

The Digital EMS California Academy of Learning: One State's Innovative Approach to EMS Fellow Education

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ABSTRACT

Introduction: Emergency medical services (EMS) fellowships are growing in significance within the United States prehospital health care system. While fellowships represent a cornerstone of EMS subspecialty education, an individual learner's experiences are limited by local resources and practices. California EMS fellowships have developed an innovative method for expanding fellows' educational experiences outside their immediate programs.

The Innovative Education Method: Each month, fellows, fellowship directors, and local EMS medical directors from throughout the state participate in a video conference. This meeting is divided into four distinct components: book chapter presentation, board-style question review, call review, and an EMS literature review.

Chapter Review: The two-volume text *Emergency Medical Services: Clinical Practice and Systems Oversight* has been categorized into 12 modules, one for each month of the fellowship. Every meeting, one fellow prepares a didactic presentation summarizing the highlights from that month's chapters.

Question Review: Fellows each create five multiple-choice questions and answers, based on the section reading. Questions are assessed by the group, both for informational content and for appropriate formatting. After completion, these questions are submitted for future review for the EMS fellowship in-service examination.

Call Review: Based on that month's module topics, a call is chosen and reviewed. Regional protocol and practice differences from different systems are discussed. The online medical oversight provided and the prehospital provider performance are evaluated by the group.

Literature Review: Fellows not assigned to present a call or didactic segment each choose one paper focusing on a subject relevant to the module or call. Strengths of the study design, analysis, outcomes, and relevance to EMS practice are discussed.

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Outcomes: Fellows and experienced EMS attendings are exposed to different protocol and system approaches in an interactive and accessible format. This partnership expands educational opportunities for fellows and promotes collaboration across EMS systems.

NEED FOR INNOVATION

The number of fellowships providing subspecialty training in emergency medical services (EMS) has grown over the past decade.^{1,2} During training, time, and resource limitations generally constrain the exposure of fellows to their local educators and practice environment. The resulting experience provides an appreciation of fundamental EMS principles but may hinder a broader understanding of variations within the field.^{3,4} Geography and faculty composition can also limit opportunities for mentorship, professional development, and deeper exploration of academic interests that are not immediately available in the training location.

BACKGROUND

Emergency medical services became a recognized subspecialty of the American Board of Emergency Medicine in 2010. Formal accreditation of EMS training programs in 2013, with a defined core curriculum and body of knowledge, transformed what was previously an on-the-job learning process into a more standardized educational experience.^{5,6} While national developments have been successful in advancing EMS medicine in many regions, fellowship education remains subject to variations, often due to differences in local expertise, resources, and program objectives.

Remote learning has been used effectively in training for prehospital providers,^{7,8} and literature suggests utility and success with use in graduate medical education.^{9,10} Given the limitations fellowships face in ensuring complete coverage of the curriculum, video conferencing offers an opportunity to expand understanding of other systems' practices, structure, successes, and challenges.¹¹ Additionally, teleconferencing removes barriers of physical distance or limited space, allowing larger numbers of participants, from wide-ranging geographic locations additional opportunities for engagement and collaboration.⁹

OBJECTIVE FOR INNOVATION

The objectives were to expand the education of EMS fellows to systems outside of their local areas and to

expose learners to additional mentors with personal and academic foci that may align more optimally with their own, regardless of institutional affiliation or geographic location.

DEVELOPMENT PROCESS

The concept of a consortium originated when two EMS fellowship programs in California decided to collaborate on a structured educational experience, and a monthly video teleconference was begun. Northern California programs discovered that they were providing similar modular curricula but were seeking opportunities for broader ideas exchange. Within a year, all of the EMS fellowships in California had joined what would become the Digital EMS California Academy of Learning (DECAL). Since that time, the California EMS fellows learn about their local system and benefit from exposure to a diversity of systems and faculty from across the state.

The Structure

Each month, fellows, fellowship directors, and local EMS medical directors from each of California's five programs (University of California at San Diego, University of California at San Francisco, University of California at Los Angeles [Harbor-UCLA], University of Southern California, and Stanford University) participate in a 4-hour video conference. On a rotating basis, each fellow, with oversight from his or her faculty, is responsible for preparing material pertaining to one of four educational components: book chapter presentation, board-style question review, prehospital radio call review, and EMS literature review.

Chapter Review. The two-volume text *Emergency Medical Services: Clinical Practice and Systems Oversight*¹² is divided into 12 modules. One fellow prepares and delivers a 30-minute presentation summarizing key points from that month's reading. Differing practice patterns, controversies in EMS, and current issues as they relate to the topic are interspersed throughout the talk.

Question Review. Fellows each create five board-style multiple-choice practice questions and answers based on that month's reading. Questions are assessed and edited by the group for content and style. After

completion and final editing, the questions are contributed to a national question bank¹³ for preparation for the EMS qualifying examination.

