HIV Online Provider Education (HOPE): The Internet as a Tool for Training in HIV Medicine

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Human immunodeficiency virus (HIV) treatment programs in resource-limited areas are expanding rapidly. Providing training and education to health care providers in these programs is a major challenge. We have employed Internet-based conferencing technology to conduct interactive case-based training conferences with health care professionals in Africa, Asia, and the Caribbean. This online program may be a model for other efforts to provide education to health care providers treating HIV-infected patients in the developing world.

Notable progress has been made in developing effective and durable treatments for HIV infection. However, in the third decade of the AIDS epidemic, a major challenge is making these life-saving drugs, along with the information and training needed to use them effectively, available in resource-limited areas. In many developing countries, access to antiretroviral therapy (ART) is increasing faster than training can be provided to health care workers, and there are few opportunities for continuing education in HIV medicine. For example, as of early 2006, >200,000 patients had initiated ART in South Africa, the country with the highest prevalence of HIV infection in the world [1]. This large-scale rollout of ART took place largely in the under-resourced public sector, with limited preparation given to health care providers for the task at hand.

One method of training health care providers with limited opportunities for continuing medical education is through the use of telemedicine [2, 3]. This technology has been shown to be feasible and effective as a tool for providing consultative advice and training [4]. However, many types of traditional telemedicine require specialized equipment and support staff [5, 6], which may be expensive and limited in availability. An alternative is to use Web-based voice-over-Internet protocol (VoIP) conferencing technology, which is commonly used to link businesses around the world. Several Web-based conferencing platforms are now available, including Microsoft Live Meeting, Centra (Saba Software), WebEx (Cisco Systems), and Elluminate (Elluminate, Inc.). We have used one such Web-conferencing platform to provide ongoing training and foster dialogue between HIV clinicians in the United States, Europe, and the developing world.

THE HIV ONLINE PROVIDER EDUCATION (HOPE) PROGRAM

The HOPE program is a collaborative initiative involving health care professionals in the United States, Europe, Africa, Asia, and the Caribbean. This program employs an Internet-conferencing technology called Centro (specifically, Centro 7, version 7.5.3.) to conduct VoIP interactive case conferences with health care professionals throughout the world. To participate, sites need a computer with an Internet connection, a set of speakers, and a microphone. The system allows many
different sites to participate in real time, and it enables the sharing of clinical information, such as photographs of a patient’s medical condition, as part of online conferences (figure 1). It also offers several interactive features, such as a function that allows participants to ask questions or make comments through voice or text messaging, a “whiteboard” that can be used by the moderator to highlight teaching points from a discussion conducted in real time, and a testing function that allows assessment of participants’ knowledge of the topic. Similar functionality is available through other Web-based conferencing platforms, such as Live Meeting, WebEx, and Elluminate.

HOPE conferences are conducted twice monthly and involve participants from around the world. A typical conference starts with an overview of a particular topic in HIV medicine relevant to the care of patients in resource-limited areas. In addition to summarizing the current understanding of a topic and providing an update on recent advances, the overview includes information on diagnostic tools and treatment options available in the developing world. After the overview, there is an interactive discussion of illustrative cases contributed by participants. These case discussions highlight the complexities of the particular topic and bring to the fore specific management issues that arise in the care of patients in the developing world. The case-based discussions also provide a forum for physicians throughout the world to share their experiences in managing complicated medical issues. Examples of conference topics include prevention of mother-to-child transmission of HIV, complications of ART (such as lactic acidosis and hepatotoxicity), tuberculosis (TB)/HIV coinfection (including discussions on outbreaks of drug-resistant TB), opportunistic infections, immune reconstitution syndrome, second-line regimens for the treatment of infections with drug-resistant HIV, and dermatologic issues in HIV-infected patients.

The discussants participating in these conferences have been drawn from the faculty of Harvard Medical School (Boston), Johns Hopkins Hospital (Baltimore), and Guy’s Hospital (London). Regular participants include doctors, medical students, and nurses at McCord, King Edward VIII, and St. Mary’s Hospitals in Durban, South Africa; Edendale Hospital in Pietermaritzburg, South Africa; Y. R. Gaitonde Centre for AIDS Research and Care in Chennai, India; Instituto Dominicano de Estudios Virológicos in the Dominican Republic; and MDH (a collaboration between Muhimbili University College of Health Sciences, Dar es Salaam City Council, and the Harvard School
of Public Health) in Tanzania. Sites in Rwanda, China, and Botswana have also participated, as have multiple centers in the United States. Over the past 3 years, the HOPE program has grown to include up to 50 health care providers at >10 sites around the globe.

