
Physician information seeking: improving relevance through research*

By Larry D. Gruppen, Ph.D.

*Postgraduate Medicine/Health Professions Education
G-1200 Towsley Center
University of Michigan Medical School
Ann Arbor, Michigan 48109-0201*

Health sciences libraries have considerable potential as resources for both formal continuing professional education, as well as the informal continuing education that results from the professional's efforts to solve problems in daily practice. While there is a growing interest in making the resources of health sciences libraries more accessible to practitioners on a routine, day-to-day basis, there also needs to be more awareness of how, when, where, and why professionals look for information in the context of practical problems. This paper reviews recent research that identifies the context in which physicians seek information and advice from external sources, the information sources that physicians access, and the factors that influence which particular sources are sought. The results indicate that physicians vary in their information needs, preferences, motivations, and strategies for seeking information. This diversity suggests that health sciences libraries, in their efforts to be more accessible, should consider "market research" to determine the needs, preferences, and use patterns of the library's targeted users. Libraries may also benefit from exploring alternative methods of improving access to their resources.

While continuing education (CE) for health professionals has a number of purposes, a central one is the effort to keep practitioners up-to-date on the exploding growth in knowledge about disease processes, diagnoses, and treatments. CE is typically viewed in terms of formal programs centered around particular topics and targeted at particular audiences. The prototypic CE course, in which a series of experts lecture an audience of practitioners, is still very much the norm, although new and innovative formats are common. There remains, however, some question about the effectiveness of the prototypic CE course. Formal CE is often criticized by participants as being too academic and irrelevant to the daily practices of many practitioners. In addition, there is limited evidence that changes are made in the professional's practice as a result of attendance at such CE courses [1].

Considerable CE also takes place on an informal basis as practitioners attempt to solve problems in daily practice and seek information and assistance

from various sources when their knowledge bases prove inadequate. Recent research in cognitive psychology and cognitive anthropology has emphasized the importance of practical as opposed to abstract knowledge in relation to skilled performance [2-3]. Of special relevance to the present discussion is the finding that skill depends not on the possession of abstract knowledge about a domain, but on the possession of quite specific procedures for behaving in particular problem situations. Often, this "applied knowledge" is largely unconscious and has been acquired not through formal education, but through extensive experience with practical problems and tasks in the profession. Another significant finding is that skilled cognition and performance is extensively "situated," that is, how an individual understands a problem and then responds to it depends greatly on the situation or context in which it occurs.

Schön provided a rich description of how this practical knowledge is acquired and applied in the context of problems confronted in everyday practice [4]. In a case study of training and practice in psychotherapy, he described how a psychiatry resident learns the practical knowledge needed for effective therapy. The

* This research was supported in part by NIH Grants R18 HL 30566 from the National Heart, Lung, and Blood Institute and RO1 LM 04485 from the National Library of Medicine.

resident learns not through didactic classroom experiences, but through interaction with a patient, guided by the supervising therapist who leads the resident in reflecting on what the resident knows and how the resident interprets and understands the patient and the patient's problem and description of events. The education that takes place is situated in a problem with a rich context of background knowledge and history, and focuses on knowledge and skills that are directly applicable to the problem at hand. Relevance and practicality are central.

CE is typically viewed in terms of formal programs centered around particular topics and targeted at particular audiences. The prototypic CE course, in which a series of experts lecture an audience of practitioners, is still very much the norm, although new and innovative formats are common.

From these findings, a case can be made that informal CE may have greater potential than formal CE for changing physician practice because it is more problem-oriented, and therefore more practical and applied. The importance of such learning in practice is echoed by Cervero, who claimed that a model of learning from practice should be the centerpiece of any system of CE for a professional [5].

