Remote Users of Health Sciences Libraries

Phyllis C. Self, Barbara A. Wright, and Jessica L. Waugh

ABSTRACT
Providing information services to remote users is not a new concept for health sciences librarians. Most health care professionals practice in hospitals and clinics remote from a health sciences library. However, trends in today's health care management systems, education initiatives, and the rise in consumerism challenge health sciences librarians to evaluate and extend their services more than ever before using new technologies. This article explores the variety of innovations in service models implemented over the last twenty-five years that health sciences librarians have initiated to extend library services and information beyond the walls of the library.

INTRODUCTION
Gone are the days when a health sciences library was the sacrosanct property of the physician. Describing the increasing use of health sciences libraries by allied health professionals and the lay public, Estelle Brodman (1974) predicted that libraries would need to keep pace with the demands of these consumers, in addition to those of their traditional client, the physician.

Since Brodman’s article, the literature is increasingly concerned with the new definition of the health sciences library user and, of late, much of the attention focuses on the latest breed of health sciences library user—
i.e., the remote user or the person (provider or lay person) who seeks medical information off-site via computer. The expectations of this new breed of user and the accommodations (both traditional and innovative) being made to meet those needs by health sciences libraries as described in the literature will be the focus of this article, in addition to several challenges facing health sciences libraries in their attempts to meet these needs in the digital age.

**WHO ARE THESE "REMOTE USERS" OF HEALTH SCIENCES INFORMATION?**

The people who constitute this class of health sciences library clients include the traditional academic health care provider, such as the physician faculty member; the nonacademic health care provider, such as the community physician or allied health practitioner; and the nonhealth care consumer.

The "Generalist Initiative," in a counter-reaction to medicine's trend toward the reductionist thought dominating medical education, encourages the selection of primary care medicine as opposed to specialty medicine. According to Pruessner, Hensel, and Rasco (1992) generalist medicine would be ideal for the physician willing to accept "all persons and all problems," the doctor with a "taste for complexity, for jagged edges and sudden leaps" (pp. 232, 235). The Generalist Initiative leads to the dispersal of physicians and physicians-in-training to rural areas remote from health sciences libraries in academic health science centers. Because physicians-in-training need someone to oversee training, the initiative also gives rise to a new role for the already practicing rural doctor—i.e., "affiliated preceptor" or the off-campus professional who oversees the experiential educations of health professional students intending to practice in similar rural circumstances. These rural generalists, as well as their students, are in need of ready access to a broad range of medical literature; yet, they are frequently hundreds of miles from the nearest health sciences library.

In today's digital age, the Health Sciences Library must take its cue from the Generalist Initiative for Physicians when identifying its clientele and designing appropriate information access programs. Health science library users can no longer be "reduced" to field physician or academic physician—emerging nonphysician groups in need of information have narrowed the gap with physicians in terms of their medical information needs. Efforts to provide medical information to the non-academically based provider are increasing in numbers; studies such as Ellen Hall's (1995) indicate that nonphysician providers, such as physical therapists, have an increased need for medical information as they branch out from hospital-based practices to private practices. Community health workers, such as public health nurses, need access to information while in the field; outreach efforts on the part of health sciences libraries now attempt to
capture this newer group of clients (Self, Sayed, & Henry, 1997). To satisfy the demands of today's workforce, many allied health degree programs are now being offered as "distance learning" formats (for example, Virginia Commonwealth University, in the summer of 1998, initiated a doctoral program in health related sciences, based on the university’s successful executive master's program in health administration which takes place solely online). Programs like these take into account that the "full time" nonworking graduate student is becoming an anachronism; the population profile trend in higher education is the mature professional who desires higher education but not at the expense of sacrificing employment status. Students of such programs will have information needs transcending the traditional trip to the health sciences library, because most of them will be either physically remote from such structures or consider themselves too enmeshed in daily work needs or family life that taking the time to actually visit the library would be inconvenient or even prohibitive.

