

Current Comments®

EUGENE GARFIELD

INSTITUTE FOR SCIENTIFIC INFORMATION®
3501 MARKET ST., PHILADELPHIA, PA 19104

Biomedical Decision-making: Will Hospital Libraries Keep Pace with the Information Age? Part 1

Number 25

June 23, 1986

Last July I was invited to discuss the hospital library's role in providing quality health care. My host was the Medical, Health and Welfare Libraries Group of the UK Library Association, which held its annual conference in Coventry. Subsequently, my talk was published in *Health Libraries Review*.¹ Although I have never worked in a hospital library, my invitation to speak was connected with an earlier essay regarding recent changes in regulations proposed by the Health Care Financing Administration (HCFA) of the US Department of Health and Human Services. The purpose of these new regulations is to remove the requirement that hospitals maintain a medical library in order to participate in the Medicare and Medicaid programs.² Today these changes in regulations are still pending, but they are expected to be passed by July of this year.

In my Coventry talk, I argued that the HCFA regulations are misguided. Today's library has widely expanded its services to include computer-based systems, which can make current, relevant information quickly available. As a result, the medical library can be an important tool in avoiding unwitting duplication of research, and it can help provide faster and more accurate diagnoses, thereby enhancing patient care. In addition, since the hospital library helps health professionals to keep current with the latest medical treatments, it can be used as a marketing asset. Administrators at rural hospitals can employ an advertising campaign telling the community residents that they can receive the

most up-to-date health care locally, without having to go all the way to a big city hospital. In this way, the hospital library can be a means to increase revenue.

My talk also discussed the hospital library's role in medical information science and technology, frequently called medical informatics. Indeed, in the short time since I spoke of the many benefits offered by the hospital library, a variety of new medical information programs have been developed to further improve information retrieval. For instance, *SciSearch*®, ISI's science and technology literature database, is now provided by the Swiss database vendor *Data-Star*. Formerly only available on DIALOG and DIMDI, this revised version of *SciSearch* includes many new features. The multidisciplinary database called *ISI/BIOMED*®, which provides direct access to the literature of research-front specialties, is now available to a wider international audience.

Many hospitals are developing or buying computer-based bibliographic information-retrieval systems designed to be used by computer novices to search for medical literature. As mentioned in the following reprint, the Washington University Medical Library, St. Louis, Missouri, was one of the first libraries to put the *Current Contents*® (CC®) machine-readable tapes online. This project has proved quite successful. Not only will it be continued, but its use will be extended further by other organizations that are now planning to implement a similar program to improve their information-retrieval capabilities.

While these new informatics technologies are cost-effective in providing a balanced perspective on medical issues, they are by no means designed exclusively for physicians and medical students. All health professionals can benefit from learning information-retrieval techniques. Indeed, one sign of a professional is the recognition that the literature is important. For instance, the nursing profession constitutes the largest single group of health-care workers in the world.³ To meet the needs of this profession, the *American Journal of Nursing's (AJN) International Nursing Index* is now sold together with ISI's *Nursing Citation Index™* to enable nursing educators, students, and practitioners to keep up with the expanding nursing literature. When looking up a paper or author in

the *Nursing Citation Index*, users will be directed to newer, related articles covered in *AJN's International Nursing Index*. Health service administrators will also benefit from our upcoming edition of *CC/Health Services Administration* covering the multidisciplinary literature ranging from clinical science to strategic management.

Despite the new hospital library programs and the many arguments outlined in the following reprint, the HCFA proposed regulations will most likely become law this summer. I can only hope that medical school and hospital administrators will recognize that the role medical libraries play in providing quality health care supersedes shortsighted government regulations.

© 1986 ISI

REFERENCES

1. Garfield E. The impact of health information delivery on the quality of patient care: whither medical information science? *Health Libraries Review* 2:159-69, 1985.
2. The impact of hospital libraries on the quality and cost of health care delivery. *Essays of an information scientist*. Philadelphia: ISI Press, 1984. Vol. 6. p. 47-52.
3. Journal citation studies. 44. Citation patterns in nursing journals, and their most-cited articles. *Essays of an information scientist: the awards of science and other essays*. Philadelphia: ISI Press, 1985. Vol. 7. p. 336-45.

