of both the modality and the specific training provided. Technical challenges were reported by some as a barrier, as well as the inability to engage in a discussion to clarify topics. Both were felt to be addressable through programmatic and technological revisions. This study demonstrates the proof of concept of video podcast training to address deficiencies in EMS education regarding the care for older patients. However, further work is needed to demonstrate the educational impact of video podcasts on the knowledge and skills of trainees.

Keywords

Emergency medical services; Prehospital care; Education; Geriatrics

BACKGROUND

Prehospital, emergency medical services (EMS) providers experience many challenges caring for the older adults who differ significantly from younger patients.¹ Despite the

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unique circumstances specific to this population, including comorbidities, polypharmacy, and communications barriers, EMS providers receive little geriatrics-specific training. Most emergency medical technicians (EMTs) only receive 1 hour of geriatrics training and paramedics receive only 4 hours.² The impact of this lack of training was reflected in studies that found EMS providers are uncomfortable caring for older adults and perceive a significant deficit in their education related to the care of older adults.^{3,4}

This discomfort by EMS providers is alarming given that patients age 65 comprised 38% of EMS patients in 2000 and by 2030 older adults will likely comprise one-half of EMS cases.^{5,6} With the growth of the geriatric population, their high use of EMS, and the population's complex needs, there is a compelling need to ensure that EMS providers have the proper knowledge and skills to address the unique medical and psychosocial needs of this demographic group.

A previous study found discordance among EMS providers regarding the best method to address the deficiency in geriatrics training. Some preferred independent training via internet-based self-study modules that could be accessed while on duty, while others preferred traditional classroom-based didactic training.³ This variety in preferences reflects the overall diversity of EMS learners, who hail from varied backgrounds, particularly compared to the traditional student, have multiple jobs, and have different levels of education. Meeting this group's needs requires using multiple educational resources, considering each student's ideal learning style, and providing an engaging, interactive experience.

Based on formative work and the presence of a didactic educational program (the American Geriatrics Society-sponsored *Geriatrics Education for EMS*), we developed an online, video podcast-based training program to address the need for geriatrics-specific education for EMS providers. This article describes the development and implementation of the novel training program and the EMS community's perceived value of the program, thereby demonstrating proof of concept for this program. Furthermore, this article summarizes the lessons learned while developing the program.

EDUCATIONAL PROGRAM

Setting

This program was developed at the University of Rochester. We targeted EMS providers who practice in a two-county region around Rochester, NY that includes urban, suburban, and rural areas. In 2008, approximately 3,000 EMS providers resided in this region. Continuing medical education (CME), including geriatric topics, is traditionally provided through lectures by EMS agencies, hospital outreach programs, or regional EMS organizations.

Selecting a Training Mode

Based on work identifying the deficits in geriatric training, the learning styles of adult students, and preferences of local EMS providers, we recognized that the ideal educational content should be: 1) presented by experts in the topics and recognized opinion leaders; 2) free to EMS providers; and 3) flexible in its availability.^{3,7} This flexibility was felt to be critical due to the highly irregular work schedules of the learners. For volunteer EMS providers, training is a significant burden since they must allocate their free time to participate. For paid EMS agencies, training is a financial burden since they must pay employees to attend programs. However, while EMS providers are on-duty and waiting to go to 911 calls for assistance, there is the opportunity to participate in continuing education.

Given the priorities identified, we decided that online training in the form of video podcasts would be ideal. Video podcasts offer the ability to: 1) play on demand; 2) be repeated if interrupted; and 3) have consistency in content and expertise. The video podcasts can be used as part of a didactic session or independently. The value of internet-based training is further supported by studies that demonstrated that computer delivered content meets the need of a service that must have a flexible training schedule and is equal to traditional classroom based learning.^{8,9,10}

Barriers to video podcasts were also recognized. The training media must be created, the experts must be recruited and interviewed on video, and the recording, editing, and publishing of the training material can be laborious and expensive. Studies have shown that learners, particularly mature learners, struggle with the technology associated with accessing podcasts.^{11,12,13} Finally, while the ideal educational program is interactive, video podcasts can be a passive experience.

