The Informationist: A New Health Profession?

Physicians have always had a professional obligation to base their decisions on the best available information, an assumption now explicitly embodied in the concept of evidence-based medicine (1). For decades, when physicians wanted information from the published literature, they relied heavily on medical librarians or office assistants to do the searches. The advent of computer-based indexes such as MEDLINE promised to change all that by putting the basic information retrieval tools directly into physicians' hands. The disappointing reality, however, is that physicians still don't regularly search the medical literature themselves, nor do they ask for professional help in searching nearly as often as they need to. Many questions arising in clinical encounters that can, and should, be answered on the basis of evidence from the published literature are therefore never addressed (2, 3).

Explanations for this sad state of affairs aren't hard to find. First, the published evidence that clinicians need is scattered among thousands of journals, textbooks, monographs, reports, guidelines, and the like, many of which are not electronically indexed. Second, electronic indexing of articles is far from ideal (4, 5), and the techniques of electronic searching are still complex and arcane. As a result, electronic searches all too often yield no "hits" at all or avalanches of irrelevant citations (6). Third, most physicians now in practice did not acquire the skills of literature retrieval during their training. And although 80% of medical students report that their literature searching skills are adequate by the time they graduate (7), those skills rapidly decay unless clinicians use them regularly, which few manage to do. Finally, even using current electronic systems, finding and selecting literature-based data to solve a single patient-related problem can easily require an hour or more (8). Physicians don't, and never will, have that kind of time to look for the answers to most of their clinical questions themselves.

Complicating the demands of literature retrieval is the need to judge the quality of the retrieved literature and extract the essential information from it, using techniques of critical appraisal. These techniques are not easy to teach and are time-consuming to apply. Moreover, once useful information has been dug out of the literature, the task of linking it to the case at hand remains. It is no wonder, then, that physicians prefer to get answers to many clinical questions from expert colleagues. That's fine as far as it goes, particularly when the experts are well grounded in the published evidence. But expert medical opinion is far from infallible, and it isn't always easily available.

In sum, the medical profession falls far short in its efforts to make the critical link between the huge body of information hidden away in the medical literature and the information needed at the point of care. This failure means not only that many opportunities for improved patient care and continued learning are missed but also that much of the effort, creativity, and money that go into biomedical research is simply wasted.

True, a few investigators have tried to develop ways to bridge the literature–practice gap (9, 10), but those innovations have remained largely outside the mainstream of clinical practice. Interest in linking literature directly to practice was also what motivated a medical librarian, Gertrude Lamb, some 30 years ago when she decided to move medical reference librarians out of the stacks and onto clinical services, thereby creating the program known as clinical librarianship (11). The librarians in these early programs were quick to discover that their presence on bedside rounds and in conferences made it easy for clinicians to bring up questions that would otherwise have remained unasked. Often the librarians helped clinicians formulate their questions more clearly. Once the need for information was identified, the librarians would retrieve the best information they could find, usually within a day, sometimes within hours. And over time, they even began to infer questions from the discussion and bring literature forward on their own.

Several studies subsequently showed that clinical librarianship programs are, in fact, both efficient and effective (12–17). They add to clinicians' knowledge most of the time, affect clinical decisions a substantial proportion of the time, and even improve certain outcomes, such as length of stay—which is more than can be said for many widely used clinical interventions. More recently, clinical librarians in at least some programs have begun to "project themselves not as information 'servers' who trail the team in an auxiliary capacity, but as an integral part of the group with a specialized expertise that can contribute vitally to clinical situations" (16). These new-style librarians read the full text of

the most pertinent articles, identify and extract the relevant information, write brief synopses of their findings, and present them on rounds and at conferences. But with a few notable exceptions, mostly in large academic centers, clinical librarianship has failed to take root and flourish.

Why should a program with such obvious promise remain so marginal? Part of the problem, as usual, is lack of money. Although the current U.S. medical care nonsystem happily continues to pay billions of dollars for the information generated by millions of unnecessary or inappropriate clinical tests (18), it unfortunately refuses to pay a dime specifically to move the rich, sophisticated knowledge from the medical literature to the bedside, where it not only might improve care but might actually save money. The resulting chronic, and increasing, budgetary constraint on medical libraries means that vital on-site library staff can't be replaced if they are shifted onto clinical services. Even worse, these perverse priorities have resulted in the complete elimination of many hospitals' medical libraries in an effort to "cut costs."

