
Health information outreach: the land-grant mission

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Service to the state is one of the core principles of the land-grant mission. This concept of service is also fundamental to a significant number of outreach activities in academic health sciences libraries, particularly those libraries affiliated with the public land-grant universities. The Dana Medical Library at the University of Vermont has a lengthy tradition of outreach to health care providers and health care consumers of the State of Vermont. Building on the foundation of the land-grant institution—which grew out of federal legislation introduced in the mid nineteenth century by Justin Morrill, Vermont's congressional representative—the Dana Medical Library has based its outreach activities on its dedication of service to the state in the promotion of healthy citizens through information dissemination in support of health care delivery. Reengineering library services designed to meet the specific information needs of its diverse clientele, partnering with disparate health care organizations, and relying on fees for service to expand its outreach activities, the Dana Medical Library has redefined the concept of health information outreach for the new millennium.

HEALTH INFORMATION OUTREACH: THE LAND-GRANT MISSION

Arguably, the concept of “outreach” in academic health sciences libraries can be traced to the early foundations of the land-grant college. These institutions received federal support to create an educational foundation for applied sciences, a practical education that would promote economic growth. Most of the notable early health information outreach efforts originated in academic health sciences libraries that were affiliated with land-grant universities and had a strong commitment to serve their state or region. This is not surprising due to the inherently different missions of public and private institutions.

The Morrill Act of 1862, signed into law by Abraham Lincoln, created the land-grant college concept by giving federal land to states to build colleges with educational programs targeting regional development. The legislation was introduced by Justin Morrill, who was a congressional representative from the State of

Vermont. This land-grant tradition of service to the state is as strong in Vermont in the last decade of the twentieth century as it was over a hundred years earlier when Morrill first introduced his bill [1]. This tradition is what fuels the many and varied health sciences information dissemination activities promulgated by the Dana Medical Library of the University of Vermont and Fletcher Allen Health Care.

Vermont and its health care climate

Located in northern New England, Vermont is bordered by Quebec to the north, Massachusetts to the south, New Hampshire to the east, and New York and Lake Champlain to the west. Vermont has a population of slightly more than half a million people, with two-thirds living in towns with populations of 2,500 or less. According to federal guidelines, the state is one of the most rural in the nation. Because of its rural nature and low population base, Vermont is the poorest of all of the New England states.

Vermont's geography is equally problematic relative to access to information. The Green Mountains bisect the state and during the five to six months of winter, only three mountain passes remain open to enable

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traffic to move between the eastern and western sides. Fewer than a third of Vermont's roads are paved, which becomes a major problem for travel during April, a month also known as "mud season."

Vermont has one academic health center, located at the University of Vermont on the eastern side of Lake Champlain. The medical center is composed of Fletcher Allen Health Care (FAHC), the largest ambulatory care center and the only tertiary care hospital in the state, and the College of Medicine and the Schools of Nursing and Allied Health Sciences at the University of Vermont (UVM). While the academic health center provides an extremely high level of tertiary care and is the first center in northern New England to be designated as a Level One Trauma Center, the remaining thirteen hospitals in the state are relatively small, with only two having more than 100 beds, and serve primarily as community hospitals, referring specialty care to their closest academic health center.

There are a number of federally designated areas in the state that are medically underserved. Because of Vermont's rural nature, access to primary care is problematic in some areas and access to specialty care is extremely difficult, sometimes requiring a commute of more than three hours. However, health care providers in the state have an extremely strong commitment to provide the highest quality of health care delivery. Legislation and professional resolve to create a healthy Vermont have prompted a number of endeavors such as the Dr. Dinosaur Program, which ensures access to health and dental care for children under the age of eighteen regardless of the ability to pay. Because of both the problems with access and the determination to keep Vermont residents well, information and communication technology have been employed in many ways to facilitate access to health care and health services support.

Early tradition of service to the state and region

The Dana Medical Library traces its roots to 1820, when one of the physician faculty members of the University of Vermont College of Medicine gave his medical book collection to the college for the purpose of starting a library [2]. As a medical library in a public institution, the collections have always been open to the citizens of the state. However, classic outreach services did not begin until the early 1970s with the receipt of a grant from the National Library of Medicine.