Call Review. One fellow selects a base hospital call from his or her local EMS system that is aligned with the month's topics. The radio contact is reviewed by the group, and protocol and practice variations among the different systems represented are discussed.

Literature Review. Remaining fellows choose one journal article focusing on a subject relevant to the module. Strength of the methods, analysis, and outcomes are discussed by the group. Studies are typically selected from recent publications or from influential studies.

Technical Support Details

Participants from multiple locations use a teleconferencing system that allows for either video conferencing or audio only. Several teleconference systems allow for Mac, PC, landline, and smartphone users. The Consortium uses Skype. The product used was chosen for its familiarity among users as well as the abilities to share electronic materials and audio-record the conferences. This instrument is relatively user-friendly, free, and generally of high quality. Technical challenges occasionally occur, including streaming issues, poor quality audio or video, local Internet connectivity, and dropped calls. Encouraging participants to silence their lines while not speaking has improved some of the audio issues. High Internet speeds and strong connections are crucial for decreased interruptions during the consortium.

OUTCOMES

For 3 years, EMS fellows, program directors, and associated faculty and residents have expanded understanding of statewide variations in EMS practice through DECAL. In addition to exposing fellows to a range of EMS practices, this regular teleconference has sparked research collaborations, an educational podcast,¹⁴ and an expanded mentoring network.

Appreciating EMS Practice Differences

Discussions of practice patterns provide opportunities for fellows to consider factors that drive differences between EMS systems. Several levels of EMS service and regulatory bodies are represented at the teleconferences, including some of California's most populous

counties and cities and a range of provider services. The communal nature of the meetings allows for a more in-depth look at site-specific needs and open dialogue between directors and fellows.

Creative Collaborations

Digital EMS California Academy of Learning provides an informal setting for cross-pollination of ideas and for formation of creative partnerships. Using the teleconferencing platform, fellows can remotely contribute to projects created through the consortium. By pooling the collective resources of the group, collaborators have a higher likelihood of success in their research endeavors. Fellows can also establish multi-institutional partnerships early on and can improve both the quality and the impact of their individual work.

Broadening Mentorship and Networking Opportunities

The consortium expands the networking, mentorship, and sponsorship available to fellows. Most EMS fellowships accept only one or two fellows per year. DECAL broadens a fellow's network of contemporaries and others with aligned interests. The large number of participating physicians and the range of mentors also increase the likelihood that a fellow from an underrepresented group within EMS (such as by sex, race, or sexual orientation) can connect with someone who understands the unique challenges faced in his or her career.

REFLECTIVE DISCUSSION

Since its inception, the consortium has refined its format to adapt to the changing needs of its participants. Delineation of presenter roles and responsibilities has improved the efficiency and depth of the educational experience.

One challenge faced by DECAL is the relative homogeneity of the clinical entities represented by the participating institutions, which are all from one state, generally urban, and led by board-certified EMS physicians and possess adequate resources for ongoing quality improvement and innovation. This does not represent a majority of EMS and provider agencies within the United States.¹⁵ DECAL hopes to involve EMS directors with more varied experiences, such as those without formal EMS training, practicing in rural areas, or working in less-resourced settings. This diversity would broaden the perspectives gleaned by consortium fellows.

Maintaining rigorous standards for presented data and engagement of participants are challenges in e-learning.⁴ Encouraging a central location for each institution, rather than individual call-ins, increased participation at these sites. Assigning faculty mentors across sites who can review presentation materials and suggest peer-reviewed resources has also helped to ensure rigorous standards for discussions.

It is difficult to quantify the benefits of DECAL at this early stage. The objective value of board certification was evaluated: 100% of the six fellows participating in DECAL during its first 2 years passed the 2017 EMS board examination. This is compared to 76% of fellowship-trained physicians and 55% that used the practice pathway for the same test.¹⁶ Future assessments will include evaluations of fellow knowledge before and after participation, productivity measurements of creative output from the group, and employment following training.

Digital EMS California Academy of Learning is continuing to develop and expand. In 2018, another fellowship program was added, totaling six academic institutions in attendance for the monthly meetings. Advanced planning and delegation of duties has been crucial for DECAL's success. Just as fellows are assigned monthly roles, faculty from each participating university organize and lead a monthly session on a rotating basis. End-of-year assessments are completed by all faculty and fellows to determine opportunities for improvement, and the collegial relationships between the different institutions foster discussions for any midyear concerns.

CONCLUSION

Digital EMS California Academy of Learning's teleconference structure offers a unique educational environment for emergency medical services physicians-in-training. The consortium's model offers increased exposure for learners and seasoned professionals to a variety of emergency medical services systems, practice styles, and mentoring opportunities and has many potential applications within graduate medical education.

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