Also see Introduction on p.202, Essays, Vol:9

The Impact of Health Information Delivery on the Quality of Patient Care: Whither Medical Information Science?*

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(Continued from last week)

Edward J. Huth, editor, *Annals of Internal Medicine*, proposes that pressures for keeping updated can be offset by getting information for the immediate problem at hand. He suggests that much of the investment in postgraduate courses might be more effectively spent in providing better hospital libraries.[14] Howard S. Barrows, Southern Illinois University School of Medicine, Springfield, worries that medical schools make students memorize but do not emphasize problem-solving skills. He encourages a "problem-based, self-directed learning"[15] that will provide medical graduates with a way to keep up with continuing education through self-directed, information-seeking skills.

The GPEP report, mentioned earlier, agrees with the need to shift educational emphasis. "Medical faculties have thought it imperative that medical education keep pace with biomedical science and have expanded the base of factual knowledge that students must commit to memory. By this concentration on the transmittal of factual information, faculties have neglected to help them acquire the skills, values, and attitudes that are the foundation of a helping profession."[3]

Hospital Library Resources

A variety of learning resources that can help develop these information-seeking skills can be provided by the hospital library. So, in addition to being invaluable for current information needs and cost-effective diagnostic decisions, as well as second opinions, the hospital library can also provide alternatives to formal continuing medical education courses.

The modern hospital library can offer a variety of resources and programs to enhance its services. For instance, PaperChase, developed by Gary L. Horowitz and Howard L. Bleich, Beth Israel Hospital, Boston, is a computer-based bibliographic information-retrieval system designed to permit computer-ignorant users to search for medical literature. The original PaperChase system has a database of 400,000 references found in the hospital library. Terminals are located throughout the hospital for use any time, day or night.[16] These same terminals are used to obtain other medical and patient information. This is part of a much larger program of computerization. The library service is piggy-backed onto a major program of medical informatics.[17]

This system has been very popular and is being adopted in other hospitals. It has proved simple to use, and the average search takes about 11 minutes.[18] A more recent version of PaperChase expands its coverage to the complete MEDLINE file. PaperChase is not unlike a system developed at Washington University, St. Louis, Missouri, where they have recently put *CC* online. This is the first US test site at a medical school. However, a comparable system has been available at the Imperial Cancer Research Foundation in London for several years.

Clinical Medical Librarians

PaperChase is only one of the available library options to improve information exchange between the doctor and the library. The first clinical medical librarian (CML) program was developed by Gertrude Lamb, then of the University of Missouri (Kansas City) Medical Library. A CML attends medical rounds as part of a health-care team to learn about case problems. As a result of direct or perceived requests by physicians, the CML does an information search and gets the information to the doctor immediately so that it can be used on a particular case.[19] This program has been so successful that it has sparked many other programs across the US, in Canada, and here in the UK.

Agnes A. Roach, Health and Hospitals Governing Commission of Cook County, Illinois, and Whitney W. Addington, Division of Pulmonary Medicine, Cook County Hospital, found that the services of a clinical librarian improved both patient care and education by making current information accessible to the health-care team. Furthermore, the health-care team learned how to use the library while becoming aware of its potential in the health-care setting.[20]

In addition to increasing awareness, Scura and Davidoff found that as a result of information provided by a CML program at the University of Connecticut Health Center, the course of patient management was affected in 20 percent of the cases.[6] This compares favorably with the results of diagnostic tests. Richard H. Dixon and John Laszlo, Duke University Medical Center, Durham, North Carolina, found that only 5 percent of the routine laboratory testing, such as blood tests and X rays, actually affects the course of treatment.[21]

A CML program at McMaster University, Ontario, Canada, uses a half-time librarian to rotate through different health departments for a short time. The emphasis is to teach health professionals information skills for future use. Studying the effectiveness of this program, Joanne G. Marshall, health sciences librarian, and Victor R. Neufeld, Department of Medicine, McMaster University, found that health professionals changed their perceived value of the literature search in patient care. Even after the CML left, health professionals continued to request MEDLARS searches and to use the research librarian more often than before the CML program.[22]

This last point is one I have stressed quite often when discussing librarian fears of automation. Far from displacing information professionals, microcomputers have increased the value of, and demand for, librarians. Once a physician has learned how to do his or her own unified searching, he or she is in a much better position to ask the help of a respected library colleague to execute a search as a surrogate. Understanding the limitations and possibilities of the system makes the physician a better client.