Perhaps the last frontier to be explored by the health sciences library is that of nonhealth provider consumer need. The general public, more educated than ever in matters of disease and wellness, is seeking information in areas that Estelle Brodman described as historically restricted to providers. Consider that in the course of an hour-long television drama we might see three pharmaceutical advertisements for prescription medications; obviously, exposure to information once off-limits is increasing exponentially. News magazines and television shows are increasingly sophisticated in their presentations of disease and wellness issues. Today's average citizen can hardly help but be more knowledgeable about health than the citizen of a decade ago. With this barrage of information, the public is encouraged—almost pushed—to question and explore the information resources available. The average public library is not equipped to handle the sophisticated questions generated by the health information advertisements, articles, and news clips found in today's magazines and television shows. So, more and more frequently, consumers are coming to the same information as well as those who provide their care, and health sciences libraries are expected to meet their demands as well.

Perhaps the most fascinating trend in information retrieval involves the element of "convenience" and the idea of time conservation. Studies show us that the health care provider needs information at the patient's bedside or exam table; the doctor is unable to desert a patient to walk or drive to the nearest information source. Now we see that even nonprovider users living within commuting distance to a health sciences library are preferring the comfort of home or the convenience of the office in which to conduct research on health issues. Often called "invisible users" or "disconnected users," these varied clients represent the future, and meeting their needs is a major goal of the health sciences library's mission. Though they are unseen and disconnected, the expectations of remote users are clear.
EXPECTATIONS OF USERS

Through various studies, focus groups, and self-report questionnaires, users tell us that they want services such as free access to the information highway and training on how to navigate the Internet and exploit various software packages.

Studies conducted in rural areas, such as Gerald Lundeen’s (1994) study of the information needs of rural Hawaiian practitioners, highlight problems common to all but the most connected academic physician: equipment shortage (computers, phone service, modems); resources (funds, directories, statistics); time for seeking information; and simply not knowing what information is available and how it might be accessed. Kristen Shelstad’s (1996) report on the information needs and expectations of practicing general surgeons in New Mexico indicated that biomedical literature was considered an important continuing education topic to a majority of respondents, as were learning the new techniques for accessing information. Both rural and urban New Mexico surgeons cited practice demands as a barrier to information retrieval (reaffirming the need for “point of contact” information availability) but also admitted to “computer illiteracy” as a significant hindrance. Shelstad (1996) proposes that “medical libraries need to establish and maintain proactive outreach programs headed by professionals who can make information services available....” (p. 493). This would appear to be the case not only with rural practitioners, but even those a few blocks away from a health sciences library. If we concur that even urban professionals, located close to information resources, prefer the convenience of “point of contact” information access, then the library outreach of the future must include not only outreach programs to remote users but outreach to those close by.

These needs for remote information access do not free libraries from responsibility, however, because these users also want the personal touch—i.e., speedy responses from library staff when questions or problems arise during their explorations in digital information; document delivery services remain in demand by users, remote or otherwise. As with traditional users, remote users also want accurate answers to clinical questions; easy access to medical publications written for highly trained specialists often increases uncertainty and generates more questions for the health sciences librarian. A driving need continues to be “quality filtering” of the mass of information available. What are we doing to meet their needs and expectations?

ACCOMMODATIONS TO REMOTE USERS

Providing information services to unserved health professionals or remote users has been a major driving force for health sciences librarians for decades. Many accommodations to these health professionals have been tried, and simple approaches have been successful. In the early
1980s, the University of Wisconsin-Milwaukee Medical College of Wisconsin Libraries implemented an “Information on Wheels” outreach service program. Much like the public library bookmobile, a mobile cart, loaded with professional books and journals, is taken weekly to the hospital unit and outpatient clinic of the Milwaukee County Hospital and Froedtert Hospital (Glick & Blackwelder, 1986). The driving force behind this innovation was the hospital nursing staff which needed medical information but could not leave nursing stations or patient bedsides to visit the health science library. This technology-free program remained viable and successful for several years after its conception.

For health professionals in nearby clinical sites, two programs which have met with success are the “Literature Attached to Charts” (LATCH) and Clinical Medical Librarian (CML) programs. The LATCH program was established at Washington Hospital Center in Washington, DC, in 1967 to provide specialized information to any health care practitioner attending the patient. The LATCH program provided the services of a librarian to analyze, search, and retrieve relevant literature to assist health care teams in the diagnosis and treatment of patients. This literature was made available to the entire health care team by attaching it to the patient’s chart (Sowell, 1978).