In an effort to mitigate the information access problems caused by lack of hospital libraries in Vermont prior to 1970 and with federal fiscal support, the Dana Medical Library established the Hospital Library Development Services Program. The program was focused both on the development of new hospital libraries and the establishment of a system of cooperation among these libraries to promote information ac-

cess to informationally underserved health care providers across Vermont. By 1975, through the early outreach efforts of the Dana Medical Library and the creation of an outreach librarian position, thirty-three hospital libraries across Vermont, upper New York, and western New Hampshire had trained staff cooperating with each other to share materials and provide information to health care providers [3].

Fifteen years later, this early commitment to outreach, in part through a close working relationship with the Regional Medical Library Program of the National Library of Medicine, had become a part of the core mission of the Dana Medical Library. The outreach librarian had become part of the library's senior leadership, and the Dana Medical Library was poised to provide a national model for health information dissemination in rural areas.

1990s and statewide Integrated Advanced Information Management Systems (IAIMS)

As a way to position the Dana Medical Library for the next millennium and to push the boundaries of information dissemination to health care providers across the state, the mission of the library was revisited, with the strategic direction of the entire academic health center playing a vital and integral role in planning. The health care environment was changing and hospitals were downsizing. Mergers and competition were drastically changing traditional ways of doing business, and they even threatened to undermine the fundamental tenet that rapid access to pertinent health information had an impact on quality health care delivery.

While the 1970s and 1980s witnessed an expansion of health care systems and a growth of hospitals, escalating health care costs in the early 1990s were driving health care consumers and third-party payers to push for change. Although national health care reform was not enacted into legislation, the discussions stimulated action on the part of those involved in health care reform, and the result was significant because administrators no longer supported areas they felt were nonessential. In Vermont, that result translated into downsizing or eliminating virtually all hospital libraries in the state.

At the same time, the UVM College of Medicine and Fletcher Allen Health Care felt the need to react to external forces and affiliate with other health care groups, both primary care and specialty practices, to ensure that they were in a strong position to fend off competition from outside Vermont. Because the Dana Medical Library had a record of both service to the state and neutrality in its position as the only tertiary-level resource library in Vermont, the academic health center viewed the library as an asset to be supported and marketed.

The library, however, could not solely embrace its past record and hope to compete successfully in the changing marketplace. In 1992, it underwent a complete reorganization, adopting total quality management principles and getting rid of the bureaucratic, departmental structure in favor of a clinical academic model [4]. All faculty members taught, worked the reference desk as part of their clinical service obligation, and filled coordinator roles that defined their work responsibilities in the library. Because they were integrated into the educational programs of the health professions schools, they also had specific departmental liaison activities, which defined their teaching and frequently garnered them joint faculty appointments within the liaison departments.

This model enabled Dana to pursue a number of information outreach activities based on a complex matrix of interrelationships developed through resource library support of institutions as well as library faculty support of health care disciplines across the state. The organizational structure grew into what became a statewide Integrated Advanced Information Management Systems (IAIMS) initiative, although without federal funding. Community hospital and health care institutional support took the form of enhanced information services, supplying information to unaffiliated health care providers who lacked access and supplementing services already provided by a viable hospital library. Health care disciplines were supported through affiliations with various professional societies and groups, based in large part on the professional relationships established individually among library and clinical faculty members through the liaison activities.

Reengineering library outreach programs

Health sciences library outreach programs generally fall into three categories: providing information services to those working in health care who are not directly affiliated with the parent institution, providing various levels of information services or consulting to hospitals or other institutions, or providing information to health care consumers. These services range from providing open access to collections to performing mediated searches and providing textual information to fill an information need. The services may or may not have associated charges.

Individuals and groups in the health care domain. Recognizing that information needs vary by type of user and the specific request, the Dana Medical Library modeled its Health Research Affiliates Program after a number of similar programs across the country [5–7]. Membership in the Health Research Affiliates Program offered professionals working in health care access to a variety of resources and services based on

their specific information needs. For an annual membership and a sliding scale of fees, individuals and designated members from defined groups could take advantage of information services and products ranging from photocopying and document delivery to evidence-based medicine short courses and consulting.

