A STUDY OF PHYSICIANS' ATTITUDES TOWARD CONTINUING MEDICAL EDUCATION

A Graduate Research Project

Submitted to the Faculty of

Baylor University

In Partial Fulfimment of the

Requirements for the Degree

of

Master of Health Care Administration

by

Captain(P) Donald J. Bradley, MSC

11 June 1984

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; Distribution unlimited
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) 3-89	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION US Army-Baylor University Graduate Program in Health Care 6b. OFFICE SYMBOL (If applicable) Admin/HSHA-IHC	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) Ft. Sam Houston, TX 78234-6100	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO. / PROJECT NO. / TASK NO. / WORK UNIT ACCESSION NO.

11. TITLE (Include Security Classification)
A STUDY OF PHYSICIAN'S ATTITUDES TOWARD CONTINUING MEDICAL EDUCATION

12. PERSONAL AUTHOR(S)
CPT Donald J. Bradley

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Study	FROM Jul 83 TO Jul 84	Jun 84	70

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	Health Care, Continuing Medical Education

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This study examined the attitudes of physicians toward continuing medical education. A survey was given to selected doctors within the US Army Health Services Command. The study found that the use of various sources of continuing education is largely dependent upon easy accessibility. The author recommends increased funds for institutions located far away from continuing education options, particularly for low density specialties. Alternative types of continuing education that can be controlled by Health Services Command, such as consultants, specialty conferences, and teleconferences, should be given maximum use.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
X UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT. ☐ DTIC USERS	
22a. NAME OF RESPONSIBLE INDIVIDUAL Lawrence M. Leahy, MAJ, MS	22b. TELEPHONE (Include Area Code) (512) 221-6345/2324
	22c. OFFICE SYMBOL HSHA-IHC

DD Form 1473, JUN 86 *Previous editions are obsolete.* SECURITY CLASSIFICATION OF THIS PAGE

TABLE OF CONTENTS

ACKNOWLEDGEMENT

Those who engage in research accumulate obligations. I wish to express my thanks to Major General Frank F. Ledford, Jr, Commander, Letterman Army Medical Center, and Colonel A. Gordon Hennessy, Deputy Commander for Administration/Preceptor, Letterman Army Medical Center, for providing me an invaluable opportunity to conduct this study. My special thanks to Colonel Lewis Lorton, United States Army Institute of Dental Research, Presidio of San Francisco, California, for providing his support and accepting demands on his time to complete the statistical analysis required to complete this project. Without his efforts, this project could not have been completed.

I also wish to thank my research committee, Colonel Richard Harder, LTC Donald McSwain, and LTC Robert T. Moore, for providing many fine recommendations and comments during completion of this project. And last but not least, I am especially grateful to my wife, Jean, for helping with the data conversion, and to Carol Mucelli, my preceptor's secretary for typing the final manuscript.

LIST OF TABLES

I. INTRODUCTION

Continuing education is becoming an essential activity for health care providers. This professional imperative arises from the technology explosion of the 1970s, the rapid proliferation of allied health professions, and the societal demands that health providers act for the public good and accept accountability and responsibility for their actions. Because of patient/consumer heightened medical awareness, society no longer treats physicians and other providers with deference; the shroud of mysticism is unraveling. Hence, health care providers respond by continuing to learn the latest procedures and techniques to treat their knowledgeable patients.[1]

Continuing education for health providers has been mandated by numerous professional organizations. The Oregon Medical Association established the first mandatory program in 1969. In 1971 New Mexico became the first state to pass and implement a law requiring participation in continuing education for renewal of licenses. In 1979 the Joint Commission on Accreditation of Hospitals (JCAH) formally required that hospitals establish continuing education programs. The JCAH imposed its requirements on the myriad of educational mandates and recommendations from state agencies and associations. Most important, it placed responsibility for continuing education on the employer rather than the employee.[2]

Impact of Technology on Continuing Education

The impact of information and technology explosions on continuing education is well documented. One study indicates that "new entrants to the labor force may have to learn an entirely new skill three or four times in the

course of a working lifetime." A study by Mayhew and Ford indicates "the half-life of knowledge in a profession has shrunk to perhaps five years." Curtis and others quantify the work of Mayhew and Ford:

> Any person 50 years old, working in a science field, is in the position of having only 12 1/2 percent of the total knowledge of his field known at the time of his graduation from college while 87 1/2 percent is of more recent development. Such facts make continuing education a modern imperative. Even the education of the budding professional can no longer be strongly tied to facts, half of which will have become obsolete by the time he will have reached the age of 30.[3]

Teleconferencing:

Continuing Education within Health Services Command

The US Army Health Services Command (HSC) has been on the forefront in adopting one of the latest technological advances: satellite communication. Its widespread availability permits programs to be broadcast live to a specific audience. A program may be made interactive by providing the audience with telephones to ask the lecturer specific questions. Although this system may lack the spontaneity of a live audience (asking questions face to face), participants have some control over the program's course.

In 1979 HSC began broadcasting "BAMC Hour". Originating from Brooke Army Medical Center (BAMC), the programs are transmitted to several remote military installations. Using telephones, interested audience members can ask questions through a moderator. By offering this limited form of two-way communication (two-way audio but, one-way video) participants qualify to receive credit toward the American Medical Association's Physician's Recognition Award. The program was expanded in 1981 when general military subjects and training of soldiers for common tasks were provided in a program titled "Studio B". "Studio B" provided only passive communication since there

were no opportunities for viewers to direct questions to the lecturer or moderator. "Studio B" was discontinued during the spring of 1984. Video tapes are available to authorized viewers for both series if an organization wants to view a program at a more convenient time or if it lacks the appropriate receiver.[4]

HSC is expanding the system to provide additional transmission sites. Current plans require each site to produce one to two hours of live programming per week. Eventually, medical centers will be producing continuing medical education programs formated like "BAMC Hour". Each production center will cost at least $100,000 for production equipment. Additional funds will be required to modify existing lecture halls or auditoriums for producing the telecasts. Operating expenses for up-link time, production personnel, and technicians have not been considered in HSC's program.[5]

Everett Rogers, a diffusion theorist, suggests four attributes of an innovation which relate to its acceptance and adoption. First, the new system must be perceived to be better than existing systems. Being new is not enough. Second, the system must be compatible with existing values of the proposed users. Third, the results must be visible to others. Fourth, the system must be testable. He also believes that perceptions become self-fulfilled prophecies, therefore, an implementation strategy must (1) identify attributes of existing and proposed systems, and (2) identify perceptions which interfere with implementation of an innovation. This research paper is designed to identify perceptions of physicians assigned to HSC facilities within the contintental United States. It emphasizes how physicians expect to benefit from continuing medical education and what they consider to be

determinants of successful continuing medical education programs. It considers what programs exist and the extent to which they are used. Finally, it compares technical capabilities of videoconference systems with physician expectations, and recommends changes to planned videoconference systems to improve physician acceptance.[6]

Statement of the Problem

The problem is to assess physician expectations of continuing medical education. The problem will be resolved by answering the following research questions:

1. What do physicians expect to receive from continuing medical education?

2. To what extent are continuing medical education resources currently available to professionals?

3. To what extent are available continuing medical education programs perceived as adequate?

4. Are there relationships between available continuing medical education resources, physician expectations, or adequacy of resources; and hospital size and distance between the health care institution and adequate sources of continuing medical education?

The research hypotheses are:

1. Physicians expect to receive social as well as educational benefits from a continuing medical education experience.

2. Physicians prefer continuing medical education oriented toward their specialty, rather than general medical knowledge.

3. Physicians' preferences of sources of continuing medical education vary with distance from post-secondary institutions.

4. Physicians' use of continuing medical education programs varies with distance from post-secondary institutions.

5. Physicians' participation in participative continuing medical education programs is dependent upon the reputation of the instructors.

Objectives, Criteria, Assumptions, and Limitations

Objectives

Completion of this research project was dependent upon accomplishment of the following tasks.

a. Preparing a preliminary questionnaire for review by local physician sample.

b. Presenting the questionnaire to local physicians to identify structural deficiencies, and to assess readability and diversification of responses.

c. Revising the questionnaire and preparing cover letters.

d. Preparing a sample list from physician population. An alphabetical roster of HSC assigned physicians was obtained from US Army Medical Department Personnel Activity.

e. Distributing questionnaires.

f. Collecting and analyzing questionnaire responses.

g. Identifying technical capabilities and human factors associated with videoconferencing systems.

h. Comparing technical capabilities and physician expectations.

i. Recommending changes to the planned videoconference systems to improve physician acceptance.

Criteria

The Chi-square statistical techniques uses $\alpha = 0.05$ at the appropriate

degrees of freedom. Table 2 states the relationships to be studied and the applicable degrees of freedom associated with each test. Associations must be statistically significant to justify recommending different procedures for different specialties and distances to continuing medical education services.

Assumptions

This research proposal assumes that respondents are representative of physicians assigned to Health Services Command.

Limitations

The study is not designed to consider access barriers to continuing education medical education such as class schedules and academic calendars.

The findings arising from this research proposal do not consider the influence of specific continuing medical education requirements imposed by state governments or medical associations. The findings will be applicable only to Health Services Command facilities within the continental United States.