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

by Eugene Garfield, Institute for Scientific Information®, Philadelphia, PA

*Paper given at the Medical, Health and Welfare Libraries Group Conference, UK, 5 July 1985.

In 1983 the Health Care Financing Administration (HCFA) of the US Department of Health and Human Services proposed new regulations that would eliminate the need for a hospital to maintain a medical library in order to qualify for participation in Medicare and Medicaid, US government-sponsored health insurance programs for the elderly and medically indigent. Just two and a half years ago in *Current Contents® (CC®)*, I speculated on the impact this kind of change might have on the quality and cost of health care.¹

Hospital libraries are of crucial importance, and I believe that a lack of support for them will have far-reaching consequences. Reduction in library support will hurt not only physicians but also patients and their families. In short, medical information is a requirement for cost-effective delivery of health care.

Health-care professionals need to keep up with current medical trends in order to make informed research, teaching, and clinical decisions. The key question is whether hospital libraries are necessary for this purpose. There are hundreds of physicians and researchers in the Third World who rely mainly on personal contacts, *CC*, a few subscriptions to medical journals, and reprint exchanges for keeping up-to-date.

However, to think of medical libraries simply as depots to facilitate keeping up-to-date is to make a mockery of libraries as the collective memory of organizations and societies. Indeed, if enacted as proposed, the shortsighted regulations considered by administrators in Washington would reduce many local US hospitals and physicians to the status of the underdeveloped in a developed society. Knowing the aspirations of Western-trained

physicians in the Third World, I am sure they would be perplexed to learn we are entertaining such notions. But poverty in the midst of plenty is not a new phenomenon in the US—or in the UK.

It is a hallmark of advanced societies and medicine that we value and have developed great national libraries and thousands of local libraries. The existence of the library is a symbol of respect for past and present knowledge. It is an implicit statement that we cannot carry in our heads all that is needed to practice modern medicine. If we wanted to rely on folk medicine, we could pass on knowledge by word of mouth from generation to generation. However, even the ancient Egyptians created medical papyri to jog the limited human memory.

We are all aware of how much the scientific literature is growing. Even with books and journals, professionals have a hard time keeping up with the growth and changes in medicine on their own. But the mere exponential growth of science and technology and the amount of research written, published, distributed, indexed, and abstracted do not by themselves justify the need for hospital libraries. The knowledge base on which biomedical advances have been built is accessible in many ways. The hospital library is not needed simply to increase the physician's exposure to more information in the decision-making process but to direct him or her to more specific information. It is precisely the need for more specific information that makes libraries, indexes, and especially librarians more relevant.

Clearly there is more to the modern medical library than a room with dusty books on a shelf. Today's library has not only widely expanded its services to include computer-based systems but has also added a variety of programs to make current, relevant information quickly available. Part of the problem health professionals and information specialists face is our unwillingness to deal with the semantic problem of calling an information-switching center a library.

In a study of the role of the health sciences library in information management, Nina W. Matheson, director, Johns Hopkins Welch Medical Library, and John A.D. Cooper, president, Association of American Medical Colleges, advise that computer-based systems are necessary to develop information management networks to protect state-of-the-art health care. They state, "As more fac-

ulty members concentrate more time and effort on the provision of health care, and less energy is devoted to expanding the knowledge base of medicine, the importance of a reliable and dependable flow of information from the research front to the health practitioner becomes greater."²

Matheson and Cooper make recommendations for hospital libraries that would help establish this information flow to enhance research, patient care, and education. These recommendations include establishing a computerized network between different kinds of libraries to facilitate the flow of data between various hospitals. A database management system should be developed so as to organize, package, and deliver information to augment clinical decision-making and learning. An individual should be designated to coordinate and implement institutional information programs. In addition, they recommend a program to teach medical practitioners, staff, and students computational skills and information management techniques.² This latter point concerning the inclusion of information skills in medical education is recommended by the Association of American Medical Colleges in the recently released General Professional Education of the Physician (GPEP) report.³

Computer-based systems require an initial outlay of money that, at first glance, might seem an unjustified expense to hospital budget committees, since they do not increase income. However, Ellen W. Green, director of libraries, Cedars-Sinai Medical Center, Los Angeles, California, in an article describing her experiences automating both managerial and operational functions within the Health Sciences Information Center, warned that the lack of computer technologies in the library is potentially dangerous—it may block qualified decision-making in the clinic and research areas.⁴

Cost is obviously a primary factor in operating a successful hospital library. Barbara Halbrook, Medical Library, Washington University, St. Louis, Missouri, has observed that "reports of discontinued programs indicate [that] lack of... budgetary support for the clinical librarian is the major reason for a program's demise."⁵ But others find that hospital libraries are quite successful and worth the cost. New and innovative ways to fund these programs have been initiated.