Given indications of the importance of knowledge gained in practice, this paper will focus on informal CE, the learning that takes place in the context of practitioners confronting and attempting to resolve problems in day-to-day practice. Health sciences libraries have considerable potential for an important role in both formal and informal CE, but much of this potential, particularly regarding informal CE, has not yet been realized. Perhaps the major opportunity for health sciences libraries to participate in informal CE is in the information-seeking component. Such information is sought for a specific purpose and may be incorporated into the physicians' practice behaviors much more rapidly than the information fed to them in an abstract form outside of the practical application of medicine. By exploring some characteristics of informal CE, particularly the dynamics of information and advice seeking, the niche that health sciences libraries can fill in this form of learning can be better defined.

Physicians certainly constitute one of the larger target clienteles of health sciences libraries, but it is also important to be able to generalize the principles characterizing physician information seeking to other health professions.

This examination of information seeking in informal CE centers around two basic questions:

■ *What is the context in which physicians seek additional information?* This is essentially a question of motivation or purpose. The reasons for seeking information may be quite specific or quite general. The purpose of the information seeking, along with the specific problem, will determine the kind of information the physician is likely to need.

■ *What sources of information will physicians access and find more or less useful?* Integral to this question is the issue of factors that influence information seeking.

Health sciences libraries have considerable potential for an important role in both formal and informal CE, but much of this potential, particularly regarding informal CE, has not yet been realized.

THE CONTEXT OF INFORMATION SEEKING

Studies of the reasons why physicians attend formal CE courses have identified a number of motivational dimensions; these include maintaining and improving professional competence and service to patients, understanding one's professional role, interacting with colleagues, enhancing personal and professional position, gaining a respite from practice, and concern about legal issues [6-7]. These reasons are fairly general and abstract and thus may fit well with the nature of the information provided in formal CE formats.

Considerably less attention has been given, however, to the context in which physicians seek supplemental information in practical, day-to-day problems. In a study using a critical incident technique, Moore-West found that the reasons given in these more specific problem situations were also fairly diverse [8]. Solving patient care problems was, by far, the most common reason, but others included general care information, patient education, curiosity, and research purposes. Within this overall ranking of importance, it was found that (in comparison with physicians in government, university, or urban settings) physicians in rural settings more often sought help for patient care questions and less often asked questions out of curiosity or for research purposes.

Perhaps not surprisingly, there is also evidence that physicians are more likely to seek informational assistance when the problem is unfamiliar rather than for those they have experienced previously [9]. In this study, it was striking that general experience (such as number of years in practice and patient load) did not influence the physician's perceived need for supplemental information. In order to be beneficial, experience had to be related closely to the specific problem under consideration. This finding is consistent

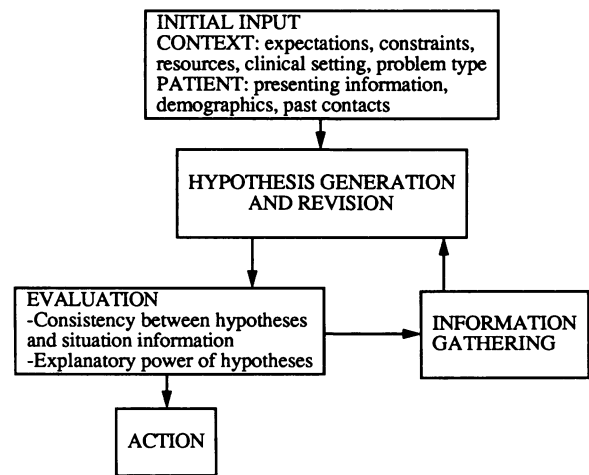
with the situated or context-dependent nature of skilled cognition as emphasized in studies in cognitive psychology. As in Schön's example of the psychiatry resident, the knowledge gained was related closely to the problem in which it was encountered; this may help explain why general experience might have so little relevance when performance in particular problems is studied.

There is evidence that physicians are more likely to seek informational assistance when the problem is unfamiliar rather than for those they have experienced previously.