Planning and Development

To create the training, a development team of geriatricians, emergency physicians with EMS specialization, EMS providers, and education experts was established. This team oversaw the entire program and developed the curriculum (Table 1), which consisted of 11 “blocks.” Within each block were four “episodes” that contained related content. The targeted maximum length for each episode was 11 minutes. This length was chosen because of CME credit guidelines, YouTube posting requirements, and the average adult’s attention span.¹⁴

The development team decided that rather than having a traditional didactic seminar, experts would be asked to deliver the content in a more dynamic and personalized manner, such as through an interview type format. Tangible relevance was added by interviewing EMS providers to provide practical expertise. To do this, learning objectives and a question guide were provided to the individual being interviewed.

The development team also established a structure for the video podcasts to reinforce learning objectives. Each episode’s podcast opened with list of 3–5 objectives. Then, edited interviews with experts taught to the first objective. When the material for the objective was complete, the key information related to that objective was re-reviewed in the form of text on a slide. This pattern was repeated for all objectives. Finally, at the end of the podcast, the episode’s original objectives were re-reviewed in the form of text on a slide. To meet CME requirements and cement knowledge, a test was created to emphasize the learning objectives and query mastery of the core content.

We explored using professional videographers to record and edit the interviews, thinking that producing professional-quality videos would have more impact. However, their expense and lack of knowledge regarding content were problematic. Thus, we handled the recording and editing under the guidance of the development team by employing a medical student with a background in videography and a college graduate-EMT. This resulted in high-quality video podcasts that required less guidance than a professional company with no experience. This also demonstrated the feasibility of developing the video podcasts in-house at reduced cost.

After the staff created a draft version of the video podcast episode, it was reviewed by the development team to ensure accuracy of content and quality. Once the entire block of four episodes was finalized, it was “published” on the web (www.mlrems.org) as a streaming or a downloadable QuickTime file. Additionally, it was published on YouTube (RochesterEMSchannel). Links for the videos were placed on EMS training sites and it was

publicized locally among EMS leaders, educators, and providers. EMS providers could use video podcasts individually or in the classroom setting.

CME Credit

In New York, EMS providers who recertify through a CME program must complete 3 hours of geriatrics training. To receive such credit, a post-test must be completed. Thus, an EMS educator reviewed each episode and developed a post-test consisting of approximately 5 questions based upon the episode's objectives. To receive CME credit, the EMS provider was required to complete view an entire block, complete all 4 quizzes in a content-block, and answer at least 80% of the questions on each test correctly. There was no limit on how many times a provider could take the test.

The post-test also included two satisfaction questions and an open ended question requesting comments regarding each episode so that we could ensure our video podcasts were maximally beneficial to EMS providers.

Sustainability

Initial program funding was provided by the University of Rochester-based Finger Lakes Geriatrics Education Center of Upstate New York, a Health Resources and Services Administration-funded organization. The grant paid for the an Apple computer, a home video camera, and the Final Cut Pro (Apple, Cupertino, CA) software package. Once we became experienced at creating video podcasts, we estimated that each block of four 11 minute episodes required:

- Two hours (unpaid time) from experts interviewed for the episodes.
- 10 hours from development team members to create objectives, create interview questions, review and comment upon draft versions of the video podcasts.
- 3 hours from an EMS educator to write post-test questions.
- 40 hours from a staff person to record, edit, and publish the video podcasts.

Program Evaluation

The program evaluation had 2 main objectives: 1) characterize the use of the video podcasts and 2) assess the opinions of the EMS providers regarding video podcasts as an educational resource.

Study Design—We performed a retrospective review of qualitative and quantitative data collected as part of the post-tests for each block between December 1, 2008 and October 31, 2009. During the evaluation period, six blocks consisting of four episodes each were available. The institution's research subjects review board approved this study.

Protocol and Analysis—When any EMT or paramedic completed a video podcast block and wished for CME credit, they completed a post-test. We abstracted variables including episode/block number, date episode published, views on YouTube, participants, proportion passing the post-test, and qualitative answers to satisfaction questions. Quantitative data were analyzed using descriptive statistics. Qualitative data were analyzed by the study team according to our three domains of interest: 1) technical aspects, 2) educational value, 3) future suggestions. Coded data were arranged into basic themes that were developed iteratively as coding occurred. All coded statements were reviewed by the study team for consistent and accurate categorization, and discrepancies were reviewed together and resolved by consensus. As per qualitative analytical techniques, more specific coding categories were created based upon themes that emerged from the data.