In addition to meeting the information needs of health professionals, the CML program at McMaster University is slightly different in that it extends library services to patients and their families. This reflects recognition by the medical community of the consumer's growing participation in health care and the individual's right to make informed decisions about care and treatment. In an interview with Carol Fenichel, Seymour I. Taine, former editor of *Index Medicus*, forecast that this was an inevitable consequence of an information-conscious, information-literate society.[23]

Patients and families accounted for 24 percent of the requests from the McMaster library. These requests for information were used to develop 10 information packets carefully checked by health professionals for accuracy. Patient response to these packets was enthusiastic—more than half of the questionnaire respondents noted that the information supplied was new and informative.[22] Another option is the kind of consumer health information programs that involve interlibrary cooperation between public libraries and medical libraries as described by both Ellen Gartenfeld, Mount Auburn Hospital Community Health Information Network, Cambridge, Massachusetts,[24] and Eleanor Y. Goodchild, then at Los Angeles County Harbor General Hospital, Torrance, California, and colleagues.[25]

I also believe that providing information services to patients will make it possible for doctors to share these costs. As a consequence, doctors will also have to be more open in discussing the possible treatment choices. This will happen more slowly in Europe, where the patient-doctor relationship is still more traditional.

Seven years ago, Bette Greenberg and colleagues, Yale University, evaluated the Yale Medical Library CML program to learn if its objectives had been met. Using a scale of one to four—with four being best—an average score of 3.45 was obtained from clinicians favoring the relevancy of information provided by the CML. In addition, the overall mean response for the time-saving ability of the CML program was an overwhelming 3.88. This evaluation showed that the CML program is time-saving, cost-effective, and has multidimensional benefits in a patient-care setting.[26]

A CML program patterned after the one developed at the University of Missouri (Kansas City) Medical School was initiated at the Department of Surgery, Guy's Hospital, London. Like the programs in the US, this pro-

gram received a favorable response from most participants and improved the use of literature-search facilities. However, differences between health-care practice in the US and UK made the London program not quite as successful as its US counterpart.

Anne Wilkin, librarian, and Ian McColl, professor of surgery, Guy's Hospital, believe that American surgeons are more conscious of the literature than their British counterparts. Moreover, because there is only one surgeon for every 59,000 people in the UK—compared with one surgeon for every 5,900 people in the US—on average, American surgeons perform fewer operations than British surgeons and thus tend to have less practical experience.[27] I might add, however, that many European scientists believe that Americans know only the English-language literature, while anything in French or German, for example, is shunned. However, this has not been documented, and it is worth noting that a remarkable number of American and Canadian physicians are foreign-born.

Since the pattern of information demand by UK practitioners differs somewhat from that in the US, in order for a clinical librarian program to be more successful in the UK, it will have to diverge from the US prototype to more closely match the UK's own special needs.

The LATCH Program

Another option provided by the hospital library is a program called Literature Attached to Charts (LATCH). Created at the Washington Hospital Center, Washington, DC, in 1967, this program provides a package of information tailored to a patient's case, attached directly to the patient's chart.[28]

LATCH's development was based on two assumptions. First, that improved medical care will occur if the attending health professionals are aware of the recent, case-specific literature. Second, the library can help hospital staff to become more familiar with medical literature by placing it near the patient to whom it relates.[28]

The LATCH process is actually very simple. After a physician requests information on the patient's chart, the unit clerk relays the request to the library. A case-specific information package is prepared and attached to the patient's chart. After the patient is dismissed, the LATCH is cataloged in the library for future reference.

At the Washington Hospital Center Medical Library, the LATCH experience was studied between the years 1968 and 1975. It was found that LATCH was often used to educate new physicians. Attending physicians and staff nurses accounted for only 20.1 percent of requests, while interns and first-year residents accounted for 68.5 percent of requests.[28] Results also showed that the LATCH program was very popular—71.8 percent of its users termed LATCH "very useful," 25.2 percent found it "moderately useful," and only 3.0 percent termed LATCH "not useful."[28]

Both a CML program and LATCH are used at Framingham Union Hospital, Massachusetts. Sandra R. Clevesy, director of Library Services, attends morning rounds to review cases of newly admitted patients.[29] At this time, the information needs of the health team are discussed. More than half of the patient-related inquiries made at the morning report are answered by the LATCH service the same day, since they pertain directly to a case.