Although little empirical research exists regarding the context of information seeking in practical settings, this issue can also be examined from a more conceptual level (Figure 1). Research on physicians' clinical reasoning processes, usually in the context of diagnosis, indicates that physicians are adept at generating initial, tentative explanations (or hypotheses) for a given case [10–12]. They do this with sparse initial information about the patient and without the aid of any external assistance. These initial hypotheses are evaluated on the basis of how well they "fit" the situation, that is, how well they account for what is known and unknown. This evaluation guides the gathering of subsequent information from the patient through the history, physical examination, and laboratory investigations, as well as through references to external information sources, such as colleagues and medical literature. The information obtained feeds back into the set of hypotheses, leading to possible revisions, the generation of new alternatives, and the elimination of old ones. Ultimately, a hypothesis is accepted when a criterion level accounting for the patient's problem is reached. Actions are then selected on the basis of this accepted hypothesis.

The hypothesis generation/revision—evaluation—information-gathering cycle may occur repeatedly. In this cycle, the physician may, at some point, need to seek supplemental information from some source especially if it becomes difficult to make decisions about either what data to look for (e.g., what test would be most informative given this problem) or what implications the data might have for the hypotheses considered. This model implies that most questions asked of external information sources will center around interpreting or evaluating findings, identifying a better diagnostic test for evaluating hypotheses, or identifying alternative responses (treatments and management protocols) relevant to a given diagnosis rather than specifying possible diagnoses.

Figure 1
A model of the clinical reasoning process



The research of Lockyer is relevant to the issue of the context in which physicians seek information [13]. The research examined the changes made by physicians in their practices and the sources of information implicated in these changes. Most of the changes were in drug-prescribing practices, with other substantial categories being technical procedures, or new radiologic and laboratory services (investigations). These changes were also more often refinements of management practices rather than radical changes in patient care. The researchers observed that the process of physician change in practice or treatment procedures frequently involved multiple sources of information (three on the average) and a respectable length of time (somewhat less than one year). The initial introduction to an innovation or possible change often occurred through medical journals, continuing medical education (CME) courses, and discussions with colleagues, but the final decision to implement was based on the physician's perception of the new procedure's benefit.

INFORMATION SEEKING: SOURCES AND INFLUENCES

Numerous possible sources of medical information have been identified that are potentially relevant to helping physicians resolve practical problems. These include CME courses, mass media, patients, audiovisual programs, journals, textbooks, pharmaceutical representatives, colleagues, specialists, and computerized databases, among others. The preferences physicians have for these sources and how they access them can be conceptualized in terms of information-

seeking strategies in which they first access the most preferred source, followed by secondary sources if the problem remains unresolved.

Several studies have produced rank orderings of physicians' preferences for various information sources. The orders vary somewhat depending on the sources included in the study and the nature of the study's focus. One ordering ranked professional meetings as most preferred, followed by formal courses, colleagues, books, journals, videocassettes, audio-cassettes, chart audits, and finally, drug company representatives [14]. Another found that formal postgraduate lectures, direct discussion with consultants, and medical journals were more favored than tape or slide presentations, films, and informal lectures [15]. An ordering of information-source preferences specifically related to cancer problems consisted of medical literature, professional colleagues, association meetings, CME courses, pharmaceutical representatives, patients, and the American Cancer Society [16]. Yet another study found a fairly basic pattern of preferences for information sources starting with textbooks or journals, and followed by informal consultations with colleagues, with community specialists, and with specialists outside the community [17]. In this study, variants in information-seeking strategies as a function of the individual or physician specialty appeared to stem from entering this sequence at different points or skipping one or another of the sources in the sequence, yet maintaining the basic overall pattern of relative preferences for information sources.

A number of factors influence just which information sources physicians use (or say they would use) in particular situations. Some that have been identified in prior research include physician characteristics, such as age, experience, and speciality; practice characteristics, including community size, practice type, and setting; and the availability of specialists, colleagues, and educationally influential physicians or opinion leaders.

Physician characteristics

The age of the physician is one characteristic that influences preferences for information sources. Younger physicians appear to make greater use of medical literature and of colleagues than did their older counterparts. In contrast, older physicians more often used pharmaceutical representatives and preferred CME courses [18–19]. These differences may not be attributable simply to differences in level of experience. Gruppen and colleagues found that the level of experience, either in general or with a particular problem, did not influence the physicians' preferences for different information sources [20]. More likely, differences between older and younger

physicians were due to differences in their training, as well as to differential access to and familiarity with using various information sources. Such differences in familiarity are probably most apparent in relation to computerized resources; today's medical students are encountering increasingly routine use of computers in their training, a technology that was largely irrelevant for physicians even ten years ago.