Another part of the problem may be physicians' ambivalence about needing help in finding clinical information. After all, possession of highly specialized, complex knowledge lies at the heart of physicians' identity, a principal source of their power and prestige. But even as physicians seriously underuse that knowledge, they seem to feel the need to control it completely, a posture reminiscent of their reluctance to share blood pressure measurement with nurses when that technique was first introduced (19).

We believe it's time to face up to the fact that physicians can't, and shouldn't, try to do all or even most medical information retrieval themselves. In the current environment, that makes no more sense than it would for physicians to perform all or most of their own clinical chemistries, electrocardiography, computed tomography, and the like. Better they should focus their scarce discretionary professional time on reading, discussing, and reflecting in ways that truly deepen their conceptual and practical understanding of medicine than on the mechanics of finding, extracting, and synthesizing information from the published literature.

But if practicing clinicians don't retrieve information from the literature themselves, who will? Professional groups and commercial publishers are already producing synoptic compendia, such as *ACP Journal Club*, the Cochrane Library, and *Clinical Evidence* (20), secondary publications of clinical evidence extracted from the primary published literature that are available in both print and electronic form. And hundreds of medical Web sites offer a dizzying array of clinical content to both physicians and patients. Some of these new sources may, in fact, be helpful in clinical problem solving, but few are really designed to provide information at the point of care, and their very numbers, not to mention their uneven quality and the difficulty of keeping them current, may compound the problem of information retrieval more than they help to solve it.

The other obvious answer, therefore, is to establish a national program, modeled on the experience of clinical librarianship, to train, credential, and pay for the services of information specialists. These new professionals might be called informationists (not a graceful term, but one that parallels such terms as gastroenterologists or hospitalists), or clinical knowledge workers (in parallel with social workers). We see no reason why they shouldn't ultimately become a part of almost every clinical staff and service, as ubiquitous as head nurses or office managers. Their services should be available to all members of the health care team—physicians, nurses, technicians, administrators—as well as to patients and their families. The operating details of such a program will need to be worked out along the way, but in our view, four general principles must guide its development.

First, informationists must have a clear and solid understanding of both information science and the essentials of clinical work. Two paths to this professional role will therefore be necessary, one for those who begin their training as information specialists, the other for those who start with a clinical background. No matter which path they take, all who become informationists will need to master a standard curriculum. Developed with input from clinicians, medical librarians, medical informaticians, educators, and clinical epidemiologists, this multidisciplinary learning experience should include a core of basic medical concepts, principles of clinical epidemiology, biostatistics, critical appraisal, and information management. Second, in addition to acquiring the requisite conceptual knowledge, informationists must learn the practical, working skills of retrieving, synthesizing, and presenting medical information and the skills of functioning in a clinical care team. This can be accomplished only through a supervised practicum, as is now required in some clinical librarian programs (15, 16). Third, training programs for informationists should be accredited, and graduates of those programs certified, through national agencies, as is now the case for working professionals in almost all clinical disciplines. Finally, even well-trained and highly skilled informationists cannot contribute meaningfully to the care of patients unless clinicians, care teams, and the entire health care system recognize their importance, understand their role, and actively include them in the process of care. To that end, informationists should, in most settings, answer directly to clinical directors and

chiefs of staff, and their services should be paid for directly, as is done for other health care providers.

Less obvious but no less important is the opportunity an informationist program will create for obtaining information about information: that is, complete, systematic feedback on what kinds of clinical questions are asked most often, and which questions lack satisfactory answers. Such "meta-information" could contribute importantly to the definition of clinical research agendas, both locally and nationally. Informationists can also play a crucial role in improving existing information retrieval systems and creating new ones by finding out more about when and how clinicians, patients, and families need information, what information they need most, and in what forms it is most useful to them.