Membership fees were determined by the type of profession. Practicing health care professionals who had limited access to other information sources, such as those who had attending privileges at hospitals other than Fletcher Allen Health Care, could become personal health research affiliates for a nominal amount. Although there was a charge for every service, the charge approximated the fee charged to FAHC employees and UVM students, faculty, and staff.

Group practices could become institutional members for a slightly higher fee. A group membership would give the right for all members of the practice to use the services and would entitle the practice to two “library cards” with which members of the group could enjoy the same circulation privileges afforded to affiliates of UVM and FAHC. Nonprofit organizations that supported health care delivery, such as the Vermont Department of Aging and Disabilities or the Visiting Nurses Association, were charged the same as group practices.

Higher fees were charged to individuals who were not health care providers and for-profit groups such as law firms. Services were also assessed at a higher rate. The highest single annual fee was that charged to information brokers. These individuals worked for others to provide information services and products but used the resources of the Dana Medical Library to support their work.

The reduced fees for the various services offered were based on multiple uses by individuals within the various categories of health research affiliates. There were times when only a single service might be needed or several services for a limited time. Every information service provided by the Dana Medical Library, except circulation, was available for a fee. Two examples of the more popular services were Dana Article Retrieval (DART) and Search Plus. DART was document delivery or basic interlibrary loan for individuals.

Believing that rapid access to information, when and where it was needed, could have a significant impact on medical decision making, the DART service for any health care provider in the state was established in the 1970s. Individuals, whether affiliated or not, could call the DART service desk and request articles from the library’s collection. The articles would be delivered to the requested site within twenty-four hours of request.

Search Plus combined mediated searches with the DART service. If someone had a health information need, Dana library faculty performed a database search and selected the two most appropriate articles

from the search that dealt with the requestor's problem. The search as well as the two articles were then delivered to the requestor, again within a twenty-four hour period. In the event of a patient care emergency, either DARTs or a Search Plus could be delivered within a half-hour.

Another form of Dana's outreach that had growing popularity in the health care community involved education and training in information retrieval and critical analysis of information sources. More and more health care providers recognized the need to have rapid access to information and the problems associated with time constraints within their practices. The advent of the Web and patient empowerment made the need for education and training in the use of computer resources all the more critical. For this reason, Dana's faculty actively promoted and provided education and training programs at professional meetings and group practices, as well as organizations of targeted health services professionals.

Hospitals. The Regional Medical Library Program of the National Library of Medicine provided the catalyst to promote health information outreach across the United States, and, as mentioned earlier, the Dana Medical Library had been an active participant in many of its initiatives. Dana served as a Resource Library in the National Network of Libraries of Medicine (NN/LM) since the inception of the program. In the 1990s, it received a number of subcontracts from the NN/LM, New England Region, to promote access to and use of health information resources across Vermont. At the same time, it continued to fulfill its land-grant mission to serve the state by promoting the health of Vermont residents through support of more traditional hospital library services and resources.

In the mid-1990s with the active downsizing of libraries, the Dana Medical Library was approached by the administrations of both FAHC and a community hospital to consider providing outsourced library services, initially to the community hospital but as a model for providing such services statewide. The advantage to the academic medical center was that this service could pave the way for affiliation agreements with small hospitals and health care organizations. The advantage for the community hospital was that it would obtain, through a fee-based contract, high-quality health information services and access to collections that were not available locally.

The concept of academic health sciences libraries providing fee-based information services to offsite or nonaffiliated organizations was not new [8–10]. Both hospitals and academic health sciences libraries had supported circuit-rider programs for more than two decades. What made Dana's program unique, however, was the customization of the various contracts and the

extensive use of communication technology to facilitate information delivery.

Each outsourced library services contract was unique, based on needs of the community hospital. The initial program approximated the more traditional service model, with a Dana faculty member onsite one day a week to perform mediated searches, offer classes in traditional bibliographic instruction, and supervise volunteers in processing materials. Access to information the other four days was accomplished through telephone, mail, or fax requests.