The rise of interdisciplinary teams participating in clinical rounds provided the opportunity for librarians to consider developing a more direct way of disseminating information in nearby and remote clinical sites. Based on the “Clinical Pharmacist” model, the University of Missouri-Kansas City (UMKC) School of Medicine established the first CML program in 1971 through a grant from the National Library of Medicine. Medical librarians began to accompany physicians and medical students on clinical rounds to deliver relevant literature to health practitioners and to participate as active members of the health care team (Gimpl, 1985). Both the LATCH and CML programs have met with varying degrees of success. Although well received by the health care community and implemented at a number of institutions, both programs require ongoing resources that few libraries can afford and few hospitals are willing to financially sustain.

The aforementioned innovative informational programs focused attention on information dissemination to clinic or hospital health care providers who, although geographically within reach of a health sciences library, were unable to make use of the resource because of time constraints and patient acuity issues. If these providers required assistance with medical information services, what were the needs of those in remote areas far from medical schools and health science libraries? Further, might this barrier to information access prove problematic for recruitment and retention of providers in remote, rural, and underserved areas?

Tentative answers to these questions emerged from the Carnegie Commission’s study (1970) “Higher Education and the Nation’s Health:
Policies for Medical and Dental Education” which suggested that a potential reason for maldistribution, recruitment, and retention of primary care providers in underserved areas was due to the provider perception of professional isolation (Carnegie Commission on Higher Education, 1970). Following recommendations in the Carnegie Commission’s study, Area Health Education Centers (AHECs) were established in a number of underserved communities. With the goals of improving accessibility, quality, usefulness, and efficiency of health care providers in medically underserved areas, the AHEC programs employed a variety of educational incentives to attract and retain health care personnel (Fowkes, Campeau, & Wilson, 1991).

During the twentieth anniversary of the national AHEC system, Donald A.B. Lindberg, director of the National Library of Medicine, stated, “we see a natural alliance between the NLM’s mission, as the world’s largest library of health sciences, to provide biomedical information services to the health professions, and that of the AHECs to provide education support for medical practitioners and other health professionals” (Lindberg, 1991, p. 15).

Several states—Arkansas (Wilson 1993), California (Jensen & Maddalena, 1986), North Carolina (Davidson, 1982), North Dakota (Bandy, 1978), and South Carolina (Mangiaracina & Sawyer, 1976)—included library programs as an important component of their AHEC programs (West & Howard, 1977). Faced with limited information resources, these early AHEC library programs were instrumental in forming consortia and other cooperative relationships which became an integral part of the national biomedical information network. When describing the North Carolina program, Thibodeau and Gillikin (1989) state that “the operative words for AHEC libraries are networking and sharing” (p. 697). The North Carolina AHEC Library and Information Services Network has, over time, developed a library network that today includes twelve AHEC libraries staffed with highly trained librarians providing a full range of library services. In their continuing quest to address the health information needs of North Carolina health professionals and students, the AHEC librarians provide training programs in the use of computers and information technology—a role they see as “likely to increase in importance as technology advances” (Thibodeau & Gillikin, 1989, p. 698).

Not all states have been as successful in developing a library network as part of the statewide AHEC program. Consequently, other strategies were developed to meet the needs of the remote user and the goals of the various academic health sciences centers. One strategy to extend health sciences services to community practicing physicians was through membership programs. The first such program was offered by Cleveland Health Sciences Library (Cheshire, 1972) and followed by other institutions like the University of Miami School of Medicine (Williams, Lemkau, &
Burrows, 1988). A similar program supported by grant funding from New York State and its hospital participation fees is the Western New York Hospital Library Services program. The program contracting with the State University of New York of Buffalo’s Health Sciences Library to provide computerized literature searches; interlibrary loan of journal articles, books, and audiovisuals; and interlibrary loan referrals (Birkinbine & Bertuca, 1991).

