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# **Evolving roles of life and health sciences librarians for the twenty-first century\***

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The twenty-first century will provide exciting challenges for life and health sciences librarians that will force us to redefine our position in the world of information. This rapidly changing environment influences the profession in a variety of ways including whom we serve and through what services, how and where we practice librarianship, and even the very composition of the profession itself. We must look at the changes in society and make the appropriate reciprocal changes in how we educate future librarians, how we market the profession, and how we develop the profession as a whole. We, as life and health sciences librarians, need to meet these challenges head on in order to continue the evolution of the profession well into the twenty-first century.

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## **INTRODUCTION**

Since 1900, society has been profoundly affected by the development of technologies such as the combustion engine, the car, the airplane, rockets, electricity and electronics, space exploration, the telephone, radio, television, computers, and nuclear energy. Try to imagine our lives today without these discoveries.

The twenty-first century promises the same level of development in the biological sciences. Today, biotech companies are developing engineered plants and animals and labs are producing bacteria that digest oil spills. Researchers are rediscovering cures for diseases using tropical plants and developing cures for other diseases through genetic manipulation. We now have the visible human and the human genome projects, which are already affecting our society in ways we are only beginning to realize. These projects have demonstrated tremendous potential, but also pose as yet unresolved and even unrealized ethical quandaries.

This exciting and unsettling environment is influencing the health sciences information management professions in how they practice, whom they serve, where they practice, what services they provide, and the composition of the health information professions.

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## **ENVIRONMENTAL TRENDS**

Tremendous medical advances have taken place and will continue during the next century. However, provision of quality health care to all may be more difficult as control of health care provision rests in fewer and fewer large health care management networks. Networks increasingly focus on cost containment issues sometimes at the expense of quality care. The large managed care networks, however, need to integrate vast amounts of data across a broad continuum of care and among many different providers, making the management of information a powerful tool in improving care and containing costs. This information management need is also driving the need to develop a computerized patient record. The importance of knowledge-based information in providing quality patient care may not be universally recognized, however. More studies are needed that demonstrate a relationship between access to reliable and timely health care information and positive patient outcomes.

As a result of economic considerations, hospitals are either downsizing, being absorbed by larger health care management organizations, or closing altogether. Downsizing frequently means the loss of library positions and the services of a professional health sciences librarian. The paradox here is that while there are increasing amounts of information to manage, members of the very profession who are trained experts in accessing and managing information are losing their jobs.

New technologies have dramatically changed the

practice of medicine and the practice of health sciences librarianship. Telemedicine, with its ability to provide immediate access to expert health consultation for a physician in a rural area, was not possible until clear visual images could be transmitted over the Internet. The High Performance Computing and Communications Act (HPCCA) created an interagency program to "speed the development of massively parallel, scaleable computing systems; ensure connectivity through telecommunications, the creation of parallelizable computer programs, and the education of users in these technologies" [1].

The HPCCA provided the platform for the National Information Infrastructure and its spin-off, the Health Information Infrastructure (HII). Ideally, HII will be accessible to all and include useful healthcare applications such as telemedicine, the development of digital libraries, and both formal and continuing education opportunities. The National Library of Medicine is developing the Unified Medical Language System (UMLS). UMLS is mapping "concepts and terms from many different biomedical vocabularies and classifications and providing machine-processable descriptions of the contents of health-related databases" [2]. These efforts will increase efficient access to the information intensive environment of the medical field.

The issue of problem-based learning with its emphasis on learning how to learn and evidence-based practice has also affected the teaching and practice of medicine and the knowledge and skills that a health sciences librarian must possess to take advantage of future professional opportunities. For example, Satterthwaite et al. [3] found that a problem-based learning curriculum resulted in students spending more time in the library concentrating on learning issues and locating information sources. These activities led to increased contact by librarians with college of medicine faculty and required the librarians to demonstrate group facilitation skills as well as knowledge of learning theory, curriculum development, instructional methodologies, and other teaching skills to be able to fulfill an enhanced educational role.

The emphasis on preventive health care and consumer health is another environmental force influencing both whom health sciences librarians serve and how they serve them. Various online libraries of health information are being developed for the end user, in this case the consumer, that not only contain digitized print material, but access to databases and health experts online. NetWellness, developed by the University of Cincinnati Medical Center in collaboration with several other partners, is one of many examples. For-profit groups such as IBM have developed similar consumer health packages and academic health centers are forging partnerships with other for-profit companies to drive the tremendous growth of health information available over the Internet.

