

Clinical Medical Librarianship: A Review of the Literature

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ABSTRACT

The history and evolution of clinical medical librarianship are analyzed and traditional and modified approaches, including LATCH, are reviewed. Cost and evaluation methods are outlined, indicating benefits and disadvantages of clinical medical librarian (CML) programs. The future of CMLs is explored.

A REVIEW of the literature reveals that clinical medical librarianship has not been analyzed from a historical perspective. This article reviews the literature and draws conclusions about the potential for and evolution of clinical medical librarian (CML) programs.

DEFINITION OF CML

CML programs, in part, evolved to meet clinical information needs better. Immediacy of patient care requires that pertinent information be shared quickly by clinicians. Yet doctors have not always relied on traditional library services to meet clinical information needs. One of the major reasons is that doctors' "free time" usually falls between 10:00 P.M. and 8:00 A.M., when most libraries are closed [1]. Other reasons the library is not the first place doctors visit are: traditional library services take time (more time than conferring with a colleague, for example); extraneous or unusable information may result from the visit; physicians sometimes lack the skills needed to locate case-related materials; and physicians' time spent in searching the literature may be an unacceptable manpower cost [2].

In the early 1970s health sciences librarians sought new ways to provide clinical information. The emergence of rounding health care teams offered a new possibility. Inpatient interdisciplinary rounds began to include pharmacists, social

workers, nurses, nutritionists and psychologists [3]. Librarians saw a place for themselves on the health care team. Clinical pharmacists served as an impetus and role-model for librarians. Clinical pharmacy programs began in the late 1960s [4]. A correlation already existed between pharmacists and librarians. Both of these professions customarily offered a passive, product-oriented service. Clinical pharmacists encountered problems changing their image. Mosby and Naisawald [5] state that "a look at some of the literature reveals acceptance as the major hurdle—acceptance of the pharmacist's knowledge and education as sufficient" to entitle the clinical pharmacist to a place on the health care team. Librarians would face similar problems. CMLs, in the 1970s, were first defined as medical literature specialists who accompanied physicians and medical students on rounds, then returned to the library to search for pertinent care-related articles [6].

HISTORY OF CML PROGRAMS

Gertrude Lamb originated the concept of the CML or the clinical librarian, as it is currently called, at the University of Missouri-Kansas City (UMKC) School of Medicine. In 1971 Dr. Lamb obtained a National Library of Medicine (NLM) grant that enabled her to pioneer clinical librarianship at UMKC from May 1, 1972, to April 30, 1975 [7, 8]. In fall 1973, Dr. Lamb left Kansas City to serve as director of the Health Sciences Library at Hartford Hospital in Connecticut. Virginia Algermissen, Lamb's successor, continued the CML services at UMKC. Under a two-year grant from the U.S. Public Health Service, two CMLs at Hartford Hospital accompanied physicians on rounds at the University of Connecticut (Farmington) Health Center Hospitals [9, 10, 11].

Other CML programs appeared in various health care settings after Dr. Lamb spoke about the innovative UMKC program at the 1972 annual Medical Library Association (MLA) meeting in San Diego. Table 1 selectively lists and describes

*The author initiated a CML program in conjunction with the Department of Medicine at Sacred Heart Hospital, Yankton, South Dakota, from 1976 to 1977.

TABLE 1
SELECTED CHRONOLOGY OF CLINICAL MEDICAL LIBRARIAN (CML) PROGRAMS

YEAR	LOCATION	DESCRIPTION
1967	Washington Hosp. Ctr., Washington, D.C.	Initiated LATCH program; attached articles to charts upon request
1971	U. of Missouri, Kansas City	One CML on rounds; two more CMLs added 1972
1973	Cedars of Lebanon, Los Angeles	One librarian rounded in surgery; pediatrics rounds late 1973 and obstetrics six months later
	U. of Washington, Seattle	One librarian rounded three times weekly in Neonatal Intensive Care and second librarian rounded twice weekly with orthopedics
	Cook County Hosp., Chicago	Rounded weekly with diversified pulmonary health care team
1974	Hartford Hosp., Farmington, Conn.	Two librarians rounded with pediatrics and surgery teams
	Washington U., St. Louis	CMLs attended residents' reports; late October CML began rounds
1975	Yale-New Haven Hosp., New Haven	Four CMLs assigned to pediatrics, psychiatry, medicine, and surgery
	McMaster U., Hamilton, Ontario	CML served patients, families, and health professionals, emphasizing the nonphysician
	Riverside Methodist Hosp., Columbus, Ohio	CML rounded weekly; Riverside not affiliated with medical school in conjunction with the program
1976	Los Angeles County Harbor, UCLA	Weekly patient care ob/gyn conferences attended
	SIU, Springfield	Program grew to encompass seven clinical departments and two CMLs
1977	Tufts U., Boston	Attended daily medicine conferences; in 1980 prepackaged articles for routine placement on charts—Patient Care Related Reading Program
1978	UCLA Biomedical Library	Two CMLs attended biweekly cancer chemotherapy conferences, rounds and teaching conferences
	Stollerman Library, Memphis	Services offered to clinical branch of University of Tennessee Health Sciences Library
	Wake Forest U., Winston-Salem, N.C.	CML program part of subscription information service for radiologists and radiotherapists (INFORAD) at Bowman Gray School of Medicine
	Thomas Jefferson U., Philadelphia	Services to nursing staff including daily report with Maternity and Newborn Unit
	Framingham Union Hosp., Mass.	Modified CML services including LATCH and morning reports
1979	Beth Israel Hosp., New York	Clinical Information System started with Department of Orthopedic Surgery
	St. Luke's Hosp., Cleveland	Program started with medicine and psychiatry; two part-time CMLs
1980	West Suburban Hosp., Chicago	Attended rounds weekly for three months with rotating medical service
	U. of Cincinnati	Two CMLs attended morning report in conjunction with Department of Medicine
1981	Roswell Park Memorial Inst., Buffalo	Served nine oncology nursing units through visits, not rounds