Use of Continuing Education

Participation in continuing education programs to meet expectations of the public is a requirement for professionals. Continuing medical education is expected to teach new developments and review fundamental concepts, however, professional educators disagree on the best mechanism for achieving continuing education goals. Are lectures effective tools? Are practical, hands-on sessions more beneficial to the practitioner? Authorities recommend that continuing medical education be practice-linked, aimed at changing physician practice patterns. Imparting knowledge is generally not considered adequate. L.S. Stein adds that "CME should emphasize objectives which relate to a physician's clinical performance rather than acquisition of knowledge."[7]

A study by Rothenberg found that typical physicians devote approximately four hours per week reading journals. Strenuous demands and a rigorous professional atmosphere encourage active physician participation. They spend several days to two weeks per year attending professional meetings and formal postgraduate programs. The respondents to Rothenberg's questionnaire also believe that formal postgraduate programs offer the best source of continuing medical education. Other research indicates there is a difference in the acceptability of a specific continuing medical education methodology which is dependent upon the individual's specialty. For example, research suggests that surgeons prefer lectures, while internists prefer other methods. Other surveys question the basic use of lectures as a continuing education tool, arguing that lectures are not the proper tools when the audience has had much experience in the topic being discussed. The lecturer is not readily accepted as an authority, rather he must demonstrate his expertise by being widely known.[8]

In an evaluation of successful nursing continuing education programs, Maureen Kennedy suggests that the success or failure of continuing education programs is measured by the educational quality of the program, participant satisfaction, and cost of the program to the institution and individual. These same attributes are applicable to other professional continuing education programs. Participants need to be offered a program which meets their needs at the appropriate cost. Because continuing education is directed at active practitioners, continuing education directors have the added responsibility to establish reputable, viable programs. Successful programs identify qualifications of the faculty, recognize the needs of the intended audience and develop formats appropriate to the subject being taught. Unlike

preparatory education programs, such as medical and law school, continuing education programs are frequently considered to be optional. Unpleasant programs are not tolerated.[9]

Instruments to Implement Continuing Education

Institutions use many instruments to implement continuing education programs. Internal assets are used for in-service training to maintain skills and develop good work habits. Guest lecturers are used to discuss topics for which local in-house expertise is not available. Colleges and universities conduct refresher programs and provide opportunities for individuals to practice as new allied health professionals. Association conferences and meetings offer opportunities to discuss specific topics with numerous individuals working with other organizations.

Radio and telephones have been used for many years to provide education to geographically isolated student populations. In the 1920s several universities used radio instruction as an outgrowth of electronic experimentation. Before 1936 over 200 radio stations were licensed to educational institutions, but commercial radio stations drove them from the marketplace. Later, the Federal Communication Commission reserved part of the FM spectrum for education. Since then radio has been used to teach sciences, foreign languages, music, math, English, literature, and social sciences.[10]

Telephones were first used in 1939 when Dr. Winterstein, the Director of Medical Education in Iowa, initiated a program to meet the needs of home-bound and hospitalized students. With the help of American Telephone and Telegraph more than 1,000 students had intercom equipment installed in their homes. Dentists living in Scranton, Pennsylvania, and Chicago used the first university-level program in 1947 when the College of Dentistry of the

University of Illinois offered an extension service using a telephone system.11

Technological advances which combine video and audio capabilities in inexpensive systems provide the latest communications systems. These telecommunication systems have been used to conduct conferences and routine corporate meetings. They have connected activities within a city as well as facilities spread across the country. Teleconferencing offers many capabilities to the user. The system can be used to provide unidirectional communication, much like a book or a lecture provided over the radio. With unidirectional systems the person is a passive recipient of information; nothing he says or does affects the communication. Teleconferencing systems can also provide interactive communications, giving the listener an active role in the program. Participants are both senders and receivers of information. When the systems provide for both sending and receiving, they can offer many of the advantages of seminars, conferences, and meetings. Properly equipped two-way teleconferencing systems do not become the limiting factors. Instead, the teacher and the software do.[12]

Other studies have evaluated the basic communication process to identify what actually happens during a conference or meeting. Finkel determined that telecommunications are effective for three to four hours, maximum. To attain even that level requires skilled producers to make the programs dynamic, creative, and interesting to maintain the participants attention. Finkel suggests developing a special meeting design, developing new learning techniques associated with teleconferencing, and giving special consideration to scheduling and program formulation.

Existing Systems

In January 1984 the Association of Western Hospitals sponsored the fourth

annual convention on telecommunications. Speakers from around the country discussed their experiences in establishing videoconference systems marketed to the health care industry. They concurred that successful videoconferences require extensive and laborious preparation. Richard Santich, Director, Education Department, Greater Cleveland (Ohio) Hospital Association, stated that software determines the acceptability of the system. His organization offered continuing education programs to its membership using the Instructional Television-Fixed Service (ITFS) system. Using low-power transmitters, ITFS facilitates low-cost communication between facilities in the same geographical area. The program was directed at the in-service of hospital employees. Despite extended transmittal hours and serving hospitals in a limited area, the Association did not receive adequate support from its membership. Video tapes of previous broadcasts were frequently requested when members could not schedule their employees to participate in the broadcast at the scheduled time. The increased demand for tapes prompted Santich to eliminate live broadcasts and provide videotapes to members through a library service.[13]

The Health Research and Educational Trust of New Jersey, a research arm of the New Jersey Hospital Association, operates a statewide program which offers ten hours of programing per week. The New Jersey system has an annual operating budget of $400,000 to $500,000 per year. Approximately $150,000 is required to transmit the initial signal from the ground to the satellite. Another $40,000 is spent to capture the signal and direct it to the individual hospital.[14]

For approximately $5,000 per year, the Research and Educational Trust provides programs oriented toward hospital in-service between 1:00 PM and 3:00

PM, Monday through Friday. The fee provides study guides and evaluation tools conference participants can use during the program. The director of the program, Richard Getz, said each one-hour program requires three to four hours of preparation or a four to five hour commitment from each speaker.[15]

Mr. Getz stated that their program is successful because his organization has a broad support group. He described a previous system established by the National Institute of Health and University of California, Los Angeles, which failed because it was designed only for physicians and did not establish a large supporting contingency. Therefore, more allied health professionals are needed to help distribute costs.[16]

Another panelist, David Shively, the Director, Association of Hospital Television Networks, presented his Association's observations and recommendations about designing successful videoconference systems. First, he believed filming Grand Rounds is ineffective because it is boring. Second, physicians participate in videoconferences only when experts are unavailable in the immediate area. Third, programs must be less than two hours long otherwise the audience becomes listless and bored. Fourth, the videoconference must use good graphics and relevant material. Without quality and relevance, videoconferences become expensive side shows to other educational opportunities.[17]

Several commercial enterprises offer continuing education using television. The American Network plans to broadcast teleconferences which will include continuing medical education programs. The basic service will cost approximately $1,100 per month, plus $2.00 per hospital bed. The network provides patient health care programing, an earth station, and a microcomputer and printer at the basic subscription rate. The microcomputer and printer are

provided so participating hospitals can gain access to the Hospital Data Channel, a data collection system used by many civilian hospitals.[18]

Cable Health Network distributes its Lifetime channel on cable television systems. Lifetime provides extensive programing for the general public, however, its "Physician Journal Update" provides a weekly, two-hour video-journal. Journal abstracts are introduced and technological advances are discussed. Pharmaceutical inserts are scrolled across the screen periodically to introduce new medications. Recent subjects included: health needs of elderly Hispanics, quality of histopathologic diagnosis, and surgical treatment of cutaneous melanoma. The network also sponsors specialized programs, the Cable Health National Video Seminars; which are from 1 1/2 to 3 hours long. Viewers can ask the lecturer or panelist questions using a toll-free number.[19]

The Hospital Satellite Network provides daily, regularly scheduled continuing medical education programs using satellite technology. In addition, weekly programs are provided for nurses, allied health professionals, and administrators. Recent programs reported on the NIH consensus on the use of ultrasound, diagnosis and treatment of monarticular arthritis, approaches to stress testing, and prophylactic antibiotics in obstetrics and gynecology. The University of California, Los Angeles, or the individual receiving hospital can accredit the programs, but individual hospitals must be accredited providers. The American Medical Association requires that there be active interaction between program participants and the lecturer before a continuing education session may be accredited. Because the Hospital Satellite Network does not provide a system for submitting questions from receiving stations, there must be a specialist of the topic being

presented at the receiving station. Hospital Satellite Network costs approximately $1,200 to $3,000 per month, depending upon the size of the facility.[20]

Characteristics of Effective Teleconferencing Systems

In Video Teleconferencing: Conference Mode of the Future, Snead and Duncan state that "the greatest technical accomplishment in the world may go unused if it is not designed with people in mind." To apply that observation to video-conferencing as envisioned by Health Services Command, it is necessary to compare the effectiveness of teleconferences vis a vis face-to-face communication. Numerous studies have been conducted to evaluate the effectiveness of teleconferences as alternatives to face-to-face meetings, particularily decision-making conferences frequently used in business.[21]

Dickenson's study discussed the universal etiquette which determines distance between people. He described intimate communications as those between physical contact and 18 inches apart. Personal communications are between 18 inches and 4 feet, social communication (close phase) between 4 feet and 7 feet, social communications (far phase) between 7 feet and 12 feet, and public communication is greater than 12 feet between participants. Participation in an education or business meeting session requires social communications (far phase), therefore, Dickenson determined that the screens should provide approximately 8 feet to 9 feet between the individuals and the projection screen.[22]

