The Journal of Education in Perioperative Medicine

J Educ Perioper Med. 2000 Jan-Apr; 2(1): E012. PMCID: PMC4803399
Published online 2000 Jan 1.

Tele-Conferencing, Distance Learning and Tele-Mentoring: New Technology Harnessed fro Perioperative Education

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This editorial has been published in the print *JEPM* section of the *JCA*

The much used term "Telemedicine" has been broadly defined as the delivery of health care and sharing of medical knowledge over a distance using telecommunications technology. Telecommunications modalities include a gamut of systems from the audioconferencing to television to e-mail to the internet. However, it is the application of teleconferencing and teleconsulting methods that has driven an explosive interest in telemedicine through the 1990's and that continues unabated today. The principal attraction is the potential of telemedicine to improve access to medical services in rural areas (by connecting isolated practitioners in underserved areas with colleagues and medical advances) and to reduce cost (by eliminating unneeded visits or travel cost).

The diagnostic and therapeutic applications of telemedicine have, by now, been well publicized. Most advanced and practically useful in radiology, telemedicine has been explored in cardiology, dermatology, family medicine, emergency medicine, home health care and many other areas. While its utility is still being debated and important technological and cultural barriers exist, advances in technology and user knowledge have progressed to a point where cost effective use has been reported.[1]

The use of teleconferencing for advancement in medical education has been identified as a priority for development.[2] Some reported uses have been teaching family medicine residents on remote rotations and physician assistants as well as dissemination of knowledge on injury prevention, infection control, and health care worker safety. Telemedicine relating to anesthesia has only very recently been reported. Pre-anesthesia evaluation and consultation was successfully used to prevent cancellation of oral surgery patients.[3] Internet teleconferencing has been described recently.[4] In the current JEPM section of The Journal of Clinical Anesthesia, Cooper and colleagues report the successful demonstration of telemedicine technology to bring realistic full-scale simulation in anesthesia to larger audiences, live and interactively. They describe educational objectives, technology, planning, obstacles encountered and give advice to future adopters of this novel teaching modality.

Does videoconferencing add something to a medical education tool that other means of dissemination cannot provide? Certainly, Cooper et al. have chosen a unique educational concept for dissemination through their interactive technology. Their interactive "live" video-technology brings realistic moment-to-

moment decision making directly to the learner and involves him or her in the simulation. In simulation centers only a limited number of medical personnel can be "trained" during one session. Videoconferencing technology thus could add substantial value to simulation centers if their essential learning objectives can be met by transmitting the interactive environment of a patient simulation over a distance.

There are, however, many potential barriers to achieving such added value. Cooper et al. report largely positive feedback from a sample of their audiences at one point in time. Others have found that students' attitude toward interactive distance learning declines over time.[5] Discomfort with the technology, the need to speak up and be seen on video, and the boredom associated with waiting for error recovery may represent reasons why some learners may not see this learning modality as suited for their needs. Another very important issue is the training of teachers who will use videoconferencing. Merely "converting" a teaching activity, such as a lecture or simulation session, into videoconferencing format clearly is insufficient. Training for teachers and moderators is needed as novices are unlikely to appreciate the complex differences vis a vis conventional teaching.[6] Teachers need to learn more about how much time it takes to prepare, how to downplay technical control of the gadgetry in favor of instructional coordination, how to facilitate student-faculty interaction and how to get attainable educational goals accomplished.

Cooper et al. have shown that videoconferencing of full scale simulation is feasible. Now we need to look for in-depth analysis of the specific value provided by this teaching/learning modality. Very tentatively, the Boston group has begun to evaluate the impact of their methods on their audience. Their instrument for evaluation was a survey of conference participants. The authors make it clear that they did not use an experimental design to answer a question but to demonstrate a complex yet promising teaching method.

In future assessments of video-interactive distance teaching and learning, we need to learn more from the evaluation of teachers, moderators, sponsors and other stakeholders. Some questions to pose and answer are: What is the ideal target audience? What is the best evaluation instrument? How can anesthesiology training programs benefit? Is there a role for this modality in remediation? How is it applied most cost effectively? We look forward to further contributions that can help us understand the additional value this method might bring to all stakeholders in perioperative education.

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