The age of the physician is one characteristic that influences preferences for information sources. Younger physicians appear to make greater use of medical literature and of colleagues than did their older counterparts. In contrast, older physicians more often used pharmaceutical representatives and preferred CME courses.

The physician's certification status has an impact on the timing of advice or information seeking; those who are certified by a professional board are more willing to treat challenging problems without seeking additional information than are those who are not certified [21].

Practice characteristics

In addition to the influences of the characteristics of the individual physician, the nature of the physician's practice also affects information seeking. The physician's specialty is one such characteristic. Lockyer and colleagues found that specialists used journals and discussions with colleagues more often in deciding to change their drug-prescribing practices in comparison with family practitioners, who more often used consultations and pharmaceutical representatives [22]. More generally, family practitioners often consulted with colleagues about treatment and management, while primary care internists more commonly used medical literature [23].

The influence of practice type also has received some attention. Physicians in institutional practices (medical schools and full-time hospital staff) used colleagues more often than did those in solo or group practices [24], and those in group practices more often cited informal discussions with colleagues than did their colleagues in solo practice [25]. This is not particularly surprising given that colleagues are simply more available in institutional and group practices.

The greater availability of colleagues and specialists probably also underlies the finding that physicians in larger communities made greater use of community specialists and colleagues than did those in smaller communities who more often indicated a preference for outside specialists [26–27]. In addition

to colleagues and specialists, journals and libraries were also more popular sources of information for physicians in more populous areas [28], as well as in group practices [29].

Physicians in institutional practices (medical schools and full-time hospital staff) used colleagues more often than did those in solo or group practices, and those in group practices more often cited informal discussions with colleagues than did their colleagues in solo practice.

Specialists and colleagues

A prominent finding in these studies was the importance of other physicians in information and advice seeking. A number of studies have focused on the characteristics of the physicians that other physicians seek out for advice and information. Often identified as "opinion leaders" or "educationally influential" physicians, they were early adopters of new techniques, stayed up-to-date on advances within their fields, and disseminated innovations in medical diagnosis and treatment to their colleagues [30-34]. The value of such physicians as information sources stems from their wide availability, and willingness to teach and provide free informal consultations in ways that are tailored to particular problems.

The importance of these clinicians has been identified in studies of referral and consultation networks that examine whom primary care physicians talk to about particular problems and questions. These educationally influential physicians (EIs) may be specialists, often practicing in university or hospital-based settings [35]. They tend to consult among themselves and with specialists outside of the geographic area [36]. The importance of EIs as information sources varied with the domain and complexity of the particular problem, but the continued growth and specialization of medical knowledge suggests that their importance will only increase [37-38].

CONCLUSIONS AND IMPLICATIONS

These studies present a picture of physicians seeking advice and additional information in the context of solving day-to-day problems by accessing a variety of information sources. The preferences physicians have for these sources varied with characteristics of the individual physician, such as age and certification status, and with characteristics of the physician's practice, such as specialty, setting, and community

size. The role of other physicians as sources of information appeared to be a major factor in this domain.

What role do health sciences libraries play in this form of informal CE? The research collected in this review does not provide a clear picture. Books and journals are indeed frequently cited, but these studies indicate quite consistently that the source of these text materials is primarily the physician's personal rather than an institutional library [39-40]. This is true even though a substantial majority of physicians have access to an institutional library [41]. Often, however, libraries are not included in the questionnaire's list of available information sources, which makes a conclusive statement difficult.

The importance of EIs as information sources varied with the domain and complexity of the particular problem, but the continued growth and specialization of medical knowledge suggests that their importance will only increase.