Dickenson also discussed the awareness of social position and the relative acceptance of teleconference techniques to conduct business meetings. He found increased acceptance if the initiative for conferences comes from the upper eschelons of an organization, and promotes the system as a status symbol, rather than a mechanism for saving money.[23]

Snead and Duncan argue that "human factors have significant bearing on why people travel." Using videoconferences as a means of saving time and money may not be strongly supported if counteracting forces are too strong. The many positive variables associated with videoconferences include:

1. Meetings and sessions are more businesslike and to the point.
2. Videoconferences are more timely than many of the alternatives.
3. Videoconferences eliminate travel fatigue.
4. More people are allowed to participate.
5. They reduce hardship of family separation.
6. Videoconferences may become status symbols.[24]

Negative attributes of videoconferences are the decreased social interaction which usually accompanies face-to-face meetings. The technique also removes the advantages associated with breaking from normal business routine when participants travel. These negative attributes may become the deciding factors if social interactions and breaks in normal business routines are valuable considerations for participant satisfaction.[25]

The Business Planning Group, Bell Canada, identified several determinants of user satisfaction in a report published in April 1975. Although their study considered videoconferences which provided both two-way audio and video communications, their findings are probably applicable to the videoconferences envisioned by HSC. The Bell study concluded:

1. As the complexity of the topic increased, participants perceived a greater need for travel.

2. Personal familiarity is negatively related to willingness to replace travel in situations which require building or maintaining relationships.

3. Routine actions have greater propensity for substitution.

4. There is a negative relationship between the number of non-business activities and the propensity to substitute videoconferences for travel.

5. There is a negative relationship between an individual's position in the organization's hierarchy and use of videoconferences.

6. There is a positive relationship between perception of the utility of alternatives and the willingness to replace travel.

7. Videoconferences are unacceptable substitutes when participants participate in many non-business activities.[27]

HSC's investment in satellite communications is based on an assumption that videoconferencing is a viable system to provide continuing medical education, however, there has been no study to assess the benefits prospective audiences expect to derive from any continuing medical education program. Before thousands of dollars are spent on expanding the production of videconferences, the expectations of the primary audience, physicians, must be considered. Important questions include: How do they expect to benefit from continuing medical education? To what extent do they use existing continuing medical education programs? Will videoconferencing techniques fulfil their needs and expectations?

Research Methodology

Data to resolve the research problem was derived from written questionnaires sent to a sample of physicians assigned to Health Services Command. The questionnaire, included in Appendix B, gathered information using two approaches. First, each respondent identified his specialty, the size of his

institution, and the distance to the nearest campus or other location which offers continuing medical education or programs suitable to his needs and specialty. These three responses serve as the independent variables against which the dependent variables are measured. The remaining questions required the respondent to evaluate specific questions and to record their responses. The responses were made using a Likert-like scale. The dependent variables included:

1. availability of continuing medical education programs.
2. benefits of continuing medical education.
3. utilization of continuing medical education.

Table 1 specifies which questions were introduced to gather responses related to each variable.

The questionnaire was validated by asking 15 physicians at Letterman Army Medical Center, Presidio of San Francisco, California, to complete the survey. The responses were reviewed to assess the following: readability, question format, and diversification of responses. The 15 questionnaires were not included in the final survey.

Potential problems include misinterpretation of the subjective terms used to assess the dependent variables, however, no attempt was made to quantify "very low usage" or "very high usage." Individual perceptions and interpretations are important for determining the actual acceptability of continuing medical education programs.

Because of the population size, approximately 340 questionnaires were required to produce a Chi Square test significant at $\alpha = .05$ with 2 degrees of freedom. The validated questionnaire was distributed to 1000 identified respondents. Each questionnaire was addressed specifically to a physician

selected from a roster of 4,000 assigned to Health Services Command within the continental United States. The sample was drawn by selecting every fourth physician from an alphabetical roster provided by the Army Medical Department Personnel Activity. A cover letter explained the purpose of the study and requested the respondent's support and time (Appendix C). Research indicates that the response rate increased when follow-up letters are sent to non-respondents after initial distribution of the questionnaire, therefore, follow-up letters were used in this study[28] (Appendix D).

Analysis of Data

The response rate to the questionnaire may alter how the data is analyzed. Initially, the Likert-like scales was used without any adjustments. The Likert-like scales used to record responses to questions VI and VII may be collapsed into the following groups: very high with high, moderately high with moderately low, and low with very low. The Chi-square statistical procedure was used to relate dependent and independent variables. Table 2 provides a detailed description of the relationships analyzed, the applicable degrees of freedom, and level of significance. BMDP Statistical Software, 1982 edition, was used to complete the statistical calculations.

TABLE 1
SOURCES OF DATA ABOUT DEPENDENT VARIABLES

Dependent Variable	Questions Used To Solicit Data
Availability of CME Program	II, IV
Benefits of CME	VII
Utilization of CME	V, VI

TABLE 2
ANALYSIS OF DATA

Table Contents

1 Respondents Utilization of Available Continuing Medical Education (CME) Programs
Independent: Source of CME
Dependent: Utilization
Format: Quantity & Percentage Distribution, by Source of CME

2 Respondents Preference for CME, by Source of CME
Independent: Source of CME
Dependent: Preference
Format: Quantity and Percentage Distribution, by Source of CME

3 Respondents Categorization of Available Specialty CME Programs

Independent: Respondents Specialty
Dependent: Perceived Adequacy
Format: Quantity & Percentage Distribution, by specialty.

4 Results of Chi-Square Two-way Tests for Association between use of each CME Source and Use and Distance from Nearest Institution offering Adequate CME.

5 Chi-Square Two-way Test for Association between Use of (Each Source of CME) and Distance from Nearest Institution offering Adequate CME.
Independent: Distance from Nearest Institution offering Adequate CME
Dependent: Utilization of Each Source of CME
Degrees of Freedom: 8 or 20

6 Results of Chi-Square Two-way Tests for Association between use, by Soruce of CME, and Size of the Health Care Institution.

7 Chi-Square Two-way Test for Association between Use of (Each Source of CME) and Size of Health Care Institution.
Independent: Size of Health Care Institution
Dependent: Utilization of Each Source of CME
Degrees of Freedom: 4 or 10

8 One-way Analysis of Variance
Independent: Physician Specialty
Dependent: Attitude toward CME (responses from question VII of Questionnaire)
Degrees of Freedom: greater than 5

FOOTNOTES

1 Robert Boissoneau, Continuing Education in the Health Professions, (Rockville, Maryland: Aspen Publications, 1982), p. 3.

2 Erwin W. Brody, "Continuing Education in Selected United States Hospitals: Administrator's Perceptions of Needs and Program Providers," (Ph.D. dissertation, Memphis State University, 1982), p. 4; Robert C. Derbyshire, "The Medical Profession," in Power and Conflict in Continuing Professional Education, ed. Milton R. Stern, (Belmont, California: Wadsworth Publishing Company, 1983), p. 80.

3 Melvin R. Levin and Joseph S. Slavet, Continuing Education, (Lexington, Massachusetts: Heath Lexington Books, 1970), p. xviii; Lewis B. Mayhew and Patrick J. Ford, Reform in Graduate and Professional Education, (San Francisco, California: Jossey-Bass, Inc., Publishers, 1974), p. 35, cited in Erwin W. Brody, "Continuing Education in Selected United States Hospitals: Administrator's Perceptions of Needs and Program Providers, p. 5; and Frieda Smith Curtis, et al., Continuing Education in Nursing, (Boulder, Colorado: Western Interstate Commission for Higher Education, 1969), p. 2, cited in Erwin W. Brody, "Continuing Education in Selected United States Hospitals: Administrator's Perceptions of Needs and Program Providers, p. 6.

4 U.S. Army Health Services Command, *Information Paper*, Subject: HSC-TV Satellite Network, 9 March 1983.

5 U.S. Army Health Services Command, 9 March 1983.

6 Marcia Baird and Marvis Monson, "How to Tackle Training for Teleconference Users," Educational and Industrial Television 14(August 1982): 46.

7 Phillip R. Manning, "Continuing Education: the Next Step," Journal of the American Medical Association 249(February 25, 1983):1042; Leonard S. Stein, "The Effectiveness of Continuing Medical Education," Journal of Medical Education 56(1981):103-110, cited in Manning, Journal of the American Medical Association, p. 1043.

8 Robert Boissoneau, Continuing Education in the Health Professions, pp. 109, 208; and Eleanore Rothenberg, et al., "Continuing Medical Education in New York County: Physician Attitudes and Practices," Journal of Medical Education, 57(July 1982):545.

9 Maureen S. Kennedy, "Designing and Implementing Successful Continuing Education Programs," Journal of Continuing Education in Nursing 14(January/February 1983):16; Patrick O'Reilly, Charles P. Tifft, and Charlene DeLena, "Continuing Medical Education: 1960's to the Present," Journal of Medical Education 57(October 1982):819-826.

10 Lorne A. Parker and Marvis K. Monson, More Than Meets the Eye, (Madison, Wisconsin: Regents of the University of Wisconsin System, 1980). pp. 3, 4.