Perhaps the most innovative program to reach the rural physician was the Circuit Librarian Program initiated by the Cleveland Health Sciences Library under the direction of Robert Cheshier and Sylvia Feuer. Set in northeast Ohio, this circuit librarian program served five community hospitals ranging in size from 48 to 327 beds (Smith, 1976; Shelly, 1977; Feuer, 1977). Equipped with computer, fax machines, and Internet connections, today’s circuit librarians not only search the biomedical literature but provide on-site computing support training for accessing the Internet and NLM’s biomedical resources. Having proven its success, the idea has been managed from academic health sciences centers as well as hospital libraries of various sizes and in many states (Pifalo, 1994). The current Directory of Circuit Librarian Programs indicates that there are approximately twenty-six programs active in 1995 in Canada and the United States (Pifalo, 1995).

Following the birth of the AHEC initiative, several other health education trends were engendered in the late 1970s which would move health care education and the need for library services to remote sites. Developed and implemented more extensively in the 1980s and early 1990s, ambulatory-based health education and problem-based learning integrated clerkships and clinical experiences into medical school and other disciplines’ curricula and encouraged the use of preceptors remote from the academic health sciences centers. These new trends in health care education created the task for both academic health sciences center libraries and hospital libraries in rural areas to address the information needs of a new population of remote users—i.e., preceptors and students at remote clinical sites.

The National Library of Medicine took the lead and addressed the challenges faced by all types of health sciences libraries in reaching remote users in its 1989 plan, “Improving Health Professionals’ Access to Information.” While previous efforts had been placed on networking libraries, this plan sought to improve information access “by NLM and all of the libraries in the Regional Medical Library (RML) network...establishing direct contact with the whole spectrum of health professionals who are the ultimate users of biomedical information services....” (p. 11). As a result of this plan, the RMLs and the libraries in their regions were to act as representatives and agents for NLM information products and services, thereby creating a “field force.”
“access” grants and contracts to help connect the individual user to resources of the national RML network, or newly named National Network of Libraries of Medicine (N/NLM), utilizing modern electronic and telecommunications technologies. In addition, the plan’s recommendations focused on “expanding intramural research and development at NLM, including... the development of new or enhanced information products and services to meet the needs of health professionals” (p. 11). This included accelerating the development of Grateful Med® as a convenient and powerful access vehicle for individual users of MEDLARS®. Further, the scope of DOCLINE® would be expanded through the development of linkages with Grateful Med® which would provide documents directly to health professionals in a timely and cost-effective way through the N/NLM’s interlibrary loan operations. Significantly, the authors of the plan recognized that training health professionals to use technologies, such as Grateful Med®, to search MEDLINE® was an important component of this new initiative (National Library of Medicine, 1989).

For an ever-expanding base of remote users unable to leave offices or hospital units, traditional in-library training sessions were inconvenient at best and impossible to attend for many. The Claude Moore Health Sciences Library at the University of Virginia addressed this problem by offering an alternative to in-library training through a program called “Housecalls.” The “Housecalls” program delivers the library’s regular information management training in an office or departmental setting within the Health Science Center (Feldman & Kochi, 1994). Other institutions (Pifalo, 1994; Mazmanian, Banks, Self, & Hampton, 1997) successfully combined elements of the Circuit Rider Librarian program with teaching Grateful Med® to remote users.

Through NLM’s outreach grants and contracts, librarians have demonstrated the library’s role in health care practice and positioned themselves to be leaders in developing health information systems such as the Texas Tech MEDNET demonstration project. Utilizing interactive telecommunications technology, MEDNET provides physician consultation, medical information transmission, and continuing education to isolated practitioners in over twenty-five rural hospitals. The project librarians are information specialists. They provide information packets containing MEDLINE® searches and relevant articles to support continuing education programs. They are also educational programmers who develop curriculum programs and locate supplemental information resources. Ultimately, they are learning consultants combining various resources in individualized information packets (Moore & Hartman, 1992).

In addition to outreach grants and contracts, the National Library of Medicine offered a series of NLM/NSF Connections grants. The goal of these grants was to encourage expansion of network connectivity and use of the Internet for hospitals and health-related organizations. Combin-
ing this funding with private funds established the Arizona Health Information Network (Anderson, Haddix, McCray, & Wunz, 1994). This project, like others mentioned earlier, demonstrates institutional change and adoption of technology originating from librarians.