To monitor the effectiveness of the HOPE program, we distribute annual surveys to participants to solicit feedback on conference content, the conferencing technology, and ideas for future topics and improvements. In response to the most recent survey, conducted in November 2006, 95% of our participants reported that the content was relevant to their practice. A similar proportion reported that there was an appropriate mix of didactic and interactive material. These surveys have allowed us to learn that, although the conference content is presented at an appropriate level for physicians, it is not as accessible to the nurses who frequently attend the sessions; this information has led us to develop a parallel conference program for nurses (see below). We have also been able to identify and correct technical problems, which as institutional “firewalls” that prevent access to the site and difficulties with audibility due to microphones without adequate sensitivity. Finally, on the basis of feedback from conference participants, we have identified new topics for discussion (e.g., HIV-associated renal disease, lipo-dystrophy, HIV-associated diarrhea, and adherence).

What are the advantages of Internet-based conferencing? Centra, Live Meeting, and other Web-based conferencing platforms avoid the need for specialized videoconferencing equipment that may be expensive and limited in availability. Discussants and participants can attend conferences from any location that has a computer with Internet access in the developing world, rather than having to travel to particular locations with specialized videoconferencing equipment. Web-based conferences and lectures can also be automatically recorded and archived for later review on the Internet (see the “Conferences” section of the HOPE Web site, http://www.hivconsult.org [registration required]). This allows users to pursue a “blended” approach to learning in which participants both attend real-time events (known as “synchronous learning”) and review online lectures and other materials on their own time (known as “asynchronous learning”).

There are, however, several limitations to this program. First and foremost, participating sites must have reliable access to computers and to the Internet. Some sites do not have computers that can be routinely used for these conferences. For example, at one potential site, there was only a single computer, and competing staff needs prevented it from being used for the HOPE conferences; other sites interested in participating simply did not have any computers. As computers become more available throughout the developing world [7], we expect this limitation to diminish. A more significant problem is lack of Internet access or, if present, unreliable Internet connectivity. Increased penetration of Internet access into the developing world may diminish this problem, but patterns of infrastructure development are such that the most remote sites, where Web conferencing might have the highest utility, may be the last in line to obtain the capabilities required to participate in such programs [8]. Another limitation of our program is that it is conducted exclusively in English, which poses challenges for providers who are not fluent in English and precludes participation of non–English-speaking health care professionals. Last, conducting real-time Web conferences when participants are located in many different time zones poses a significant scheduling challenge.

Despite these limitations, we have seen steady growth and improvement in the HOPE program over the past 3 years. In its first year, the program only involved sites in Boston, Massachusetts, and 2 sites in South Africa. Over the past 2 years, the program has expanded to include clinics and hospitals throughout Africa, in India and China, and in the Caribbean. Our faculty was initially located only in Boston, but it now includes physicians at Johns Hopkins Hospital and Guy’s Hospital. In addition, health care professionals in resource-limited areas have used the program to link directly with each other to discuss issues that are more common in their particular setting, thereby building local capacity for training and education. Finally, the program has enabled sites to collaborate on clinical research projects, such as investigations into drug resistance and treatment options for patients who develop lactic acidosis.

**FUTURE DIRECTIONS**

In addition to continuing the HOPE program for physicians, we are developing a series of conferences for nurses in resource-limited areas that focus on topics relevant to HIV nursing care. To complement the real-time interactive conferences, we are also developing other online resources geared toward health care professionals in resource-limited areas, including e-mail discussions, lecture material, and key references (for examples, see the HOPE Web site, http://www.hivconsult.org [registration required]). Additionally, we are creating an image bank of instructive cases of HIV infection in Africa and other resource-limited areas (see the “AIDS in Africa” section of the Partners Infectious Disease Images Web site, http://www.idimages.org [registration required]).

**CONCLUSIONS**

The HIV epidemic represents an unprecedented challenge to global health, and training of local experts in the care of HIV-infected patients is a key part of an effective response. Our pilot project has demonstrated the feasibility of Web-based conferencing in providing education to health care providers who treat HIV-infected patients and in facilitating dialogue between
As one participant noted, “What is wonderful is that there is global participation with doctors at different levels of experience and knowledge, dealing with the HIV epidemic at different stages… This forum has literally brought the world into one classroom.” As such, interactive online case-based discussions are one way of “bridging the gap” in the global response to the HIV epidemic.

Acknowledgments

The HIV Online Provider Education (HOPE) program acknowledges the support of the Harvard University Center for AIDS Research (CFAR), which has purchased "seats" from Centra for use by this program (a "seat" at the conference allows a site to participate in the Web-based conference). Centra has donated additional seats to the Harvard University CFAR for this program. The authors have not received any financial assistance from Centra.

Supplement sponsorship. This article was published as part of a supplement entitled “The Realities of Antiretroviral Therapy Rollout: Challenges to Successful Programmatic Implementation,” sponsored by the Harvard Medical School Division of AIDS, the Harvard University Center for AIDS Research, and the Harvard Initiative for Global Health.

References