11 Palaadgu V. Rao and Bruce L. Hicks, "Telephone-Based Instructional Systems," Audiovisual Instructions, April 1982, cited in Lorne A. Parker and Marvis K. Monson, More Than Meets the Eye, p. 32.

12 Parker and Monson, More Than Meets the Eye, p. 2.

13 Coleman L. Finkel, "What Teleconferencing can and cannot do for your Meeting," Management Review 71(July 1982): 12; Presentation by Richard Santich, Greater Cleveland Hospital Association, at Association of Western Hospital Telecommunications Convention, San Francisco, California, January 17, 1984.

14 Presentation by Richard Getz, Health Research and Education Trust of New Jersey, at Association of Western Hospital Telecommunication Convention, San Francisco, California, January 17, 1984.

15 Presentation by Richard Getz, January 17, 1984.

16 Presentation by Richard Getz, January 17, 1984.

17 Presentation by David Shively, Association of Hospital Television Networks, at Association of Western Hospital Telecommunication Convention, San Francisco, California, January 17, 1984.

18 The American Network, undated.

19 Cable Health Network. "The Professional Program Series," undated; "Physician's Journal Update," broadcast 27 June 1984.

20 Hospital Satellite Network. "Health Satellite Network," undated.

21 S.E. Snead and L.H. Duncan. Video Teleconferencing: Conference Mode of the Future. Wright-Patterson Air Force Base: U.S. Air Force Institute of Technology, AD-101 717, p. 72.

22 James P. Duncanson and Arthur D. Williams, "Video Conferencing: Reactions of Users," Human Factors (October 1973):471-485, cited in S.E. Snead and L.H. Duncan, Video Teleconferencing: Conference Mode of the Future, p. 74.

23 James P. Duncanson and Arthur D. Williams, "Video Conferencing: Reactions of Users," Human Factors (October 1973):471-485, cited in S.E. Snead and L.H. Duncan, Video Teleconferencing: Conference Mode of the Future, p. 76.

24 James P. Duncanson and Arthur D. Williams, "Video Conferencing: Reactions of Users," Human Factors (October 1973):471-485, cited in S.E. Snead and L.H. Duncan, Video Conferencing: Conference Mode of the Future, p. 77 and 106.

25 S.E. Snead and L.H. Duncan, Video Conferencing: Conference Mode of the Future, p. 108.

26 James H. Kollen and John Garwood. Travel Communications Tradeoffs: The Potential for Substitution Among Travellers. (The Business Planning Group, Bell Canada, April 1975), pp.14-15, cited in S.E. Snead and L.H. Duncan, p. 109.

27 Walter R. Borg and Meredith D. Gall, Education Research: An Introduction, (New York: David McKay Company, 1971), p. 207.

II. DISCUSSION

The validated questionnaire was distributed to 1014 physicians assigned to US Army Health Services Command. Four hundred thirty-four were completed and returned in time for inclusion in these findings. An additional 30 were returned by the US Post Office because the addressees could not be located. Six more were returned incomplete and could not be used. The response rate of those assumed to have reached their destination, was 49 percent.

A summary of responses is provided in Appendix E. Each question is accompanied by the number of respondents, the percentage providing each answer, and a cummulative percentage, if appropriate. Data summaries are included in the tables.

Use and Preference for CME Sources

The first questions to be resolved are, "to what extent are continuing medical education resources currently being used" and "what are the preferred sources for CME." Table 4 summarizes the responses which resolve these questions. In general physicians do not utilize colleges, medical associations or teleconferences to provide their continuing medical education. A surprisingly large number, 55 percent, report less than moderately low use of grand rounds. Professional journals and publications are used with at least moderately high usage by 88 percent of the respondents. Consultants and specialty conferences are used at the same rate by at least 53 percent.

The Chi-Square tests for association reported in Tables 6 and 8 support the hypothesis that usage and preference of CME varies with the size of the institution and distance from sources of CME. The use of grand rounds,

consultants, and specialty conferences does vary significantly among institutions of different sizes. For example, 54 percent of the respondents from institutions with more than 300 beds stated they make at least moderately high use of grand rounds as a continuing education tool. Only 30 percent of the respondents from institutions with fewer than 300 beds made that claim. The reduced usage at smaller hospitals may indicate either the complete lack of grand rounds at smaller institutions, or sessions that do not meet physician needs. Respondents from the larger institutions also reported that approximately 64 percent make at least moderately high use of consultants and conferences. Respondents from smaller institutions reported only 35 percent making at least moderately high use of the same sources. The reduced usage at smaller institutions may indicate that consultants are not available to conduct continuing education sessions; conferences are too far away for frequent use; or financial resources are not available to compensate either consultants' visiting the institution or physicians' traveling to specialty conferences.

As expected, actual usage varies markedly from preferences for most CME sources. The response indicates that the actual usage of professional journals approximates the preferences. ($\chi^2 = 9.83$, less than χ^2 critical = 12.59 at $\alpha = 0.05$) However, the respondents indicate they would use the other sources much more frequently, if they were available (see Table 9). The use of grand rounds, consultants, and specialty conferences is obviously dependent upon their availability. Grand rounds are generally associated with larger medical facilities with a significantly large staff to justify conducting such endeavors. Consultants require the availability of a consultant pool from which to attract physicians. Specialists interested in conducting continuing education sessions are not likely to be available in rural communities; also

they are unlikely to travel great distances without requiring compensation for their travel expenses.

Table 10 summarizes the results of a Chi-Square analysis of variance between physician specialty and the use and preference for continuing medical education sources. The association of usage with specialty is statistically significant for only one source of continuing medical education, grand rounds, with $p = 0.0193$. Preferences among the specialties is statistically significant for three sources: grand rounds, consultants, and specialty conferences. A closer examination shows that, with the exception of radiologists, at least 27 percent of any specialty group actually evaluates their use of grand rounds as "greater than moderately high." Fifty-two percent of the psychiatrists and medicine specialties use the same source at a greater than moderately high rate.

The preference for grand rounds is greater than the use (Table 11). As noted above, the differences may be due to lack of grand rounds or the inability to satisfy the specific needs of certain specialties. For example, obstetricians/gynecologists, pediatricians, and pathologists reportedly would make more use of grand rounds, if access were not limited. These specialties are usually assigned in smaller numbers to community hospitals, than medicine and surgery physicians. They do not have enough staff interested in the same specialties to support well planned grand round programs.

Perceived Adequacy of CME

Sixty-four percent of the respondents indicated they believe the existing continuing medical education system is adequate. Chi-Square analysis of variance between perceived adequacy of CME and physician specialty (Table 12) indicates that there are perception differences between the basic specialties. Seventy-two percent of the medicine specialties classify the system as

adequate. Approximately 54 percent of the remaining specialty groups stated the system was adequate. The difference in perception may be due to the relative number of physicians in each specialty. For example, 51 percent of the respondents were in a medicine specialty, 21 percent were surgeons, ten percent were pediatrics, and so forth. Assuming this distribution is representative of physicians within Health Services Command, physician in the non-medicine specialties have an increased opportunity of being assigned at facilities without peers in the same specialty.

Respondents who believe the system is inadequate report a reduced level of usage of all sources of continuing medical education. Chi-square analysis of variance indicates that the differences between the preferences of those who classify the system as adequate and those who classify it as inadequate is insignificant. The difference between those satisfied with existing programs and those dissatisfied results from accessibility of programs, not basic differences in preference.

Benefits of Continuing Education

Forty percent of the respondents agreed that continuing medical education provides them "an opportunity to be removed from the routine responsibilities of providing medical care." The typical respondent also agrees that CME sessions provide an opportunity to socialize with other physicians. Together with socializing is the opportunity to discuss with other participants the topics presented during the sessions. Although 92 percent of the respondents stated that successfully continuing medical education programs provide an opportunity to ask the lecturer questions, more respondents discuss issues with fellow participants, than address questions to the lecturer. Over 80 percent of the respondents agree that continuing medical education programs provide opportunities for informal gatherings of the attendees. Association

of these aspects with continuing medical education suggests aspects to be considered when developing alternatives to existing education programs.

Slightly more than 50 percent of the respondents agree continuing medical education can be conducted successfully by the staff of the medical facility where they perform their daily responsibilities. In general, physicians are concerned with increasing both their general clinical and specialized technical skills.

A majority of the respondents state that they review the list of lecturers before deciding which conferences to attend. In general, they agree that civilian physicians and military physicians are equally capable of presenting papers. Even more important, the majority prefer to receive instruction from military physicians. A few respondents commented that they prefer military physicians because they are typically better prepared for a presentation, are good public speakers, and understand the military health care system. One respondent suggested that military physicians are very good for those reasons for many topics, but are hampered by a heavy work load and by lack of research time for becoming recognized authorities in highly specialized topics.

Use of Videoconferencing

Respondents were asked to identify their experiences and basic attitudes about teleconferencing. Eighty percent indicated they had never participated in a teleconference. Sixty-six percent stated that teleconferencing offers an acceptable medium for continuing medical education, however, only 20 percent believe it could become a primary means.