There are certainly clear opportunities for health sciences libraries to contribute to informal CE. As repositories for information on diagnostic findings, new drugs, laboratory tests, treatment options, and management protocols, there is much that libraries can offer the physician looking for help in resolving a challenging problem. Based on the description of physician actions related to such problems, the greatest opportunity for health sciences libraries may lie in treatment and management decisions rather than diagnosis. Treatment and management usually take place over a period of time, with frequent opportunities for the physician to make modifications on the basis of feedback, either from the patient's response or external sources of information. Because treatment and management protocols change frequently as new drugs are introduced and regimens developed and refined, the clinician who values up-to-date information may find great value in the resources of health sciences libraries.

Still, barriers remain to the physician's use of and perception of the value of libraries. The major suggestions physicians made a decade ago for improving medical libraries, by increasing the scope, relevance, currency, and availability of materials [42], seem to have been met by the development of computerized access to massive literature and information databases. Yet the findings described earlier suggest that many primary care physicians may not capitalize on this expanded access. Why not? A theme embedded in this literature is an emphasis on the part of the primary care physicians on relevance and ease of access in information sources. They sought out other phy-

sicians because they provided timely advice that was targeted to the particular problem they were confronting without having to search out and synthesize a mass of information for themselves. When they did investigate the literature, they retrieved it from their own files and library because it was readily accessible, it was familiar, and they knew where to look for information they had (probably) seen there before.

The major suggestions physicians made a decade ago for improving medical libraries, by increasing the scope, relevance, currency, and availability of materials, seem to have been met by the development of computerized access to massive literature and information databases. Yet the findings described suggest that many primary care physicians may not capitalize on this expanded access.

In contrast to these easy-to-use, readily accessible, familiar, and often focused information sources, institutional libraries and the computerized databases constituted something of an unfamiliar and potentially threatening environment that required mastery of new skills and technology. Even with the investment of this effort, the physician was rewarded with access to a mass of information that was seldom organized, synthesized, and summarized in the ways that colleagues and specialists provide. Not only was the apparent cost of using these resources high, but the benefits may not have been particularly apparent to these clinicians.

Note, however, that this possible reason for not using the resources of health sciences libraries was centered on the primary care practitioner. The picture for the opinion leader or EI physician may be quite different. These clinicians may find a greater payoff in mastering the skills needed for access to up-to-date information and may be willing to spend the time searching out and synthesizing literature findings.

What implications for health sciences libraries can then be extracted from this literature summary?

■ **Informational needs assessment.** Because studies indicated that physicians are very diversified in the information they seek, the sources they access, and the use they make of the information, it is difficult to maintain support for the idea of a single mode of formal CE as applicable to all physicians in all situations. While numerous alternative modalities of CE are available (informal CE being one of them), more attention needs to be given to tailoring the needs of the target physician population and the available CE

resources. Physicians are not uniform in their information needs or strategies and preferences for seeking information; this indicates the importance of health sciences library "market research" to determine the needs, preferences, and use patterns of the individual library's targeted clientele. In what content areas do physicians perceive a need for information support? What information do they need frequently (diagnostic, drug information, treatment and management protocols, etc.)? What relative value do they place on comprehensiveness of the information versus specific relevance to the problem?

It would appear that reference librarians may be in an excellent position to gather data on the users of libraries and online databases as they process requests for information. The literature suggests some items that might be fruitfully gathered, but attention should also be given to the reasons physicians use library resources and the intended applications of the information they receive.

■ **Augmenting accessibility.** Regardless of the clientele, continued efforts need to be made to improve the accessibility of the libraries' information. Past improvements have focused on providing very flexible access to the largest available databases, with the implicit assumption that more information is naturally better. The findings above and research in cognitive psychology indicate that this is a problematic assumption. When physicians are interested in specific answers to very circumscribed problems, searching through a database designed for generality and flexibility carries with it very high costs in managing a great deal of information that is irrelevant to the problem at hand. While such databases are well suited for exploring problems and following links to other domains, it suffers from the requirement that the user know how to ask the right questions. Frequently, the user is not even sure of what the problem is, much less how to ask appropriate questions.