Despite its obvious attractions, creation of an informationist program will not be easy. For one thing, potential turf issues in relation to library science, medical informatics, and clinical medicine will need to be resolved. In our view, an informationist program is more likely to happen if it begins on a limited basis, through national demonstration projects or pilots. These pilot programs must include a carefully designed evaluation component that can show us whether participation of informationists in clinical care, in both hospital and office practice, actually improves the quality of care, as well as making it more efficient and cost-effective. If meaningful benefit can't be clearly documented, the program should be given a decent burial. If it can, however, as we obviously believe it will, that documentation will be crucial in establishing appropriate, full payment for informationists' services.

We believe it is unacceptable in this "information age" for medical information retrieval to remain in its current neglected and disorderly state, a poor relation in the family of biomedical research and clinical practice. The concept of the informationist is an idea whose time has come. We challenge everyone involved in health care to transform that concept into reality.

Frank Davidoff, MD
Editor

Valerie Florance, PhD
Association of American Medical Colleges
Washington, DC 20037

References

1. **Davidoff F.** In the teeth of the evidence: the curious case of evidence-based medicine. Mt Sinai J Med. 1999;66:75-83.
2. **Smith R.** What clinical information do physicians need? BMJ. 1996;313: 1062-8.
3. **Ely JW, Osheroff JA, Ebell MH, Bergus GR, Levy BT, Chambliss ML, Evans ER.** Analysis of questions asked by family physicians regarding patient care. BMJ. 1999;319:358-61.
4. **Funk ME, Reid CA.** Indexing consistency in MEDLINE. Bull Med Libr Assoc. 1983;71:176-83.
5. **Purcell GP, Rennels GD, Shortliffe EH.** Development and evaluation of a context-based document representation for searching the medical literature. International Journal on Digital Libraries. 1997;1:288-96.
6. **McKibbon KA, Haynes RB, Dilks CJ, Ramsden MF, Ryan NC, Baker L, Flemming T, et al.** How good are clinical MEDLINE searches? A comparative study of clinical end-user and librarian searches. Comput Biomed Research 1990;23:583-93.
7. Medical School Graduation Questionnaire. All Schools Report. Question 20. Association of American Medical Colleges, 1999. http://www.aamc.org/meded /gq. Accessed 6 March 2000.
8. **Florance V.** Clinical extracts of biomedical literature for patient-centered problem solving. Bull Med Libr Assoc. 1996;84:375-85.
9. **Sackett DL, Straus SE.** Finding and applying evidence during clinical rounds: the "evidence cart." JAMA. 1998;280:1336-8.
10. **Cimino JJ, Elhanan G, Zeng Q.** Supporting infobuttons with terminological knowledge. Proc AMIA Annu Fall Symp. 1997:528-32.
11. **Lamb G.** A decade of clinical librarianship. Clinical Librarian Quarterly. 1982; 1:2-4.
12. **Scura G, Davidoff F.** Case-related use of the medical literature. Clinical librarian services for improving patient care. JAMA. 1981;245:50-2.
13. **Marshall JG.** The impact of the hospital library on clinical decision making: the Rochester study. Bull Med Libr Assoc. 1992;80:169-78.
14. **Veenstra RJ.** Clinical medical librarian impact on patient care: a one-year analysis. Bull Med Libr Assoc. 1992;80:19-22.
15. **Giuse NB, Kafantaris SR, Miller MD, Wilder KS, Martin SL, Sathe NA, et al.** Clinical medical librarianship: the Vanderbilt experience. Bull Med Libr Assoc. 1998;86:412-6.
16. **Giuse NB.** Advancing the practice of clinical medical librarianship. Bull Med Libr Assoc. 1997;85:437-8.
17. **Dodson S.** A clinical medical librarian program into the next millennium. http://healthlinks.washington.edu/hsl/liaisons/dodson. Accessed 2 March 2000.
18. **van Walraven C, Naylor CD.** Do we know what inappropriate laboratory utilization is? A systematic review of laboratory clinical audits. JAMA. 1998; 280:550-8.
19. **Crenner CW.** Introduction of the blood pressure cuff into U.S. medical practice: technology and skilled practice. Ann Intern Med. 1998;128:488-93.
20. Clinical Evidence: A Compendium of the Best Available Evidence for Effective Health Care. London: BMJ; Issue 2, December 1999.