Summary of Findings

Responses to the questionnaire indicate that physicians do expect to receive social as well as educational benefits from a continuing medical education experience. A significant majority agree that continuing education

programs include opportunities to meet informally and to discuss the proceedings of the educational sessions. Respondents also prefer a system which provides opportunities for asking the lecturer questions.

The hypothesis that physicians prefer continuing medical education oriented toward their specialty, rather than general medical knowledge, could not be substantiated. A majority agreed with the statements that the primary interest in continuing education programs is improving both general clinical and specialty skills.

The actual use and preference of sources of continuing medical education varies with distance between the physician's institution and adequate sources of continuing education programs. The use of consultants, grand rounds, and specialty conferences does vary significantly among institutions, dependent upon their relative distance from alternative education programs. Physicians assigned to a facility within 44 minutes of a source of adequate continuing medical education are twice as likely to use consultants, specialty conferences, and grand rounds, than those assigned more than 45 minutes from a source. A similar relationship exists between use and preference, and the size of the physician's institution. In facilities with more than 400 beds, physicians tend to use grand rounds, consultants, and specialty conferences more than those physicians assigned to smaller facilities.

Respondents who believe the continuing education system is adequate are twice as likely to use grand rounds, consultants, and specialty conferences, as those who believe the system is inadequate. Respondents expression of preferences does not vary between those who classify the system either adequate or inadequate.

TABLE 3
Number and Percentage
of Respondents by Specialty

Specialty	Number	Percentage of Total
Medicine	221	50.9
Radiology	4	.9
Obstetrics/ Gynecology	23	5.3
Surgery	92	21.2
Pediatrics	44	10.1
Psychiatry	25	5.8
Pathology	22	5.1

TABLE 4
Utilization and Preference of
Continuing Medical Education Programs

Source	Percentage Responding at Least Moderately High Usage	Percentage Responding at Least Moderately High Preference
Four-year colleges or universities	11.7	20.2
State or regional medical associations	9.0	38.3
Professional journals and publications	88.0	89.2
Grand Rounds conducted in the hospital	45.9	72.3
Consultants or other visiting physician	54.6	89.3
Specialty conferences	52.3	88.5
Teleconference system with capabilities to question lecturer	5.6	30.9

TABLE 5
Respondents' Use of Selected Sources of CME,
by Size of the Respondents' Institution

Grand Rounds

Size	Greater than Moderately High Usage	Greater than High Usage
Clinic	10	0
6-24 beds	25	25
25-49 beds	23	8
50-99 beds	19	0
100-199 beds	40	23
200-299 beds	22	9
300-399 beds	53	27
more than 400 beds	58	38

Consultants

Size	Greater than Moderately High Usage	Greater than High Usage
Clinic	30	20
6-24 beds	25	25
25-49 beds	23	8
50-99 beds	29	14
100-199 beds	50	19
200-299 beds	29	16
300-399 beds	69	31
more than 400 beds	68	41

Specialty Conferences

Size	Greater than Moderately High Usage	Greater than High Usage
Clinic	50	10
6-24 beds	50	0
25-49 beds	31	15
50-99 beds	29	19
100-199 beds	27	12
200-299 beds	40	24
300-399 beds	55	32
more than 400 beds	66	41

TABLE 6
Results of Chi-Square
Two-way Tests for Association
Between Use and Preference of each CME Source and
Size of the Respondent's Institution

Source	Actual Usage	Preference
Four-year colleges or universities	0.0000*	0.0489*
State or regional medical associations	0.6423	0.0308*
Professional journals and publications	0.1655	0.0675
Grand Rounds conducted in the hospital	0.0004*	0.0005*
Consultants or other visiting physician	0.0005*	0.0086*
Specialty conferences	0.0001*	0.0201*
Teleconference system with capabilities to question lecturer	0.0815	0.1673

Degrees of Freedom = 42
* denotes values significant at $\alpha = 0.05$

TABLE 7
Respondents' Use of
Selected Sources of CME,
by Distance from Adequate Sources of CME

Grand Rounds

Distance (in minutes)	Percentage Responding Greater than Moderately High Use	High Use
1-14	63	46
15-29	62	41
30-44	49	26
45-59	47	25
Greater than 60	27	10

Consultants

Distance (in minutes)	Percentage Responding Greater than Moderately High Use	High Use
1-14	74	48
15-29	73	42
30-44	53	33
45-59	29	16
Greater than 60	41	17

Specialty Conference

Distance (in minutes)	Percentage Responding Greater than Moderately High Use	High Use
1-14	66	46
15-29	71	45
30-44	44	33
45-59	47	20
Greater than 60	37	16

TABLE 8
Results of Chi-Square
Two-way Tests for Association
Between Use and Preference for each CME Source and
Distance of the Respondent's Institution
from Sources of CME

Source	Actual Usage	Preference
Four-year colleges or universities	0.0748	0.7501
State or regional medical associations	0.2123	0.7024
Professional journals and publications	0.4279	0.1632
Grand Rounds conducted in the hospital	0.0000*	0.0018*
Consultants or other visiting physician	0.0000*	0.3149
Specialty conferences	0.0000*	0.2301
Teleconference system with capabilities to question lecturer	0.9475	0.4452

Degrees of Freedom = 30
* denotes values significant at $\alpha = 0.05$.

TABLE 9
Results of Chi-Square
Analysis of Variance between
Use and Preference of CME by Source

Source	Chi Square
Four-year colleges or universities	149.85*
State or regional medical associations	202.22*
Professional journals and publications	9.83
Grand Rounds conducted in the hospital	89.86*
Consultants or other visiting physician	160.89*
Specialty conferences	166.26*
Teleconference system with capabilities to question lecturer	241.94*

Critical value at $\alpha = 0.05$ is 12.59
Critical value at $\alpha = 0.01$ is 16.81
Critical value at $\alpha = 0.001$ is 22.46

* denotes values significant at $\alpha = 0.001$

TABLE 10
Results of Chi-Square
Two-way Tests for Association
Between Physician Specialty and
Use and Preference of CME Sources

Source	Actual Usage	Preference
Four-year colleges or universities	0.0543	0.1377
State or regional medical associations	0.9433	0.0906
Professional journals and publications	0.1927	0.4778
Grand Rounds conducted in the hospital	0.0193*	0.0000*
Consultants or other visiting physician	0.1032	0.0403*
Specialty conferences	0.2476	0.0002*
Teleconference system with capabilities to question lecturer	0.0548	0.1528

Degrees of Freedom = 49
* denotes values significant at $\alpha = 0.05$

TABLE 11
Percentage of Respondents who
Make Greater than Moderately High
Use of Grand Rounds
by Specialty

Specialty	Actual Usage	Preference
Medicine	52.6	81.0
Radiology	0.0	25.0
Obstetrics/ Gynecology	34.7	69.6
Surgery	44.5	65.3
Pediatrics	31.9	93.3
Psychiatry	52.0	76.0
Pathology	27.3	45.5

TABLE 12
Results of Chi-Square
Analysis of Variance Between
Perceived Adequacy of CME and Specialty

Specialty	Response	
	Adequate	Inadequate
Medicine	155	61
Radiology		3
Obstetrics/ Gynecology	13	10
Surgery	48	43
Pediatrics	25	18
Psychiatry	14	11
Pathology	16	6
Not specified	3	0
	274	152

Degree of freedom = 7

$\chi^2 = 20.348$, $\chi^2 = 18.475$

$p < 0.01$

TABLE 13
Results of Chi-Square
Analysis of Variance
Between Respondent's Specialty
Benefits of CME

Question	Probability	Question	Probability
A	.2692	H	.1495
B	.2572	I	.0615
C	.0666	J	.1331
D	.5918	K	.0773
E	.2876	L	.0548
F	.0706	M	.0002*
G	.1992	N	.7464

* denotes significant values at $\alpha = 0.05$

TABLE 14
Results of Chi-Square
Analysis of Variance
Between Adequacy of CME and
Sources of CME

Source	Actual Usage	Preference
Four-year colleges or universities	0.0019*	.3334
State or regional medical associations	0.0202*	.2634
Professional journals and publications	0.0261*	.3685
Grand Rounds conducted in the hospital	0.0000*	.0060*
Consultants or other visiting physician	0.0000*	.4147
Specialty conferences	0.0000*	.2073
Teleconference system with capabilities to question lecturer	0.2026	.0281*

Degrees of Freedom = 12
* denotes significant values at $\alpha = 0.05$

TABLE 15
Percentage of Respondents
who Reported High or Very High Usage
of Different Sources of CME, by Evaluation
of Adequacy of Existing CME Programs

Source	Percentage of Respondents who Reported Existing Programs are Adequate	Inadequate
College	5	2
Medical Associations	3	1
Professional Journals	64	58
Grand Rounds	34	11
Consultants	38	15
Specialty Conferences	40	12
Teleconferences	2	2

TABLE 16
Percentage of Respondents
who Reported High or Very High Preference
for Different Sources of CME, by Evaluation
of Adequacy of Existing CME Programs

Source	Percentage of Respondents who Reported Existing Programs are Adequate	Inadequate
College	7	11
Medical Associations	13	16
Professional Journals	68	62
Grand Rounds	44	28
Consultants	63	59
Specialty Conferences	66	68
Teleconferences	11	13

III. IMPLICATIONS AND RECOMMENDATIONS

Successful marketing of any program is dependent upon the program's proponents' recognition of the needs of the intended purchaser. Continuing education as envisioned by U.S. Army Health Services Command will be marketed to physicians assigned within the United States, however, each physician will approach the system with particular, preconceived ideas about how he or she will benefit from the program. Alternative systems will be compared and scrutinized. Changes in existing usage patterns will depend upon how well each alternative meets individual needs.