Finally, regulations and standards also impact the profession. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) accreditation standards for information management in hospitals and managed care networks directly influence the perceived importance of knowledge-based information in the overall information management function of a hospital. State licensure requirements currently prohibit the practice of medicine across state boundaries, negatively impacting the development of telemedicine programs. Proposed copyright restrictions in the digital environment are significantly affecting distance education initiatives.

## IMPACTS ON THE PROFESSION

How have these environmental trends impacted our profession? Cronin, Stiffler, and Day [4] found that although over half of the Indiana employers offering employment opportunities for librarians still wanted employees to have a master's degree in library science, in many job listings the master's in library science had to be combined with a science, business, or journalism degree. Others required a medical degree or doctor of philosophy in computer science or similar specialties, having decided that the master's in library science was not relevant for their information positions. Medical Library Association placement data from 1993 indicated that 53% of librarians applying for positions in the health sciences librarian field had undergraduate training in the sciences, technology, and social sciences compared to 32% of those librarians already practicing in the health sciences librarian specialty.

The author compared *MLA News* job listings from 1977/78, 1986, and 1996. In 1996, new job titles appeared including systems services director, electronic services director, education/curriculum specialist, and information technology coordinator. These titles were nonexistent in 1977/78 and only systems services director was mentioned in 1986 listings. By 1996 job listings titled public services, audiovisual services, and extension services had almost disappeared. That did not mean that the knowledge and skills required for these jobs were not needed. Rather, the knowledge and skills were frequently combined under an administration or planning job title, a title whose frequency of appearance increased 20% from 1977 to 1996.

New knowledge and skills appearing in 1996 job listings reflected the environmental trends discussed above. Nearly 44% of the job listings in 1996 required Web, Internet, or information systems knowledge whereas none did in 1986. The ability to instruct or teach was mentioned in 47% of the listings, an increase of 13% over 1986. The top three knowledge or skills requirements in 1986 were online searching, knowledge of automated systems, and supervisory skills. In 1996, the top three were instruction and teaching

skills; Web, Internet, or information systems knowledge; and reference skills.

Other studies supported these trends. Wakely and Foster [5] observed that over 50% of hospital libraries studied had implemented bibliographic instruction programs and almost 40% offered patient and consumer information services as of 1990. Other new services included end user training, clinical librarian services, microcomputer center services, and computer-assisted instruction programs. Leatherbury and Lyders [6] found that between 1982 and 1989 end user searching had increased in academic health center libraries and end user training had increased to meet the users' needs. This paralleled a general decline in librarian-mediated database searching, especially of the National Library of Medicine databases. They also found a 60% increase in reference desk activity.

Anderson [7] reflected this changing environment in her 1989 Janet Doe lecture, noting that librarians in the future need knowledge about information technology and database design, management abilities and demonstrated leadership qualities within the institution to position the library effectively, and to have an understanding of how information was used within the entire organizational context.

## EMERGING PROFESSIONAL ROLES

Where then is the profession going as it journeys into the twenty-first century? Matheson [8], when speaking of the transformation of the library, noted that "In the twenty-first century, the idea of the library will be a knowledge server, an encyclopedic source of knowledge, the encryption of what is known of civilization, culture, and the organization of the universe. . . . These knowledge sources, some of which will still be called libraries, must be dedicated to information and to knowledge." Lucier [9] believed the librarian's role should include the transfer of information and the creation of the networked digital library for information access and dissemination, and that the librarian and library should be integrated more fully into the scholarly and scientific communication process, resulting in a new role called knowledge management.

In 1992, the Medical Library Association published its educational policy statement, *Platform for Change* [10]. The report's recommendations were based upon a survey done by Roper and Mayfield [11] of knowledge and skills deemed to be important by health sciences librarians. Seven areas of knowledge were identified from the survey, including health sciences environment and information policy; management of information services; health sciences information management; health sciences resource management; instructional support systems; information systems and technology; and, research, analysis, and interpretation.

Several other knowledge and skills studies have been published in the 1990s. Ash [12] studied the impact of integrated advanced information management systems on the work of information experts and Guise et al. [13] surveyed knowledge and skills librarians need to meet the challenges of today's health care environment. These studies, along with Roper and Mayfield's, listed the following as important for the successful practice of health sciences librarianship: oral and written communication, computer database searching, telecommunications or networking, ability to work in teams, knowledge of health practitioners' needs, developing services to meet needs, common sense, willingness to learn, flexibility, personnel management, retrieval techniques, health sciences information sources, and computer software.