The next contract relied more heavily on technology and gave rise to the concept of the "Electronic Circuit Rider." The onsite visit was limited to once a month, but the use of information was promoted through a number of different venues including electronic discussion lists and telephone decals. The requestor could choose the delivery medium, ranging from fax and mail to upload into an email account. Forms-based email and the Web were alternatives added to telephone and mail for requesting information. Twenty-four-hour turn-around was guaranteed. In two years, the institution quadrupled its use of information resources.

Other forms of outsourced library services ranged from partnerships with an emerging Area Health Information Center (AHEC) program to providing backup for a part-time hospital librarian, who had increased professional reliance on information services to the point that the hospital felt that it needed to provide coverage during vacations and professional meetings. Each contract was custom designed, based on the needs of the institution and its health care providers, with the goal of providing timely and pertinent information in support of quality health care delivery.

Health care consumers. While the Dana Medical Library was neither founded nor subsequently funded by its parent institution to be a consumer health information center, by virtue of being the only academic health sciences library in Vermont, many of its information questions over the years came from the lay public. During the 1990s, it received nominal support from the National Library of Medicine to develop a modest consumer health information collection. However, through recognition of the growing demand for health information by consumers, Dana's mission began to change and enlarge to meet this need.

In addition to the Health Research Affiliates Program, Dana created the Personal Health Affiliates Program. This program provided an annual membership for health care consumers who had need for ongoing medical information about acute or chronic medical problems and needed services beyond those afforded through the university's guest borrowers library card, which was limited to circulation. One information product available to this group was the Personal

Health Information Packet, a specifically tailored package of quality-filtered and educationally appropriate materials for a specific medical problem.

The Vermont Consumer Health Information Project (VT-CHIP) was begun to provide a variety of health information products and services to consumers and consumer groups, ranging from parents of children with special needs to elder-care organizations. VT-CHIP products and services included providing a Web page of consumer health information targeted to the specific concerns of Vermont residents, creating a Prescription for Information program, and marketing information services at meetings and in consumer publications.

Other selected activities in this area included participation in several clinical trials of medical informatics products designed to educate patients about their health care options and active support of the journal, *Consumer Health Reports*. Dana was also integrally involved in many of the activities of the Health Commons Institute, an organization dedicated to promoting consumer access to information to facilitate shared medical decision making between the patient and the provider, leading to improved health care outcomes.

VTMEDNET: harnessing technology and rethinking information access

In preparation for strategic positioning to become the health information provider for the State of Vermont, according to its land-grant mission and the mandate of the academic health center, the Dana Medical Library not only reorganized its human resources but also created new ways of conceptualizing its information dissemination goal. Libraries had long been recognized as the providers of knowledge-based information, but technology was providing the means to disseminate information quickly, not only in a document format but also in a parsed and reconstituted information format as text and even pure data focused to support rapid decision making.

By rethinking its goals and within the changing scope of its activities afforded by developing technologies, Dana became a leader in the creation of VTMEDNET, the first comprehensive statewide health information network in the country [11, 12]. For the first time, health care providers, regardless of their location or affiliation, could have rapid access to information. The active use of the system reached 60% of all physicians in the state within its first year of operation, and its remarkable success was predicated on meeting the health care providers' needs, identified through needs assessments and partnerships with strategic organizations.

Although the Vermont State Medical Society, the Vermont Hospital Association, and the Vermont Health Care Authority provided support to end users, pro-

moted activities, and named members to serve on the steering committee, FAHC financially supported and managed the network server and telecommunications access. It saw VTMEDNET as a means to link initially physicians and later other members of the health care community to a statewide intranet to improve the quality of health care delivery through access to information. While FAHC administered the network, the Dana Medical Library was responsible for information dissemination, discussion list administration, account authorization, and creation of an efficient and effective electronic environment of health information serving those who provided health care to the citizens of the state.