Use of various sources of continuing medical education is largely dependent upon easy accessibility. Institutions located away from alternative sources of continuing medical education should be considered for additional funds. The increased funds should be directed toward low density specialties, such as pediatrics and obstetrics/gynecology, pathology, and so forth.

As expected, there is a large difference between actual usage and preference for various sources of continuing medical education. HSC has no control over the availability of continuing medical education programs from colleges, universities, or medical associations, therefore, efforts to alter these programs will probably prove fruitless. Conversely, the availability of consultants, specialty conferences and teleconferences can be influenced by HSC.

Physicians indicate a willingness to use teleconferencing systems as a means of providing CME, however, their basic expectations of successful CME programs suggest that certain criteria must be included. To fulfill these

criteria it is recommended that, first, teleconferencing be used when the density of the participants is large enough to promote participant interaction between attendees. To be successful at small facilities each broadcast must be oriented toward the interests of several specialties. Conducting programs of interest to individual specialties is not feasible.

Second, the program should provide attendees the opportunity to socialize with one another and to pursue information discussed during the session. Preferably, the lecturers should be military physicians who possess the necessary credentials. Well known individuals or authorities in specific topics would be well received.

Successful teleconferences will provide an easy method to direct questions to the lecturer. The actual use may be minimal, however, the perceived capability is important.

APPENDIX A

DEFINITIONS[1]

Postsecondary Education refers to a learning environment beyond the high school level--formal or informal, credit or noncredit. It includes not only colleges and universities, but also corporations, professional associations, or other organizations that provide postsecondary education.

Telecommunications is the science and technology of communications by electrical or electronic means.

Teleconferencing refers to interactive group communication through an electronic medium. Communication is two-way, rather than "broadcast," allowing interpersonal exchanges. Teleconferencing enables three or more people to interact through an electronic medium that carries audio, video, or test signals--or combinations of them. The basic types of teleconferencing now in use are as follows:

Audio teleconferencing This medium allows group communication by sound only. It is a logical extension of the telephone, with special terminal equipment that replaces the handset to provide "hands-free" usage. The transmission circuits often provide better sound quality than normal telephones. Some systems provide means for identifying the various participants when they speak or for indicating when someone wishes to speak. Audio is the most commonly used teleconferencing medium in postsecondary education today; it is also the least expensive.

Video teleconferencing In a video teleconference, television-like visual signals are complimented by audio information. As might be expected, video teleconferencing is very expensive--at least five times audio costs. A well-designed video teleconference requires careful planning, elaborate equipment, and special transmission facilities to send the video signals.

Computer-based teleconferencing Computers can be used to exchange textual information, as entered by participants through typewriter-like computer terminals. Participants can join a teleconference, see the entries that have been made since they were last present, make their own comments, and leave. Or a whole group can be "present" simultaneously. Computers have been used considerably in individualized instruction. Yet group communication through this medium, usually called "computer conferencing," has only received limited attention within educational environments.

Media mixes A media mix is a hybrid of two or more communications technologies. The use of additional media to supplement audio teleconferencing is widespread. The most common method has been to augment the teleconferencing programming with conventional educational materials such as texts, slides, and supplemental printed handouts of materials pertinent to the course content. In some instances, it is possible for instructors in the central classroom to change slides on view at other sites via remote control. Video cassettes and audio tapes are employed to facilitate teleconferencing programming, and lecturers are often recorded in advance for remote users in the teleconferencing network. Perhaps the most readily available media mix for most educational settings is a remote writing or telecopying device that can send printed pages or diagrams, or allow for a common writing space during the actual teleconference.

FOOTNOTE

[1]Robert Jonansen, Electronic Education: Using the Teleconferencing in Postsecondary Organizations, (Menlo Park, California: Institute for the Future, 1978): vii-viii.

APPENDIX B

SURVEY QUESTIONNAIRE

Please respond to the following questions concerning your attitudes about the usage and availability of continuing education at your current duty station.

Please use the boxes at the right to indicate your responses. Write in each box the number of the response you have selected.

I. In which of the following bed size categories is your hospital?

1. 6-24
2. 25-49
3. 50-99
4. 100-199
5. 200-299
6. 300-399
7. 400 or more

/___/

II. Which of the following most closely approximates the driving time from your hospital to the nearest campus or other location which offers continuing medical education courses or programs suitable to your needs?

1. 1 - 14 minutes
2. 15 - 29 minutes
3. 30 - 44 minutes
4. 45 - 59 minutes
5. One hour or more

/___/

III. Please specify your Special Skill Identifier (SSI), e.g. 61M9B, 61F _____.

IV. Please classify the overall adequacy of continuing medical education programs available to you.

1. Adequate
2. Inadequate

/___/

V. To what extent are you now using each of the continuing medical education sources listed below?

1. Very low usage
2. Low usage
3. Moderately low usage
4. Moderately high usage
5. High usage
6. Very high usage

Four-year colleges or universities..... /___/
State or regional medical associations..... /___/
Professional journals and publications..... /___/
Grand Rounds conducted in the hospital..... /___/
Consultants or other visiting physicians..... /___/
Specialty conferences..... /___/
Teleconference system with capabilities to question lecturer..... /___/

VI. To what extent, given equal access, would you prefer to use each type of continuing medical education program?

1. Very low usage
2. Low usage
3. Moderately low usage
4. Moderately high usage
5. High usage
6. Very high usage

Four-year college or universities..... /___/
State or [illegible] medical associations..... /___/
Professional journals or publications..... /___/
Grand Rounds in the hospital..... /___/
Consultants or other visiting physicians..... /___/
Specialty conferences..... /___/
Teleconference system with capabilities to question lecturer..... /___/

VII. Continuing medical education has different benefits to each individual physician. Using the responses indicated below, evaluate each of the statements.

1. Strongly agree
2. Agree
3. Undecided
4. Disagree
5. Strongly disagree

A. Continuing medical education can be successfully conducted by the staff of the medical facility where I perform my daily responsibilities. /___/

B. Continuing medical education provides me with an opportunity to be removed from the routine responsibilities of providing medical care. /___/

C. Continuing medical education programs provide an opportunity to socialize with other physicians. /___/

D. Successful continuing medical education programs provide an opportunity to ask the lecturer questions. /___/

E. I frequently ask questions to the lecturer at educational programs. /___/

F. I frequently discuss the topics with attendees, rather than address questions to the lecturer. /___/

G. Continuing medical education programs provide opportunities for informal gatherings of the attendees. /___/

H. I prefer to receive instruction from a civilian physician, rather than a military physician. /___/

I. Military and civilian physicians are equally capable of presenting papers. /___/

VII. Continue using these responses to evaluate each statement.

J. When I choose which conference to attend I review the list of lecturers before deciding where to go. /___/

K. I prefer to attend national professional conferences sponsored by my specialty, rather than conferences which emphasize specific skills. /___/

L. My greatest interest in Continuing Medical Education is increasing general clinical skills. /___/

M. My greatest interest in Continuing Medical Education is increasing specialized technical skills. /___/

N. Continuing Medical Education increases the quality of medical care. /___/

VIII. Please indicate if you have participated in a videoconference which permitted you to ask questions telephonically.

1. Yes 2. No /___/

Do you believe that videoconferences offer an <u>acceptable medium</u> for offering CME?

1. Yes 2. No /___/

Do you believe that videoconferences are an acceptable <u>primary medium</u> for CME?

1. Yes 2. No /___/

APPENDIX C

DEPARTMENT OF THE ARMY
LETTERMAN ARMY MEDICAL CENTER
PRESIDIO OF SAN FRANCISCO, CALIFORNIA 94129

REPLY TO
ATTENTION OF:

April 23, 1984

SUBJECT: Continuing Education for Physicians

Dear Army Physician:

As a military physician you are probably acutely aware of the need to ensure the availability of a responsive continuing medical education program which meets our professional requirements. The opportunities must be compatible with our need to develop our medical skills and nurture personal and professional development.

The administrative resident assigned to my organization is evaluating physicians' attitudes toward continuing medical education programs that are available to physicians assigned to Health Services Command. His research provides an excellent opportunity to identify our expectations and needs. Our participation may help guide future HSC continuing medical education programs.

Improved availability of continuing medical education programs to hospitals can only be achieved when Health Services Command has been made aware of the extent of individual physician needs. This survey is designed to meet this objective; to at least in part remedy what the National Commission on Allied Health Education has described as an almost total lack of data in this area.

Please take a few moments to complete this questionnaire and return it in the enclosed envelope. To eliminate follow-up requests, the envelope has been numbered in order that your response can be noted. The information you supply will be held in strict confidence.

I appreciate your assistance. The administrative resident will provide a summary of the survey data if you check the box below.