Where are health information professionals working today? Detlefsen [14] identified the following employment sites for health sciences librarians: schools of medicine and other health-related schools, academic libraries, clinical care facilities, other health care entities accredited by the JCAHO, pharmaceutical companies, health insurance companies, public libraries, associations, community organizations, drug information centers, poison control centers, indexing and abstracting services, medical publishers, vendors of library services, and vendors of health information. Independent information brokers and marketing departments in organizations that do business in the medical field should also be added to the list.

Cronin, Stiffler, and Day [15] describe this panorama of employment opportunities as having three levels. One employment market is the heartland where the traditional library and information units are found. Another market, the hinterland, includes libraries without walls and distributed information systems. The hinterland may employ the database coordinator, information manager, or information broker. The final market is the horizon where research and development of hardware and systems are explored. For some time health sciences librarians' futures will be in all three markets, intersecting and connecting in infinite variety, much like the Internet.

Health sciences librarians must be able to convert information into knowledge for the clients they serve to make some sense out of the endless stream of data rolling along the information highway. Members of the profession will continue to provide knowledge-based information to the practitioner, the educator, the student, the researcher, the patient, and consumer, but may also be significant partners in managing institutional information networks. Health sciences librarians must also create these databases and networks, be able to integrate a variety of information types in multiple formats; and then link all the information to promote quality medical decision-making. They must continue to educate their clientele in the use of the new hard-

ware and software technologies and broaden their view of whom they serve to include consumers. They must understand that points of service for health information may include the shopping mall or consumers' homes via the Internet. Health sciences librarians must also expand their information focus to include not only health information, but any information that will assist their institutions or organizations in meeting challenges in the twenty-first century. They must also work to integrate other types of libraries including public libraries into the health information stream so that they can create a health care information distribution network with a variety of partners and outlets. These new roles will require that librarians function at the more complex levels of the profession, leaving routine tasks to others.

### OBSTACLES TO PROFESSIONAL EVOLUTION

What are some obstacles to this professional evolution? Competition is one very real obstacle. Abbott [16] states that professions who do routine work are vulnerable to incursions and such work is an obvious target for deprofessionalization. Lack of perceived value of our profession by outsiders is another. Abbott notes, "professions are increasingly vulnerable to loss of jurisdiction if their results cannot be clearly measured, their treatments are general and do not help the problem." A Special Libraries Association task force report [17] studying the value of the information professional found that the invisibility of the work of the information professional adds to its general lack of appreciation and low valuation, corroborating Abbott's view.

Public perception of the profession can be another obstacle. This public can be supervisors, a board of directors, or hospital administrators. According to Abbott [18], the public seems to remember professions in a first impression image and that image remains fairly stable. For most people, that first library experience is with a school or public librarian and the practice of these library specialties differs significantly from the practice of health sciences librarians.

In the past, librarianship has been place-based. However, in the electronic environment place limitations are less important, opening up the field to those trained in areas other than library and information sciences. The profession must continually develop ways to overcome these and other obstacles.

### CONCLUSION

To fulfill these evolving roles in this ever-changing environment, health sciences librarians will need several qualities. These include the ability to collaborate and work in teams successfully with other information professionals both in- and outside their organizations; an entrepreneurial spirit to aggressively develop and

market client-centered information services in- and outside their organizations; the flexibility to realize that the librarian's role must seek validation through a body of knowledge and skills that creates knowledge rather than through working in a place such as a library; the desire to mentor to give new professionals and pre-professionals training opportunities that go outside the traditional library school curriculum, promote the value of the profession, and place qualified professionals in places of responsibility; analytical skills to transform information into knowledge; and people skills to provide those seeking health information a non-threatening human contact, a human touchstone in the electronic maze of medical terms and therapies. Finally, health sciences librarians must have a global outlook and foster that outlook in others as our global village continues to shrink.

Health sciences librarianship has traditionally been a service profession. As the profession moves into these new and ever-evolving information roles and into this era of information entrepreneurship, the information economy will inevitably result in a change in the profession's value systems. The author hopes the principles that are embodied in the Medical Library Association's *Code of Ethics for Health Sciences Librarianship* [19] will not be abandoned. Access to information for all, working without prejudice to meet clients' needs, ensuring the best available information is provided, leadership in not only the design and development but the ethical management of knowledge-based information systems, upholding the philosophy and ideals of the profession, advancing the standards and other principles that are core values of the profession. These professional values differentiate health sciences librarians from others engaged in the provision of health information and represent a value-added dimension the profession brings to this noble endeavor.

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