Successful projects to reach remote users are built on developing a strong network of resources based on a tradition of successful service. The Georgia Interactive Network for Medical Information (GaIN) is such an example. Established in 1983 through an NLM Resource Project grant to implement a library automation project, today GaIN provides a model network for transmitting health information to over 1,000 health practitioners and an active membership of sixty institutions (Rankin, McInnis, & Rosner, 1995). Many institutions attempted similar projects with varying success to create online services that would bring research materials to remote locations (Algermissen, Helton, & Smith, 1992; Woods & Coggan, 1994).

Thus, developing outreach services in conjunction with an AHEC network is a continuing theme. In 1994, Virginia established its first AHEC librarian position and, in conjunction with that, the Southside Health Information Consortium (SHIC). Serving a thirteen county region, the SHIC circuit rider librarian provided on-site consultation and training and served as an information technology specialist for participating agencies (Banks, Thiss, Rios, & Self, 1997). Also in that year, the Denison Memorial Library at the University of Colorado Health Sciences Center, working with the Colorado AHEC, initiated its outreach program for the growing number of unaffiliated or underserved users thereby taking library services and training to the mountain slopes of Colorado (Muellenbach & Lyubechansky, 1996).

Geographical regions such as the greater northwest face somewhat different challenges than rural states like North Carolina and Virginia. In order to reach frontier preceptors and students participating in clinical sites in the five state region of Wyoming, Washington, Alaska, Montana, and Idaho (WWAMI), the University of Washington Health Sciences Libraries implemented a new partnership in 1996 called the Rural/Underserved Opportunities Program (RUOP) with their health sciences schools. In the RUOP program, students spend six weeks with rural physicians between their first and second year of medical school and serve as teachers to their preceptors to connect and use the Internet (University of Washington, Health Sciences Library, 1996-97 Annual Report). Although using students to reach preceptors shows potential, little to no evaluation has been conducted to measure the success of this service model.

Several health sciences information networks exist to meet the needs of specialty groups of remote users. With the rise of HIV/AIDS cases for example, hospital and academic medical libraries initiated information service programs targeted to health professionals serving the HIV/AIDS populations. Funded by the Virginia Health Department, the Virginia
Commonwealth University established an AIDS Resource Library serving health care practitioners in the six HIV/AIDS Resource Centers throughout the state (Self & Turman, 1995). Recognizing the needs of HIV/AIDS patients and their families to have access to clinical trials and the most current therapeutic information, the National Library of Medicine, for the first time, began to provide monetary awards to projects contributing toward access to HIV/AIDS information. Such diverse entities as the Philadelphia AIDS Information Network, the New North Citizens' Council of Springfield, Massachusetts, and the Southeast Florida AIDS Information Network (SEFAIN) at the University of Miami School of Medicine have benefitted from these funds (Burrows, Perry, Tylman, & Lemkau, 1994).

In 1974, Estelle Brodman stated: “Since health sciences libraries are mirrors of their societies, changes in the outer world cause the same changes in their reflected world” (p. 64). With increased access to health care information, the health care paradigm has been transformed. Consumers are taking a more active role in their health care. A variety of community health information networks have been established to meet the growing need for consumer health information, providing print and audiovisual materials directed to the consumer. Perhaps the most well known consumer health information network established by a health science library is the Ellen Gartenfield Health Information Network (EGHIN) in Miami (LaRocco, 1994). Over time, these networks and library service programs change to deliver information more conveniently to the consumer—i.e., consumer libraries in shopping malls (Goldberg, 1989)—and to use the developing World Wide Web. Building on the phenomenal growth of Web utilization by consumers, two initiatives led by health science libraries capitalized on the Web as a means to deliver information directly to consumers (i.e., MEDWEB <http://www.gen.emory.edu/MEDWEB> by Emory University Health Sciences Center Library and Health Web <http://www.uic.edu/depts/lib/health/hw/consumer> by the Committee on Institutional Cooperation health sciences libraries). Greater use of the World Wide Web is expected to deliver health information to all groups of remote users including health practitioners and members of the public. Managed care and academic institutions see the provision of information services as an important marketing tool. Innovations such as the University of Iowa's “Virtual Hospital” reach across former geographical and institutional barriers and empower consumers to make their own health care decisions (http://indy.radiology.uiowa.edu/).