Two responses to this might be explored. One is to develop more focused databases related to specific, recurrent problem areas (e.g., rheumatological disease) that summarize information from various sources into general conclusions and actions. This is essentially the niche for which artificial intelligence and expert systems are designed, but less technology-intensive solutions may remain useful. Another response would be to develop a "human interface"—staff that can act as consultants, adapting and translating physician requests into forms amenable to use in the database.

■ **Targeting the opinion leaders.** The research provides repeated evidence for the importance of EI opinion leaders as a major avenue of disseminating information. Use of health sciences libraries, through computerized access or otherwise, may well be considered an innovation that might be disseminated in

ways similar to medical innovations. Efforts by health sciences librarians to identify clinicians who might act as opinion leaders in this context would be a worthwhile endeavor. Some uncertainty remains, however, about whether community practitioners will seek advice regarding this particular innovation, *per se*. Typically, community physicians seek advice and information regarding a specific problem for a specific purpose. It is not clear what relevance they might see in the technology of accessing broad, multipurpose databases. It may be that in disseminating problem-specific information, the EI can also convey the value and usefulness of health sciences library resources. Librarians should seek to encourage and support this kind of incidental dissemination of library innovations by not only identifying the EI physicians, but also fostering close relationships with them in an effort to better adapt the library's resources to the physician's needs.

Health sciences libraries, then, have great potential for participating in a key aspect of the CE of physicians, and by extension, other health professionals. This potential is not monolithic, however; there is great diversity and richness in the particular ways libraries can assist practitioners in accessing and applying information to practical problems. The variety of these opportunities provides a considerable domain for study and small-scale experimentation that seeks to match the resources of the library with the needs of the user.