The expense may not be as high as many budget administrators might believe. In a

1981 study comparing the cost of clinical library services with traditional lab tests—such as blood tests and X rays—Georgia Scura, Medical Library, and Frank Davidoff, Department of Medicine, University of Connecticut School of Medicine, Farmington, found that library reference services cost between \$20.00 and \$32.00. This included \$8.00 to \$20.00 for a MEDLINE search, \$10.00 for one hour of the librarian's time, and \$2.00 for photocopying. This total was found to be less than the cost for a single chest X ray or one set of electrolyte studies.⁶

They also observe that a review of the literature, like a lab test, rarely leads to new diagnostic ideas. Both, however, may serve as a "stop-function."⁶ A stop-function may show that certain tests are not necessary, consequently lowering patient risk, discomfort, and overall medical costs.

In a 1983 article in the news magazine *US News & World Report* by Abigail Trafford and Clemens P. Work, William Guy, former director of California's Medi-Cal program (a health insurance program for the elderly in California), was quoted on the importance of this stop-function. "Today," Guy said, "a physician who walks in and orders every test known to man tends to be the hero of the hospital. Tomorrow he's going to be the bum."⁷ I think that this development has already occurred in the US.

The point is that any time an unnecessary test is avoided—or a more relevant one is applied—the patient, the hospital, the physician, and even the insurance companies benefit from lower costs. Considering all the risks in practicing medicine today, the hospital librarian can play an even greater role in selecting the best course of treatment.

Helpful for Second Opinions

Second opinions are applied less frequently than they ought to be, especially when a doctor is in a remote location. Current literature provides the physician with a variety of expert opinions. This is particularly crucial for rural hospitals with a small staff. Presumably, in larger city hospitals, one can talk to the doctor down the hall to obtain a second opinion. But this is done less frequently than you might believe.

Every physician maintains a personal file containing reprints, case notes, and other information, not the least of which is names and addresses of experts encountered in the past.

This auxiliary memory can lead to useful treatment ideas. Using this source for a second opinion is probably as important as accessing the current literature, browsing, or using literature searches.

In order to improve access to these second opinions, the Institute for Scientific Information (ISI[®]) has developed *Sci-Mate*[®], a microcomputer software package. While there are many other bibliographically oriented software products, we believe *Sci-Mate* is the only one that integrates the searching, filing, and publishing needs of the physician or scientist.

Microcomputer systems like *Sci-Mate* make it much easier for the clinician or clinical librarian to obtain second opinions by searching personal or local files consisting of any textual material, such as case summaries, abstracts, or titles. *Sci-Mate* also facilitates searching database bibliographic files like *SciSearch*[®] or MEDLINE.^{8,9}

Modern database management systems, designed to accommodate textual materials, allow users to keep tabs on reprints, correspondences, notes, or patient records, and employ menus for the occasional user who is not trained in command languages.^{8,9} There is also a native-language mode, should the system be shared by the physician and the medical librarian. In the future, it is likely that such shared systems will be commonplace. The physician will be at one terminal and the trained clinical librarian at another, so they can proceed as rapidly as possible, with the doctor providing feedback on which way to go.

With the increasing affordability of microcomputers, the development of new software programs for medical searching, and the availability of microcomputers in libraries, the majority of US physicians and researchers have access to microcomputer technology. Although I imagine that this situation will exist in Europe before long, we can expect only slowly increasing use of *Sci-Mate*-like systems, and it is unrealistic to think they will be adopted overnight. It may be easy to play computer games, but organizing information files is another matter. Medical librarians can make this transition to information management easier for the busy doctor. This accounts, in part, for new microcomputer centers at medical libraries, such as at the University of Pennsylvania and elsewhere.