RESULTS

EMS providers accessed the training as described in Table 1; 472 blocks were completed with 448(95%) passing the post-test. We found 6,066 YouTube views, exceeding our expectations. The greatest number of YouTube views and requests for CME credit were for the oldest video podcasts, but the episode “Evaluating Mental Status Changes” had 1,518 views, almost four times greater than any other episode.

Of the 472 post-tests submitted, 123 included at least one comment. The comments were grouped into six themes within the three analytical domains (Figure 1). Below, each of the analytical domains and themes are discussed in detail.

Domain 1: Technical

Two themes were identified in this domain, with their main focus referring to the program's technical aspect.

Ease/Access/Opportunity—Comments in this theme were indicative of the ease of accessibility and opportunity for providers, and are represented by comment 1-3 (Table 2). Generally the online format offered more opportunity to providers to receive education on geriatrics, increased the provider's access to information, and made the access and opportunity easier for providers to obtain.

Barriers—Barriers identified referred to technical components hindering use of the program. The most common barriers noted were sound and download challenges (comment 4, Table 2).

Domain 2: Educational Value

Three themes related to the educational value of the program were identified.

Program Overall—This theme related to the overarching impact of the program. Comments were positive and indicated a high quality of the program and high value to the EMS providers (comments 5-7, Table 2).

Video Podcast Content—This theme was identified from comments regarding the specific content in the video podcasts. Both positive and negative comments were noted. Positive comments related to providers learning from the video podcasts. However, specific instances of topics that remained confusing, particularly one episode that was very complicated, were highlighted (comments 8-9, Table 2).

Post Test—Negative comments in this theme were attributed to one specific post-test. Otherwise, EMS providers felt that the tests were reasonable (comment 10, Table 2).

Domain 3: Future Content

Future Content—EMS providers had numerous future content suggestions. Many comments related to other age groups and non-geriatric topics (comment 11). However, some comments, such as a request for cardiology training were topic appropriate (comments 11-12, Table 2).

DISCUSSION

“Anywhere, anytime, anything” is touted as an EMS mantra. Ideally, prehospital provider education would match this philosophy as it reflects the broad spectrum of content EMS

providers must master, their scheduling limitations, and their varied learning styles.⁷ Our goal was to create a training opportunity that addresses these challenges by using a widely accessible educational modality, the video podcast, to address a critical deficiency in EMS providers' education.

This training program was extensively used by EMS providers, with 448 hours of CME credit provided and 6,066 YouTube views during 11 months. Although we were unable to track unique views, these metrics do represent a high level of use, demonstrating demand for and support of the program as well as proof of concept for this program. This is not surprising because flexible formats such as video podcasts, blogs, and Wikis are becoming the increasingly accessed and popular formats in teaching.¹¹ Podcasts are particularly valuable as they allow learners to control access to the material; enhance their existing knowledgebase; and allow for repetition to support understanding.¹³

EMS providers' comments also indicated that they highly supported the program as a means to obtain training. They found video podcasts easier to access and compatible with their schedules and the podcasts were judged excellent and generally easily understandable. Technical challenges, such as sound problems, were noted. Some resulted from unavoidable software and hardware incompatibility issues. Our use of streaming media and YouTube generally resolved these issues. One potential improvement to podcast curriculum is to assure technical support and education for those who may be uncomfortable with the modalities. Another complaint was that because there was no live instructor, no one could answer questions or clarify topics. While this is a limitation of this training model, a potential solution is to build a collaboration capability into the platform (e.g., a live blog) that would allow for a discussion. While the discussion timing may be discordant with the learners reviewing the podcast, it would be available for all to see at their convenience.

Enthusiasm by EMS providers for these educational video podcasts could be related to either the modality which resulted in improved accessibility or the content which met a curricular deficit. The comments received imply that both reasons for support are valid. We found requests for podcasts on non-geriatric topics, while other comments provided strong positive feedback regarding the geriatrics knowledge provided. Thus, educators should consider using this modality to train EMS providers in non-geriatric topics and should consider using this modality to train other groups in geriatrics principles.^{15,16}

For groups wishing to create a similar program, we recommend creating a multidisciplinary development team that maps out the goals, educational topics, and educational objectives before implementing a podcast. Creating a portion of the podcast that requires engagement, such as a discussion group or a knowledge test, may be valuable for knowledge retention; however we did not assess this item. We further recommend partnering with local educational and health care organizations to obtain experts who can be interviewed and technical videography staff.