Sincerely,

FRANK F. LEDFORD, JR.
Brigadier General (P), MC
Commanding

/____/ Please send a summary of your research project to:

Name: _____
Address: _____
_____
_____

APPENDIX D

DEPARTMENT OF THE ARMY
LETTERMAN ARMY MEDICAL CENTER
PRESIDIO OF SAN FRANCISCO, CALIFORNIA 94129

REPLY TO
ATTENTION OF:

HSHH-ZPS

17 May 1984

SUBJECT: Continuing Education for Physicians

Dear Army Physician,

Recently, almost one thousand questionnaires were mailed to physicians assigned throughout Health Services Command. The questionnaire evaluates physicians' attitudes toward continuing medical education programs that are available to physicians assigned to Health Services Command. It provides an excellent opportunity to identify individual expectations and needs.

Hundreds of the questionnaires have been returned, however, we have no record of your response. The questionnaire takes only about four minutes to complete, four minutes which are well spent because it gives you an opportunity to help guide future HSC continuing medical education programs. Your participation is essential if the study is going to be an accurate reflection of physicians' expectations.

Please, take a few minutes to complete the questionnaire and mail your responses as soon as possible.

James L. Stewart Jr.

JAMES L. STEWART, JR.
Colonel, MC
Deputy Commander for Clinical Services

APPENDIX E

SURVEY QUESTIONNAIRE

Please respond to the following questions concerning your attitudes about the usage and availability of continuing education at your current duty station.

Please use the boxes at the right to indicate your responses. Write in each box the number of the response you have selected.

I. In which of the following bed size categories is your hospital?

RESPONSES:

	Size	Respondents	Percentage	Cummulative Percentage
1.	clinic	10	2.3	2.3
2.	6-24	4	0.9	3.2
3	25-49	13	3.0	6.2
4.	50-99	21	4.8	11.0
5.	100-199	52	12.0	23.0
6.	200-299	58	13.4	36.4
7.	300-399	85	19.6	56.0
8.	400 or more	191	44.0	100.0

II. Which of the following most closely approximates the driving time from your hospital to the nearest campus or other location which offers continuing medical education courses or programs suitable to your needs?

RESPONSES:

	Time (in Minutes)	Respondents	Percentage	Cummulative Percentage Percentage
1.	1-14	46	10.6	10.6
2.	15-29	126	29.0	39.6
3.	30-44	61	14.1	53.7
4.	45-59	45	10.4	64.1
5.	60 or more	153	35.3	99.4
6.	No response	3	.7	100.0

III. Please specify your Special Skill Identifier (SSI), e.g. 61M9B, 61F _____.

RESPONSES:

Specialty	Number	Percentage
Medicine	221	50.9
Radiology	4	.9
Obstetrics/ Gynecology	23	5.3
Surgery	92	21.2
Pediatrics	44	10.1
Psychiatry	25	5.8
Pathology	22	5.1

IV. Please classify the overall adequacy of continuing medical education programs available to you.

RESPONSES:

	Classification	Respondents	Percentage	Cummulative Percentage
1.	Adequate	274	63.1	63.1
2.	Inadequate	152	35.0	98.1
3.	No Response	8	1.8	100.0

V. To what extent are you now using each of the continuing medical education sources listed below?

Four-year colleges or universities

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	11	2.5	2.5
2.	Very low	289	66.6	69.1
3.	Low	54	12.4	81.5
4.	Moderately low	29	6.7	88.2
5.	Moderately high	34	7.8	96.0
6.	High	10	2.3	98.3
7.	Very high	7	1.6	100.0

State or regional medical associations

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	9	2.1	2.1
2.	Very low	248	57.1	59.2
3.	Low	83	19.1	78.3
4.	Moderately Low	55	12.7	91.0
5.	Moderately	31	7.1	98.1
6.	High	6	1.4	99.5
7.	Very high	2	.5	100.0

Professional journals and publications

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	4	0.9	0.9
2.	Very low	11	2.5	3.4
3.	Low	10	2.3	5.7
4.	Moderately low	27	6.2	11.9
5.	Moderately high	112	25.8	37.7
6.	High	135	31.1	68.8
7.	Very high	135	31.1	100.0

Grand Rounds conducted in the hospital

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	8	1.8	1.8
2.	Very low	125	28.8	30.6
3.	Low	47	10.8	41.4
4.	Moderately low	55	12.7	54.1
5.	Moderately high	84	19.4	73.5
6.	High	67	15.4	88.9
7.	Very high	48	11.1	100.0

Consultants or other visiting physicians

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	4	.9	.9
2.	Very low	63	14.5	15.4
3.	Low	50	11.5	26.9
4.	Moderately low	80	18.4	45.3
5.	Moderately high	106	24.4	69.7
6.	High	83	19.1	88.8
7.	Very high	48	11.1	100.0

Specialty conferences

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	7	1.6	1.6
2.	Very low	70	16.1	17.7
3.	Low	48	11.1	28.8
4.	Moderately low	82	18.9	47.7
5.	Moderately high	95	21.9	69.6
6.	High	70	16.1	85.7
7.	Very high	62	14.3	100.0

Teleconference system with capabilities to question lecturer

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	17	3.9	3.9
2.	Very low	359	82.7	86.6
3.	Low	34	7.8	94.4
4.	Moderately low	15	3.5	97.9
5.	Moderately high	4	.9	98.8
6.	High	5	1.2	100.0
7.	Very high	0	0.0	100.0

VI. To what extent, given equal access, would you prefer to use each type of continuing medical education program?

Four-year college or universities

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	10	2.3	2.3
2.	Very low	127	29.2	31.5
3.	Low	57	13.1	44.6
4.	Moderately low	58	13.4	58.0
5.	Moderately high	95	21.9	79.9
6.	High	53	12.2	92.10
7.	Very high	34	7.8	100.0

State or regional medical associations

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	8	1.8	1.8
2.	Very low	74	17.1	18.9
3.	Low	65	15.0	33.9
4.	Moderately low	121	27.9	61.8
5.	Moderately high	104	24.0	85.8
6.	High	42	9.7	95.5
7.	Very high	20	4.6	100.0

Professional journals or publications

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	7	1.6	1.6
2.	Very low	3	.7	2.3
3.	Low	4	.9	3.2
4.	Moderately low	33	7.6	10.8
5.	Moderately high	101	23.3	34.1
6.	High	137	31.6	65.7
7.	Very high	149	34.3	100.0

Grand Rounds in the hospital

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	11	2.5	2.5
2.	Very low	29	6.7	9.2
3.	Low	34	7.8	17.0
4.	Moderately low	46	10.6	27.6
5.	Moderately high	146	33.6	61.2
6.	High	99	22.8	84.0
7.	Very high	69	15.9	100.0

Consultants or other visiting physicians

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	6	1.4	1.4
2.	Very low	8	1.8	3.2
3.	Low	3	.7	3.9
4.	Moderately low	29	6.7	10.6
5.	Moderately high	123	28.3	38.9
6.	High	132	30.4	69.3
7.	Very high	133	30.6	100.0

Specialty conferences

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	5	1.2	1.2
2.	Very low	6	1.4	2.6
3.	Low	8	1.8	4.4
4.	Moderately low	31	7.1	11.5
5.	Moderately high	93	21.4	32.9
6.	High	141	32.5	65.4
7.	Very high	150	34.6	100.0

Teleconference system with capabilities to question lecturer

RESPONSES:

	Usage	Respondents	Percentage	Cummulative Percentage
1.	No Response	14	3.2	3.2
2.	Very low	129	29.7	32.9
3.	Low	79	18.2	51.1
4.	Moderately low	78	18.0	69.1
5.	Moderately high	81	18.7	87.8
6.	High	36	8.3	96.1
7.	Very high	17	3.9	100.0

VII. Continuing medical education has different benefits to each individual physician. Using the responses indicated below, evaluate each of the statements.

A. Continuing medical education can be successfully conducted by the staff of the medical facility where I perform my daily responsibilities.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	63	14.5
2.	Agree	158	36.4
3.	Undecided	46	10.6
4.	Disagree	126	29.0
5.	Strongly disagree	39	9.0

B. Continuing medical education provides me with an opportunity to be removed from the routine responsibilities of providing medical care.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	49	11.3
2.	Agree	155	35.7
3.	Undecided	59	13.6
4.	Disagree	115	26.5
5.	Strongly disagree	52	12.0

C. Continuing medical education programs provide an opportunity to socialize with other physicians.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	49	11.3
2.	Agree	264	60.8
3.	Undecided	46	10.6
4.	Disagree	55	12.7
5.	Strongly disagree	19	4.4

D. Successful continuing medical education programs provide an opportunity to ask the lecturer questions.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	152	35.0
2.	Agree	247	56.9
3.	Undecided	24	5.5
4.	Disagree	8	1.8
5.	Strongly disagree	2	.5

E. I frequently ask questions to the lecturer at educational programs.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	62	14.3
2.	Agree	207	47.7
3.	Undecided	59	13.6
4.	Disagree	97	22.4
5.	Strongly disagree	6	1.4

F. I frequently discuss the topics with attendees, rather than address questions to the lecturer.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	31	7.1
2.	Agree	262	60.4
3.	Undecided	52	12.0
4.	Disagree	79	18.2
5.	Strongly disagree	8	1.8

G. Continuing medical education programs provide opportunities for informal gatherings of the attendees.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	64	14.7
2.	Agree	293	67.5
3.	Undecided	38	8.8
4.	Disagree	33	7.6
5.	Strongly disagree	5	1.2