WAYS THAT SERVICES HAVE BEEN ENHANCED

Health sciences librarians have continued to enhance library services using technology. Even before the development of the World Wide Web, institutions like the University of Tennessee, Memphis, sought to take advantage of their campus-wide network to provide value added services.
Through an electronic menu system, users were able to request photocopies, interlibrary loan, computer literature searches, sign up for workshops, and a variety of other library services twenty-four hours a day (Bellamy, Silver, & Givens, 1991).

Today, health sciences libraries have taken a leadership role in designing systems that incorporate electronic outreach services within the emerging national information infrastructure. Nine libraries in Mississippi developed the Mississippi Health Science Information Network (MisHIN) to develop a statewide multidisciplinary state-of-the-art electronic infrastructure to support the health sciences information needs of all health care professionals in the state regardless of location or affiliation. Headquartered at Rowland Medical Library at the University of Mississippi Medical Center (UMMC), Jackson, MisHIN expansion plans include “developing a coalition of information providers cooperating to increase membership, add new services, provide Internet connections and extend services to all areas in the state.” Libraries play a major role in the development of these electronic networks to disseminate knowledge-based resources and to integrate these resources into the delivery of continuing health professional education (Seltzer, Borland, & Patterson, 1996).

Today's rapidly changing information technology—especially the Internet—is making Brodman's Library Trends article predictions a reality. This is particularly true with the narrowing knowledge gap she noted between the health care professional and the layman. Even the National Library of Medicine has acknowledged this new lay user. In his March 1998 testimony to the House Appropriations Sub-Committee on Labor, HHS, and Education, Donald A. B. Lindberg noted that, in addition to use by traditional health care providers, “the more profound change is that the public—consumers, patients, parents, and other patient advocates—can now use MEDLINE® to learn more about their own health and about how the results of medical research can affect it” (U.S. Congress, 1998, p. 1623).

The development and expansion of the Internet and the World Wide Web have provided health sciences librarians with unexpected opportunities to reach the remote health care practitioner with the use of free Internet Grateful Med® and PubMed®. Released in 1997 by the National Library of Medicine, PubMed® permits the remote user to search the PubMed® database of bibliographic information, which is drawn primarily from MEDLINE® and PREMEDLINE® and links to full-text journals at Web sites of participating publishers. Whereas in the past the remote user was able to search MEDLINE® and request copies of articles from local health sciences libraries which may have taken weeks for delivery, today the remote user is able to obtain articles minutes after conducting a search on PubMed® over the Internet. This database shows great promise for the rural practitioner as well as the health consumer.
In addition to the use of the Web by the National Library of Medicine, health sciences libraries use the Web to disseminate pathfinders, navigational tools, tutorials, and access to their library catalogs and databases. Telemedicine—sometimes referred to as Telehealth—extends the resources of the library beyond its walls and demands partnerships between the library and health care practitioners to provide real time interaction with patients and practitioners using a myriad of multifunctional technologies and high bandwidth distribution systems. Institutions like the University of Cincinnati, collaborating with Ohio State University, Case Western Reserve University, and other partners, developed "NetWellness," a consumer health information service delivered via the World Wide Web, offering a large base of medical experts to provide on-line consumer health information (Guard, Haag, Kaya, Marine, Morris, & Schick, 1996).

**Evaluating Services**

Burnham and Perry (1996) raise questions about the effectiveness of promoting health information via Grateful Med® and Loansome Doc®. There are no long-term studies indicating that health professionals who have received training as part of the numerous grants and contracts offered by the National Library of Medicine continue to use these services once the projects have been completed.