For more general, less urgent questions, the CML researches the topic and presents it at the next morning's rounds. Clevesy found that this combined service was useful not only to attending physicians but also to therapists, social workers, and family members, confirming that clinical library programs can provide hospital-wide service.[29]

Circuit-Rider Librarians

As it stands, the HCFA proposed regulations are still pending. If they are passed, and the requirement to maintain a hospital library is removed as a condition to participate in Medicare or Medicaid, some US hospitals may decide to eliminate their libraries in a misguided attempt to cut costs. However, another option is to use a circuit-rider librarian program.

A circuit-rider librarian is affiliated with a large resource library and provides library services for a fee to a number of small hospitals. Each week, the librarian makes rounds to participating hospitals to collect research requests. These requests are then researched at the sponsoring library.

E. Jean Antes, Robert Packer Hospital, Sayre, Pennsylvania, found that in addition to requests for clinical information, rural hospitals make a number of requests concerning administrative techniques, procedures, and requirements for hospitals.[30]

The St. Joseph's Hospital and Medical Center, Paterson, New Jersey, offers a circuit-rider package deal. For $5,000 a year, St. Joseph's provides a librarian to a neighboring hospital for six hours a week. In addition, the package includes 300 photocopies, unlimited loans of books and audiovisual materials from St. Joseph's collection, 50 computerized literature searches, and arrangements for interlibrary loan of materials not available at St. Joseph's.[31]

Evaluating Hospital Libraries

So far I have pointed out that hospital libraries can provide current information to users in a quick and cost-effective manner; they can provide a balanced perspective on medical issues; and they play a role in continuing education. In addition, a variety of services have been developed to improve information delivery. Emotionally, we as information providers feel that hospital libraries are useful but, unfortunately, this is not enough. The value of our activities must be demonstrated regularly by one means or another, including quantitative evaluations.

Margaret C. Hardy, Educational Resources Center, Dayton, Ohio; Josephine W. Yeoh, Riverside Methodist Hospital, Columbus, Ohio; and Susan Crawford, Washington University School of Medicine, note that this is a formidable task, since there are so many variables. The best alternative has been to rely on soft data from user-questionnaire feedback.[32] In a past essay, I have chastised the medical-library profession for not adequately providing hard data dealing with the economic impact of its services.[1] This parallels a similar challenge I made to the research community to document the economic impact of its achievements.[33]

I would like to discuss briefly the process of evaluating hospital libraries. F.W. Lancaster, professor of library science, University of Illinois, Urbana, distinguishes three levels of evaluation: effectiveness, cost-effectiveness, and cost-benefit analysis.[34] Effectiveness measures how well the library service satisfies the users. In the past, research has mainly been done by gathering opinions through a questionnaire or an interview. More objective studies, such as measurement of success in quantitative terms, are needed.

Putting a dollar value on information services to determine cost-effectiveness is difficult. In a related study, Donald W. King, King Research Inc., Rockville, Maryland, and colleagues tried to calculate the value of the US Department of Energy database.[35] Scientists were asked to estimate the dollar value of time and equipment saved by reading journal articles and technical reports. Results showed that the average savings per reading were $1,590 for a journal article and $1,280 for a technical report. These figures were based on estimates in research and development. Specific studies calculating the value of information services in medical care are needed.[35]

There are also classical studies, such as the 1964 survey by John Martyn, Aslib Research Department, London, UK, showing that there was as much as 20 percent unwitting duplication in published research.[36] No one to my knowledge has done an update.

Studies aimed toward justifying the expense of hospital libraries are just beginning to be done. One study by Paul B. Kantor, president, Tantalus, Inc., Cleveland, Ohio, obtained cost data from 32 academic libraries that revealed the unit costs of circulation, in-house reader use, and reference services.[37]

Hardy, Yeoh, and Crawford, mentioned earlier, described recent awards by the National Science Foundation to study the value and effectiveness of information delivery in decision-making, productivity, and performance.[32]

Richard De Gennaro, director of libraries, University of Pennsylvania, predicts that, in the future, "the excellence and usefulness of a library will be measured not only by the size and quantity of its collections but also by the range of resources that its staff is able to deliver to users by conventional and electronic means from a growing variety of sources. Users will no longer ask what the library has, but what it can provide."[38]

Conclusion

So the trend for justification has begun, and none too soon in my opinion. When the

hard data begin to accumulate, I have no doubt that the benefits of hospital libraries will greatly exceed their costs. Nevertheless, until the hospital library becomes fully recognized as a legitimate part of the medical facility, cost-conscious administrators will use outdated models of library service to cut library budgets. But without first-class information services, medical practice—especially in the hospital setting—will be impossible.

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