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# Brief Communications

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## **Clinical Information Coordinator: A New Information Specialist Role for Medical Librarians\***

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THE DEPARTMENT of Orthopaedic Surgery at the Beth Israel Hospital in Boston has conceived and developed a program to consolidate the management of its clinical information needs. These needs include efficient access not only to the world's biomedical literature, but to departmentally generated patient information, research data, and instructional materials as well. The Clinical Information System (CIS), as the program is called, has five components: (1) an automated clinical file; (2) a clinical librarian service; (3) a departmental library; (4) educational materials for orthopaedic patients; and (5) assistance in manuscript preparation.

The system relies heavily on computers for storage and retrieval of information. Biomedical literature is accessed through the National Library of Medicine's MEDLARS, data bases available through Lockheed and the System Development Corporation, as well as the hospital's own PAPER CHASE [1] program. Departmentally generated information is organized for storage in the hospital's computer and may be accessed through the same terminal used for literature retrieval.

The concept of a CIS, directed by a clinical information coordinator (CIC), evolved from the concept of clinical librarianship. Clinical librarians, by their training in library science and their

unique experience as clinical librarians, have demonstrated their (1) grasp of the clinical milieu; (2) abilities in dealing effectively with clinical information in the form of medical literature; (3) knowledge of organizational methods involving bibliographic and vocabulary control; (4) capabilities in utilizing on-line systems; and (5) understanding of the design and implementation of such systems. These qualities provide the foundation of the CIS. They are necessary for both the conventional role as librarian and for a new role as manager of information generated by the orthopaedic department. Consolidation of these two roles in the person of the CIC is a practical and effective approach to managing the information needs of a clinical department.

The Department of Orthopaedic Surgery was established at the Beth Israel Hospital, a Harvard University teaching facility, in the summer of 1978. Its responsibilities include patient care, undergraduate and graduate medical education, and clinical and biomechanical research. There are an estimated 500 out-patients and 100 in-patients seen monthly. Currently, there is a full-time chief of service, one full-time associate physician and eight attending physicians. The department also has a chief resident, rotating every six months, and three junior residents and two interns, rotating every three months. During the year, an estimated ten medical students study in the department. The department also includes an orthopaedic biomechanics laboratory. The laboratory's director is a Ph.D. in theoretical and applied mechanics. The multidisciplinary nature of the research done in this laboratory has necessitated the employment of representatives from engineering, biological, and medical sciences. Faculty and students from both Harvard and the Massachusetts Institute of Technology are active participants in the laboratory's work.

In order to meet the diverse information needs of the department members, the CIS has been divided into the five components mentioned previously. So that the reader may better understand the functions of the CIC, we will describe in some detail these components.

### CIS COMPONENTS

The first component, the automated clinical file, consists of data gathered for prospective clinical

\*Based on a paper presented by Madeleine E. Kolisch Savit on June 18, 1980, at the Eightieth Annual Meeting of the Medical Library Association, Washington, D.C.

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studies (PCS) and an on-line patient index. The PCS involve following a selected population over a period of time to monitor certain aspects of their health. These aspects will vary depending on the study. As an example, when a patient first presents and is selected for inclusion in the cervical spine clinical stability prospective study, extensive data are collected, including a stability checklist, x-ray findings, neurological exam results, management, complications, and outcome. The CIC collaborates with participating physicians to design a protocol that will ensure uniform collection of data. As a clinical librarian, the CIC has become familiar with the clinical concepts involved and is well qualified to organize the collection and recording of this information for inclusion in a data base.

In addition to the design of an information collection protocol, the CIC assists in the studies by ensuring that previous studies and background materials are reviewed, by compiling relevant reprints, and by making sure that the protocol records are completed.

The on-line patient index permits information on all patients managed in the department to be retrieved quickly. The information includes the patient's identifying data, date of admission or clinic visit, and diagnosis and treatment, which are coded using the *International classification of diseases, 9th revision, clinical modification* (ICD-9-CM) [2]. This index is used to access cases for educational purposes and for clinical review articles written for publication.