Once that initial flush of excitement with a microcomputer is over, the physician then

has to face his usual routine. While the literature keeps getting published, not everyone enjoys sitting at a terminal. Library services have long included a selective dissemination of information (SDI) service to keep patrons current with the literature. This can be done through the MEDLINE SDI mode or through services like *Automatic Subject Citation Alert (ASCA®)* and *ASCATOPICS®*. These weekly or monthly services are delivered in the form of computer printouts. Another variant on this is the BITS service of BIOSIS, which is delivered on a microcomputer diskette and is compatible with *Sci-Mate*. Recently we remodeled the *ASCA* printout to take advantage of laser printers.¹⁰ An extension of the personalized SDI service is the more generic *ASCATOPICS*.¹¹ These selective reports are useful for a group that might be called an invisible college or a specialist group.

Consensus Conferences

A weekly *ASCATOPICS* report would be especially relevant prior to the organization of medical consensus conferences or journal clubs. These are common in the US but curiously lacking in the UK. SDI reports could help make participants aware of state-of-the-art treatments. When participants get together,

the medical library staff could be sure to put the most current literature at their fingertips. In the future, consensus conferences will also be aided by access to systems such as *ISI/BIOMED®*, accessible via DIMDI in Europe.

We have also developed a versatile system of mapping the quantitative and taxonomic relationships between scientific fields. By using multidimensional scaling, we are able to portray the world of science and medicine in terms of quantitative citations or connections.¹² These methods will not only help physicians find literature, but they will also become expert systems that will show physicians the world of medicine as it really exists at any moment in time.

Another way many physicians try to cope with the ever-increasing bank of medical information is by participating in continuing medical education courses. The cost of these courses includes not only the course fees and travel costs but also, for private practitioners, the income lost while attending. The cost of continuing education is included in overhead but eventually is a cost factor in medicine. Yet, according to David C. Evered and Hilary D. Williams, Ciba Foundation, London, continuing medical education has rarely been objectively evaluated to show that it meets medical graduate needs.¹³

(To be continued in Part 2)

REFERENCES

1. Garfield E. The impact of hospital libraries on the quality and cost of health care delivery. *Essays of an information scientist*. Philadelphia: ISI Press, 1984. Vol. 6, p. 47-52. (Reprinted from: *Current Contents* (8):3-6, 21 February 1983.)
2. Matheson N W & Cooper J A D. Academic information in the academic health sciences center. (Whole issue.) *J. Med. Educ.* 57(10), 1982. 93 p.
3. Association of American Medical Colleges. *Physicians for the twenty-first century. The GPEP report. Report of the Panel on the General Professional Education of the Physician and College Preparation for Medicine*. Washington, DC: AAMC, 1984. 48 p.
4. Green E W. Implications for hospital libraries. *Bull. Med. Libr. Assn.* 71:415-6, 1983.
5. Halbrook B. Clinical librarian programs: reflections on successes and failures. *Clin. Libr. Quart.* 2(1):9-12, 1983.
6. Scura G & Davidoff F. Case-related use of the medical literature. *JAMA—J. Am. Med. Assn.* 245:50-2, 1981.
7. Trafford A & Work C P. Soaring hospital costs. The brewing revolt. *US News World Rep.* 95(8):39-42, 1983.
8. Garfield E. Introducing *Sci-Mate*—a menu-driven microcomputer software package for online and offline information retrieval. Parts 1&2. *Essays of an information scientist*. Philadelphia: ISI Press, 1984. Vol. 6, p. 80-7; 96-106.
9., *Sci-Mate 1.1: Improved customer services and a new version of the software for personal text retrieval and online searching. Ibid.*, 1985. Vol. 7, p. 50-6.
10., You don't need an online computer to run SDI profiles offline! So why haven't you asked for *ASCA*—the ISI selective citation alert. *Ibid.*, 1984. Vol. 6, p. 88-95.
11., Information à la carte: *Custom Contents* and the new *ASCA* cater to your current-awareness needs. *Current Contents* (40):3-9, 7 October 1985. (Reprinted in: *Essays of an information scientist: ghostwriting and other essays*. Philadelphia: ISI Press, 1986. Vol. 8, p. 379-85.)
12., ABCs of cluster mapping. Parts 1&2. *Ibid.*, 1981. Vol. 4, p. 634-49.
13. Evered D C & Williams H D. Postgraduate education and the doctor. *Brit. Med. J.* 280:626-8, 1980.