H. I prefer to receive instruction from a civilian physician, rather than a military physician.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	16	3.7
2.	Agree	48	11.1
3.	Undecided	125	28.8
4.	Disagree	185	42.6
5.	Strongly disagree	55	12.7

I. Military and civilian physicians are equally capable of presenting papers.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	176	40.6
2.	Agree	199	45.9
3.	Undecided	23	5.3
4.	Disagree	25	5.8
5.	Strongly disagree	9	2.1

J. When I choose which conference to attend I review the list of lecturers before deciding where to go.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	163	37.6
2.	Agree	189	43.5
3.	Undecided	33	7.6
4.	Disagree	36	8.3
5.	Strongly disagree	7	1.6

K. I prefer to attend national professional conferences sponsored by my specialty, rather than conferences which emphasize specific skills.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	115	26.5
2.	Agree	169	38.9
3.	Undecided	82	18.9
4.	Disagree	59	13.6
5.	Strongly disagree	3	.7

L. My greatest interest in Continuing Medical Education is increasing general clinical skills.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	91	21.0
2.	Agree	212	48.8
3.	Undecided	57	13.1
4.	Disagree	57	13.1
5.	Strongly disagree	10	2.3

M. My greatest interest in Continuing Medical Education is increasing specialized technical skills.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	74	17.1
2.	Agree	176	40.6
3.	Undecided	82	18.9
4.	Disagree	91	21.0
5.	Strongly disagree	4	.9

N. Continuing Medical Education increases the quality of medical care.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Strongly agree	282	65.0
2.	Agree	120	27.6
3.	Undecided	15	3.5
4.	Disagree	6	1.4
5.	Strongly disagree	2	.5

VIII. Please indicate if you have participated in a videoconference which permitted you to ask questions telephonically.

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Yes	81	18.7
2.	No	347	80.0

Do you believe that videoconferences offer an acceptable medium for offering CME?

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Yes	287	66.1
2.	No	123	28.3

Do you believe that videoconferences are an acceptable primary medium for CME?

RESPONSES:

	Evaluation	Respondents	Percentage
1.	Yes	87	24.7
2.	No	316	72.8

BIBLIOGRAPHY

BIBLIOGRAPHY

Publications

American Hospital Association. Satellite Communications: A Guide for Hospitals. Chicago: American Hospital Association, 1983.

Association for Educational Communications and Technology. Learning Via Telecommunications: Readings from 'Audiovisual Instruction'--3. Washington, D.C.: Association for Educational Communications and Technology, 1978.

Boissoneau, Robert. Continuing Education in the Health Professions. Rockville, MD: Aspen Publications, 1983.

Borg, Walter R. and Gall, Meredith D. Educational Research: An Introduction. New York: David McKay Company, 1971.

Johansen, Robert. Electronic Education: Using Teleconferencing in Postsecondary Organizations. Menlo Park, California: Institute for the Future, 1978.

Parker, Lorne A. and Monson, Marvis K. More Than Meets the Eye. Madison, Wisconsin: Regents of the University of Wisconsin System, 1980.

Petrinovich, Lewis F. and Hardyck, Curtis. Understanding Research in the Social Sciences. Philadelphia: W.B. Saunders Co., 1976.

Westmeyer, Paul. A Guide for Use in Planning and Conducting Research Projects. Springfield, IL: Charles C. Thomas, Publisher, 1981.

Stern, Milton R. ed. Power and Conflict in Continuing Professional Education. Belmont, California: Wadsworth Publishing Company, 1983.

Articles and Periodicals

Baird, Marcia and Monson, Marvis. "How to Tackle Training for Teleconference Users." Educational and Industrial Television 14 (August 1982): 45-50.

Broski, David C. and Upp, Sylvia C. "What Allied Health Professionals Want from Education." Journal of Allied Health (February 1979): p 24-26.

Cervero, Ronald M. "A Factor Analytic Study of Physicians' Reasons for Participating in Continuing Education." Journal of Medical Education 56 (January 1981): 29-34

Dolphin, Nancy W. "Why do Nurses Come to Continuing Education Programs." The Journal of Continuing Education in Nursing 14 (July/August 1983): 8-16.

Finkel, Coleman L. "What Teleconferencing can and cannot do for Your Meeting." Management Review 71 (July 1982): 8-15.

Handler, Seymour. "Does Continuing Medical Education Affect Medical Care." Minnesota Medicine 66 (March 1983): 167-180.

Hansell, Kathleen J., Green, David and Erbring, Lutz. "A Report on a Survey of Teleconferencing Users." Education and Industrial Television 14 (September 1982): 70-76.

Kennedy, Maureen S. "Designing and Implementing Successful CE Programs." Journal of Continuing Education in Nursing 14 (November 1, 1983): 16-20.

Laxdal, O.E. "Needs Assessment in Continuing Medical Education: A Practical Guide." Journal of Medical Education 57 (November 1982): 827-834.

Lloyd, J.S. and Abrahamson, S. "Effectiveness of Continuing Medical Education: A Review of the Evidence." Evaluation and Health Profession 2 (September 1979): 251-280.

Manning, Phil R. "Continuing Education: The Next Step." Journal of the American Medical Association 249 (February 25, 1983): 1042-5.

Manning, Phil R.; Abrahamson, S.; Dennis, D.. "Comparison of Four Teaching Techniques: Programmed Text, Textbook, Lecture Demonstration, and Lecture Workshop." Journal of Medical Education 43 (1968): 356-359.

Manning, Phil R.; Lee, Peter V.; Denson, Teri A.; and Gilman, Nelseon J. "Determining Educational Needs in the Physicians' Office." Journal of the American Medical Association 244 (September 5, 1980): 1112-5.

O'Reilly, Patrick; Tifft, Charles P.; and DeLena, Charlene. "Continuing Medical Education: 1960's to the Present." Journal of Medical Education 57 (October 1982): 819-826.

Rost, Mary; Barber, Gerald M.; and Frank, Thomas. "Evaluation of Maine's Telecture Continuing Education Program: Part II." Journal of Continuing Education in Nursing 12 (May-June 1981): 23-30.

Rothenberg, Eleanore; Wolk, Michael; Scheidt, Stephen; et al. "Continuing Medical Education in New York County: Physician Attitudes and Practices." Journal of Medical Education 57 (July 1982): 541-9.

Stein, Leonard S. "The Effectiveness of Continuing Medical Education: Eight Research Reports." Journal of Medical Education 56 (February 1981): 103-10.

Van Eeckhour, Gerald D. "Teleconferencing: a Viable Communications Tool." Healthcare Computing and Communications 1(May 1984): 24-26

Dissertations

Brody, Erwin W., "Continuing Education in Selected United States Hospitals: Administor's Perceptions of Needs and Program Providers." Ph.D. dissertation, Memphis State University, 1982.

Microfiche

Bretz, Rudy, et al. Two Way TV Teleconferencing for Government. Santa Monica, California: Rand Corporation, PB 242-727, 1974.

Chapanis, Alphonse. Human Factors in Teleconferencing Systems. Baltimore, MD Johns Hopkins University, Department of Psychology: PB-268-453, 1976.

Communications Studies and Planning Ltd. Teleconferencing Group Decision Making. London, England: AD-A102 639, 1981.

Communications Studies and Planning Ltd. Teleconferencing Group Decision Making: Designating for Improved Improved. London, England: AD-102 727, 1981.

Hough, R.W. Teleconferencing Systems: A State of the Art Survey and Preliminary Analysis. Menlo Park, CA: Stanford Research Institute, PB-268 455, 1977.

Kropf, Roger and Goldsmith, Seth B. Developing a Continuing Education Program for Health Administrators and Planners. Amherst, MA: Massachusettes University, HRP-0904090, 1981.

Panko, Raymond R. The Impact of Communication Technologies Designed to Substitute for Travel on Scientific on Scientific, etc. Menlo Park, CA: Telecommunications Science's Center, PB-269 669, 1977.

Snead, S.E., and Duncan, L.H. Video Teleconferencing: Conference Mode of the Future. Wright Patterson AFB, OH: Air Force Institute of Technology, AD-A101 717, 1979.

Sticha, P.J., Hunter, C.M., and Randall, L.S. Research into Teleconferencing. McLean, VA: Decisions and Design, Inc., AD-1096 106, 1981.

Sticha, P.J. and Patterson, J.F. Evaluation of Video Teleconference Systems. McLean, VA: Decisions and Designs, Inc., AD-A099 035, 1981.

Tomey, Joseph F. Field Trial of Audio Conferencing with the Union Trust Company, Fairfield University, CA: New Rural Society Project, PB 81-101214, 1974.

Papers

Cable Health Network. "The Professional Program Serices." Mimeograph, undated.

Hospital Satellite Network. "Health Satellite Network." Mimeograph, undated.

Information Paper, HSOP-SP, "HSC-TV Satellite Network." Mimeograph, 9 Mar 83.

Others

Cable Health Network. "Physician's Journal Update," broadcast June 27, 1984.

Getz, Richard. Health Research and Education Trust of New Jersey, Presentation, January 17, 1984.

Santich, Richard. Greater Cleveland Hospital Association, Presentation, January 17, 1984.

Shively, David. Association of Hospital Television Networks, Presentation, January 17, 1984.