REFERENCES

- HAYNES RB, DAVIS DA, MCKIBBON A, TUGWELL P. A critical appraisal of the efficacy of continuing medical education. *JAMA* 1984 Jan 6;251(1):61-4.
- ROGOFF B, LAVE J. *Everyday cognition: its development in social context*. Cambridge, MA: Harvard University Press, 1984.
- STERNBERG RJ, WAGNER RK. *Practical intelligence: nature and origins of competence in the everyday world*. Cambridge, MA: Cambridge University Press, 1986.
- SCHÖN D. *The reflective practitioner: how practitioners think in action*. New York: Basic Books, 1983.
- CERVERO RM. Professional practice, learning, and continuing education: an integrated perspective. Invited address presented at the Annual Meeting of the American Educational Research Association, San Francisco, California, March 31, 1989.
- CERVERO RM. A factor analytic study of physicians' reasons for participating in continuing education. *J Med Educ* 1981 Jan;56(1):29-34.
- WOLF FM, GRUPPEN LD, VANVOORHEES C, STROSS JK. Dimensions of motivation for continuing medical education of primary care physicians. *Eval Health Prof* 1986 Sep;9(3):305-16.
- MOORE-WEST M, NORTHRUP D, SKIPPER B, TEAF D. Information-seeking behavior among physicians practicing in urban and nonurban areas. *Proceedings of the Twenty-Third Annual Conference on Research in Medical Education* 1984: 237-42.
- GRUPPEN LD, WOLF FM, VANVOORHEES C, STROSS JK. The influence of general and case-related experience on primary care treatment decision making. *Arch Intern Med* 1988 Dec;148(12):2657-63.
- BARROWS HS, BENNETT K. The diagnostic (problem solving) skill of the neurologist. *Arch Neurol* 1972 Mar;26(3): 273-7.
- KASSIRER JP, GORRY GA. Clinical problem solving: a behavioral analysis. *Ann Intern Med* 1978 Aug;89(2):245-55.
- ELSTEIN AS, SHULMAN LS, SPRAFKA SA. *Medical problem solving: an analysis of clinical reasoning*. Cambridge, MA: Harvard University Press, 1978.
- LOCKYER JM, PARBOOSINGH JT, MCDUGALL GM, CHUGH U. How physicians integrate advances into clinical practices. *Möbius* 1985 Apr;5(2):5-12.
- FERGUSON KJ, CAPLAN RM. Physicians' preferred learning methods and sources of information. *Möbius* 1987 Jan;7(1):1-9.
- MURRAY-LYON N. Communication in medicine: a study of how family doctors obtain information on recent advances in the treatment of rheumatic diseases. *Med Educ* 1977 Mar;11(2):95-102.
- STINSON ER, MUELLER DA. Survey of health professionals' information habits and needs: conducted through personal interviews. *JAMA* 1980 Jan 11;243(2):140-3.
- GRUPPEN LD, WOLF FM, VANVOORHEES C, STROSS JK. Information-seeking strategies and differences among primary care physicians. *Möbius* 1987 Jul;7(3):18-26.
- STINSON, *op. cit.*
- LOCKYER, *op. cit.*
- GRUPPEN, *op. cit.*
- GRUPPEN LD, WOLF FM, VANVOORHEES C, STROSS JK. Physician practice characteristics and primary care treatment decision making. 1989;in process.
- LOCKYER, *op. cit.*
- GRUPPEN LD, WOLF FM, VANVOORHEES C, STROSS JK. Looking for help: physicians' strategies for supplementing knowledge when confronting challenging problems. Paper presented at the Meeting of the American Educational Research Association, San Francisco, California, April 1986.
- STINSON, *op. cit.*
- GRUPPEN, *Physician practice, op. cit.*
- STINSON, *op. cit.*
- GRUPPEN, *Physician practice, op. cit.*
- MOORE-WEST, *op. cit.*
- STINSON, *op. cit.*
- STROSS JK, BOLE GG. Continuing education in rheumatoid arthritis for the primary care physician. *Arthritis Rheum* 1979 Jul;22(7):787-91.
- STROSS JK, BOLE GG. Evaluation of a continuing education program in rheumatoid arthritis. *Arthritis Rheum* 1980 Jul;23(7):846-9.
- WEINBERG AD, ULLIAN L, RICHARDS WD, COOPER P. Informal advice- and information-seeking between physicians. *J Med Educ* 1981 Mar;56(3):174-80.
- STROSS JK, HISS RG, WATTS CM, DAVIS WK ET AL. Continuing education in pulmonary disease for primary care physicians. *Am Rev Respir Dis* 1983 Jun;127(6):739-46.
- MAXWELL JA, BASHOOK PG, SANDLOW LJ. The role of

communication networks in physicians' adoption of innovations. Proceedings of the Twenty-Third Annual Conference on Research in Medical Education 1984:231-6.

35. *IBID.*

36. WEINBERG, op. cit.

37. MAXWELL, op. cit.

38. ROGERS EM, SHOEMAKER FF. Communication of innovations. New York: Free Press, 1971.

39. MOORE-WEST, op. cit.

40. FERGUSON, op. cit.

41. STINSON, op. cit.

42. *IBID.*

Received August 1989; accepted November 1989

FROM THE *BULLETIN* – 75 YEARS AGO

Dr. John S. Billings, bibliographer and librarian

By Henry M. Hurd, M.D., Baltimore, Maryland

The Library of the Surgeon-General of the United States Army had a modest beginning. . . . In 1868 through the use of what is known as the 'slush fund' turned in by Army hospitals, it had grown to 6,066 volumes and in 1871 to 13,330 volumes. In 1871 it had for the first time a handsomely printed subject as well as author catalogue which was introduced by the following memorandum:

That there is need in this country of a medical library of this character is sufficiently evident from the fact that, in all the public medical libraries of the United States put together, it would not be possible to verify from the original authorities the references given by standard English or German authors, such as Hennen, Reynolds, or Virchow. No complete collection of American medical literature is in existence; and the most complete, if in this country, is in private hands, and not accessible to the public; while every year adds to the difficulty of forming such a collection as the Government should possess. The books are now safely and conveniently arranged in the fire-proof building of the Army Medical Museum, and are accessible to the public under rules and regulations essentially the same as those for the Library of Congress.

Bull Med Libr Assoc 1915 Oct;5(2):37