The second component of the CIS is the clinical librarian service. Clinical librarianship was fostered by the need to make the burgeoning biomedical literature more accessible to clinical staff [3-5]. The rapid proliferation of clinical librarian programs both nationally and internationally indicates their value, as do several reports confirming that clinical librarians favorably influence the quality of both education and patient care [6-8]. The CIC, as clinical librarian, attends daily x-ray conferences, weekly grand rounds and walk rounds, biweekly hand and fracture conferences, and monthly spine and complications conferences. When an area of some doubt or controversy surfaces, the CIC will search the bibliographic data bases and provide photocopies or relevant publications to an individual designated to follow up the topic. This individual will present a summary of the readings to other staff members. Articles copied may be selected by the CIC alone or in consultation with the reviewer. The resulting bibliographies and reprints will then be incorpo-

rated into the departmental library. Apart from this formalized approach, members of the department may at any time request reprints or computerized literature searches from the CIC.

The departmental library, the third component of the CIS, is small and in no way attempts to supplant the hospital library. Its function is simply to make more accessible materials of intrinsic value to the department but of limited interest to others. It contains highly specialized books and journals, reprints, bibliographies, x-rays, 35 mm teaching slides, photographs and microscope slides of tissue pathology. Most of these items are processed by the CIC for storage and automated search and retrieval via the hospital's computer.

At present, 850 items have been subject indexed and entered into the hospital's PAPER CHASE program, which affords easy access to reprint files by author, title, subject, or journal title. This has been done in lieu of a card catalog. The CIC has assembled a subject thesaurus for on-line searching of the collection and has written a guide to assist others in retrieving materials. The thesaurus is based on *MeSH*, but freely incorporates terms from the clinician's working vocabulary to accommodate the highly specialized nature of the collection.

The fourth component of the CIS is a collection of educational materials for patients about orthopaedic conditions and procedures. This aspect of the CIS is still very much in its infancy. However, we plan to develop and maintain a collection of items that will be made available to patients in response to questions about illness, treatment, self-care, and prevention.

Finally, having monitored the PCS from their inception, the CIC helps to prepare and edit manuscripts based on these studies and collaborates in their publication. The CIC also assists with clinical review articles for publication. This last component of the system maximizes the benefits of clinical data gathered in the department.

#### DISCUSSION AND CONCLUSIONS

A significant problem that faces departments in academic medicine today is the effective management of clinical information needed for and generated by patient care. The amount of biomedical information has increased exponentially [9]. Clinical librarians have helped to alleviate the problems of access resulting from this information explosion. This report describes a program that expands the clinical librarian's role to that of a clinical information coordinator. The new concept involved here

is one of employing the clinical librarian's understanding of the clinical setting, knowledge of data base design and function, and skills in information organization to effectively manage information produced as a result of patient care by the department. While these data are always being generated, they are not always recorded in an organized manner and are more rarely presented in a format suitable for analysis. The design of data collection protocols is one means of overcoming this difficulty and of harnessing the information for optimal use in research and teaching.

By means of clinical data protocols, our CIS has established a data base that allows us to conduct prospective clinical studies. A prospective study involves the detailed recording of well thought out and medically sound plans for diagnosis and treatment, which, when reviewed, permit one to make reliable decisions for future management of individual patients. Although a carefully designed prospective clinical study is a highly reliable source of information, the busy clinician often cannot budget the time needed to implement such a study. Consequently, few such studies appear in the literature and much valuable clinical experience is lost. A bibliographic search of the MEDLARS data base showed that, of 1300 clinical studies published in four leading orthopaedic journals from January 1966 to January 1979, only 73 (5.6%) were prospective. We believe that this survey documents the need for a system that can save the clinician's time and simultaneously permit completion of PCS.

Cox et al. [10] note that "systematic data recording has to compete with other activities for the physician's time." They suggest the employment of a "paramedical data specialist, who can give the activity [data collection] the time and attention it requires." Further, they contend:

Although this does add to the cost, it is economical when viewed in the context of the common profligate waste of valuable information flowing from our expensive diagnostic and therapeutic procedures [11].

Most clinical departments would welcome the services of a librarian on their staffs. For many, though, it would be seen as a luxury. However, when the librarian's abilities are used to facilitate all the information needs of the department—not

simply those relating to bibliographic access—the value of such a staff person is greatly enhanced.

Our Clinical Information System was founded in the belief that the flow of biomedical information through departments can and should be more effectively managed and that medical librarians are well-suited to the task. The system is readily adaptable to other hospital-based academic clinical units. The CIS has proven successful in the Department of Orthopaedic Surgery at the Beth Israel Hospital.

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*Received January 29, 1980; revision accepted July 3, 1980.*