In addition to email, health care providers wanted access to traditional library resources, and email became the vehicle to upload and transmit the results of MEDLINE searches and even scanned full-text articles in the event of a health care emergency when a fax was not available. However, the information needs extended beyond those of the traditional access to knowledge. Through partnerships, Dana was able to acquire and mount, initially on a Gopher server and later using Web technology, state government updates on pending health care reform legislation, utilization data from the Vermont Hospital Association, and, working closely with the Vermont Department of Health, periodic alerts on infectious disease outbreaks.

Health care information outreach activities for the Dana Medical Library in the 1990s had moved beyond traditional "on-demand" support of hospital libraries, information services for unaffiliated health care providers, and information access for health care consumers. Partners in the proactive dissemination of parsed information and data translation across the State of Vermont included the Vermont Program for Quality in Health Care, the Vermont Department of Aging and Disabilities, and a significant number of other institutions who recognized the value of having an academic health sciences library manage information in support of health care delivery. For the first time, information outreach in Vermont had begun to realize its full potential within the land-grant mission of the Dana Medical Library.

The land-grant mission and health information outreach beyond the year 2000

Health information outreach in the State of Vermont, like many programs across the country, is entering the next millennium at a watershed period. Vermont's only academic health sciences library was nurtured by the state's land-grant heritage. Health information outreach is central to its mission. However, the basic concepts of library service and resource format are changing. Teaching hospital librarians the nuances of DOCLINE to enable them to continue to provide free in-

terlibrary loans without regard to the variable of time does hospitals and health care professionals a disservice. Performing mediated searches in support of health care delivery without timely access to full-text information does not meet the true "outreach" mandate of timely access to health information in support of clinical decision making. Even using technology to "push" parsed information is only effective if health care providers have the information base into which they can assimilate the presented information.

Libraries need to begin to reorder their priorities. They need to view themselves as the link between information needs and information, regardless of the format of the information or the affiliation or the location of the user. They need to move from ownership to access, disseminating information when and where it is needed, supported by a revenue stream from their services and products. They need to seek new partnerships, both inside and outside their parent organization, to ensure that information outreach becomes ubiquitous to their mission, regardless of whether the user is in a room next door, across the street, in the next city, across state lines, or even in another country.

Most health sciences libraries are active users of the Web and create and link Web pages to promote access to information. However, libraries need to explore their roles in the creation and use of other information dissemination tools. The Dana Medical Library, through its Health Research Affiliates Program, is actively involved in supporting the development of, medical student training in, and research on a clinical decision software product called Problem Knowledge Couplers [13]. This is an example of a partnership that takes knowledge-based information and reformats it to meet the information needs of providers in today's health care delivery environment.

Another vehicle of health information outreach is telemedicine. While telemedicine is essentially an enhancement on the telephone system, its technology enables health care providers to interact with patients at great distances. This real-time interaction permits the exchange of information between patient and provider. Tools for decision support and real-time access to knowledge-based information will provide a more efficient and effective interaction, thus enhancing the health care encounter. Libraries need to take a leadership role in envisioning this emerging form of information outreach. Again, the Dana Medical Library, through its work on the international "Information Connection" annual conferences sponsored by the University of Vermont and Fletcher Allen Health Care, has been actively involved with the telemedicine program at FAHC, recently named by *Telehealth Journal* to the Telemedicine Hall of Fame as one of the longest running top-ten telemedicine sites in the country [14].

The Dana Medical Library is committed to health information outreach. It is a product of the land-grant

vision of Justin Morrill. It is a vital asset of an academic health center determined to maintain its role as the primary health care institution in a small rural state. It has a tradition and reputation of providing high-quality information services in support of health care delivery across Vermont and has been nationally recognized for its innovative activities in health information dissemination to rural health care providers [15]. However, the Dana Medical Library, like other academic health sciences libraries across the country, is only now beginning to recognize and embrace the challenges and opportunities of providing access to health information in the next millennium, not only when and where it is needed, but in the format—data, parsed text, filtered knowledge, image, and so on—that will be most useful to the health care provider. This is the next goal in the redefinition of the land-grant mission of health information outreach.

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