The evaluation of this program did have limitations that must be recognized. First, we did not measure how much of the geriatrics knowledge was retained and integrated into clinical practice as this demonstrating the educational power of this intervention was not our aim. Future studies will be needed to assess this question. Second, we cannot confirm that trainees actually watched the video podcasts in their entirety. Future programs can use software to confirm this. However, in this program 95% of tests submitted met the passing threshold, thereby confirming a basic knowledge acquisition of the geriatrics content.

Conclusion

An internet-based, video podcast-based geriatric education program for EMS providers is a valuable resource for CME. EMS providers who have barriers to accessing training were strongly supportive of this modality and the geriatrics-specific training it provided. Video podcast training should continue to be considered to address deficiencies in EMS education. Further work is needed to demonstrate the educational impact of this novel education intervention in the clinical outcomes of the students.

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Figure 1.
Interconnectedness of Themes and Overarching Domains

Table 1

Training Content, Frequency of Material Access, and Post Test Performance

Block	Release Date	Youtube Views	Score (average %)	Pass / Fail
Block 1 - Communication	11/2008			117 / 12
<i>Hearing Loss</i>		395	91	
<i>Aphasia</i>		385	87	
<i>Communicating with Respect</i>		184	90	
<i>Communicating at SCFs</i>		197	89	
Block 2 - Polypharmacy	11/2008			80 / 27
<i>Medication History</i>		420	85	
<i>Medication Compliance</i>		227	73	
<i>Polypharmacy</i>		213	73	
<i>Medication Toxicology</i>		212	77	
Block 3 - End of Life Issues	12/2008			75 / 5
<i>Advanced Directives</i>		144	91	
<i>Healthcare Proxies</i>		112	87	
<i>Hospice and Palliative Care</i>		128	87	
<i>EMS and Caregiver Stress</i>		236	94	
Block 4 - Assessment	1/2009			42 / 25
<i>Evaluating Mental Status</i>				
<i>Change</i>		1518	73	
<i>Evaluating Stroke</i>		176	76	
<i>Evaluating Falls</i>		143	71	
<i>Top 5 Physical Signs</i>		178	67	
Block 5 - Psychosocial Issues	2/2009			56 / 6
<i>Elder Abuse and Neglect</i>		201	90	
<i>Aging and Psychology</i>		145	84	
<i>Transport Barriers</i>		78	91	
<i>Assessing Social Services</i>		78	86	
Block 6 - Procedures	2/2009			16 / 11
<i>Backboarding</i>		118	90	
<i>IV Access</i>		172	73	
<i>Airway Management</i>		342	55	
<i>Treating Hip Fractures</i>		64	92	

Table 2

Sample Comments

Comment number	Theme	Analytical Domain	Illustrative Comment
1	Access/opportunity	Technical	<i>"From my perspective it is easier! I do appreciate the effort to make didactic more readily available."</i>
2	Access/opportunity	Technical	<i>"Easy access: I have had to go back to listen again and review a specific episode a couple times to understand it better. It is very easy to return to each episode for review"</i>
3	Access/opportunity	Technical	<i>"it makes life much easier to be able to complete the required CME's online"</i>
4	Barrier	Technical	<i>"My computer replayed in a very small picture frame 1 "x3/4" not sure me or you? Used Quicktime"</i>
5	Program Overview	Educational Value	<i>"Nice concept, thank you"</i>
6	Program Overview	Educational Value	<i>"The topic itself: We have many geriatric patients, so need frequent review of problems that we could encounter taking care of older people. It has been a good review for me"</i>
7	Program Overview	Educational Value	<i>"It's nice to have CME's directed at EMS providers not Doctors"</i>
8	Video Content	Educational Value	<i>"had good information that I have not seen in a long time"</i>
9	Video Content	Educational Value	<i>"A bit confusing"</i>
10	Post Test	Educational Value	<i>"Post Test is easy to access, easy to read, consistent layout for all tests, and 1 page long."</i>
11	Future Content Suggestions	Future Content Suggestions	<i>"A topic that I have found hard to get is OB/GYN. I would like to see some pod casts."</i>
12	Future Content Suggestions	Future Content Suggestions	<i>"Enactment of technique would be effective"</i>