There are limited evaluation studies performed on remote user services. Most are quantitative studies, counts of interlibrary loan transactions, and reference queries. Those studies are based in libraries located within hospitals. The reason for the small number of studies is possibly due to the fact that many reported remote user projects were funded as demonstration projects requiring minimal evaluation reports and usually quantitative studies of document delivery or pre- and post-project questionnaires (Banks et al., 1997; Dorsch & Landwirth, 1993). A more in-depth assessment was performed by University of Texas Health Science Center at San Antonio (UTHSCSA) comparing information use by physicians in two distinct locations—a large, isolated, rural region and a large urban county with multiple medical and research centers including UTHSCSA (Bowden, Kromer, & Tobia, 1994). Common themes emerge in each of these studies.

Remote user services universally are plagued by poor and costly telecommunication connections and lack of on-site technical assistance and support. Initially, remote users lack necessary skills needed to access library services and, once trained, often lose those skills due to lack of use following the initial training. Despite these problems, remote users consider access to information improved through project intervention.

Through a recent NLM-funded project, the National Laboratory for the Study of Rural Telemedicine at the University of Iowa developed an infrastructure to study the use of telecommunications technology in the
practice of medicine in both rural and urban settings. Their studies focused on telemedicine—the use of communications technology in the practice of medicine and the "use of advanced telecommunications to improve access to information, enhance learning opportunities, and achieve higher levels of international competitiveness" (Kienzle et al., 1995, p. 37). Several questions should be answered in the final report. Was the specific knowledge of the provider changed or enhanced by telemedicine? Was there a measurable change (better or worse) in patients' health status, functioning, or quality of life because of the telemedicine application? Is telemedicine a cost-effective alternative to current practice? Is it financially feasible to implement telemedicine on a widespread basis? What factors facilitate or inhibit rural practitioners' use of telemedicine? Finally, does telemedicine help recruit or retain rural health care workers (Kienzle et al., 1995)?

CONCLUSIONS AND NEW CHALLENGES IN THE DIGITAL ERA

As in 1974, health sciences libraries continue to face the challenge of devising new ways to provide information and to keep up with advances. These challenges are faced, usually at higher costs, while maintaining traditional information services and resources for an ever-expanding mix of users. Four major themes challenge health sciences librarians to meet the information needs of the remote user in the digital world: the evolving health care management systems, advances in technology, more demanding informed consumers, and fair use of digital information. Overarching these four themes is the ever-present demand for both librarians and health care practitioners to do more with less, decreasing the amount of time professionals can devote to stay abreast of the latest information and latest technology. Health care practitioners face greater demands to keep abreast of the latest therapeutic modalities while simultaneously keeping health care costs at a minimum. Combined with the growing demand to see more patients, health care practitioners have little time to devote to information seeking and even less time to gain and maintain new information technology skills. The rapid advances taking place in technology compound these problems and challenge even sophisticated users to remain literate with the changes. Further complicating the life of health care practitioners is today's informed consumers coming to them with the latest available research and questioning their treatment plans.

Although this article did not discuss copyright issues, "fair use" of health information is in jeopardy with proposed copyright legislation and poses a new challenge to reaching the remote user. Under "fair use," library users have been able to make copies of an article or a chapter in a book for individual use and study. Information in digital form makes it easier for us to provide information to remote sites but threatens the rights and profits of the creators of information. However, if "fair use" is
discontinued, libraries and users will have to seek permission and pay each time they browse or wish to use a piece of digital information. Our libraries must be able to provide the same level and quality of access to digital health information to health practitioners regardless of location as they have been able to provide with printed materials in the past.

Based on twenty-five years of services to remote users since Brodman’s article, it is clear that there are several elements required for successful outreach initiatives. Outreach projects must begin with a needs assessment based on a strong level of local support. It is best if the outreach program is built on a history of successful prior initiatives or a network that already exists—e.g., AHEC or the N/NLM. The library program should include a package of services that include people, collections, document delivery services, training programs, and an ongoing evaluation program. A service program based on technology must assure the availability of equipment and trained technical staff to assist users around the clock. The rapid advances in technology and telecommunications present major hurdles in delivering information services and resources to remote users. These advances also place increased demands on the knowledge base of users, and librarians challenge them to remain literate with these changes. These are exciting times for health sciences librarians as technology brings new service opportunities and challenges to reach remote users.

**REFERENCES**