programs that followed Lamb's lead. These programs are further described throughout the paper.

PURPOSE OF A CML PROGRAM

Published reports agree on reasons that CML services were offered: to provide information quickly to physicians and other members of the health care team; to influence the information-seeking behavior of clinicians and improve their library skills; and to establish the medical librarian's role as a valid member of the health care team. In addition, there was a need for a core of user-oriented rather than subject-oriented information [12].

CMLs attended rounds and/or patient-information conferences to identify information needs. Once these needs were targeted, they ran a manual or computer search for information on specific topics. Searches were also run for information on basic patient care management, therapy and complications, the possibility for original investigation, and for a more complete patient medical history [13, 14].

APPROACHES TO CML SERVICES

CML services, although dependent on staff size and financial resources, were successfully performed by both hospital and academic libraries. Some larger libraries established more than one CML position or had two half-time CMLs. Hospital librarians with little or no support staff attended rounds in addition to regular library duties. A clinical library branch offered a CML program to meet the information needs of clinicians who couldn't get to the main library [15].

CMLs averaged three hours per week on rounds. Clinical conferences and reports took less time, depending on the number attended per week. Computer or manual searches averaged another four hours. CMLs chose and distributed pertinent articles or a topical bibliography to appropriate health care members. Hutchinson et al. [16] suggest four criteria for literature selection: 1) currency, 2) abstracted articles, 3) review articles, and 4) discussions of diagnosis or therapy.

In most cases, MEDLINE searches answered patient-care questions quickly and efficiently. Greenberg et al. [17] report that MEDLINE was used 95% of the time. The CML program at Los Angeles County Harbor-UCLA Medical Center Library generated an average of 100 extra searches per year [18]. Other searching resources included

Excerpta Medica, Science Citation Index, and textbooks [19]. Steen [20] reported on the use of interlibrary loans to fill CML information needs. Often information needed was only available via interlibrary loan, adding another dimension to the CML network.

Completed searches were kept in various file locations. Using the library as a storing place, Greenberg et al. [21] circulated a newsletter announcing searches. Roach and Addington [22] filed a subject card for each search in the card catalog. At the Harbor-UCLA Medical Center, Medical Subject Headings (MeSH) terms were used to classify the CML-generated searches, and the searches were recorded in a loose-leaf notebook with an alphabetic subject list [23]. White et al. [24, 25] started a departmental library for the Orthopedics Department while Claman [26] kept files in an outpatient clinic and nursing stations. The CML at Thomas Jefferson University set up a reprint file at the Maternal and Newborn Care Nursing Station, posted selected abstracts, and copied articles of interest for nurses [27]. Upon return, the articles were placed in a vertical file. Coliainni [28] attended three different rounds groups and each group housed their material differently: pediatrics kept its own resource file; surgery had a notebook in its departmental library; and obstetrics and gynecology requested articles from the CML.

Marshall and Hamilton [29] started a unique CML program for patients, their families, and health care professionals with special emphasis on the nonphysician. A few photocopied articles were posted on the appropriate wards, bulletin boards, or in conference rooms. Articles were removed after a week, placed in folders by MeSH descriptors, and filed on the ward.

Beth Israel Hospital in Boston integrated its approach to clinical medical librarianship [30, 31]. The library, in conjunction with the Orthopedic Surgery Department, developed the Clinical Information System (CIS). The Clinical Information Coordinator (CIC) attended daily X-ray conferences, weekly grand rounds, biweekly hand and fracture conferences, and monthly spine complications conferences. The CIC then provided a summary and copies of relevant readings to the physician or team member responsible for follow-up. Other components of the CIS included: an automated clinical file with Prospective Clinical Studies (PCS) data and an online index of patients; a departmental library providing access to reprints

through PAPER CHASE†; a patient education collection of orthopedic conditions and procedures; and manuscript preparation assistance based on the PCS data.

ADDITIONAL CML ROLES

CML roles altered or expanded according to perceived need or existing resources. These modified programs took various forms.

In 1967 the Washington Hospital Center started the first program that took patient-related literature to clinical staff [33, 34]. Sowell defines Literature Attached To the CHart (LATCH) as a "collection of a few good articles on some aspects of a patient's illness which is attached to the chart at the request of any health care person attending the patient." By 1975, requests resulted in 1,000 "information packages" that were kept and updated in the library for future use. Clevesy [35] combined LATCH with a CML program at a small teaching hospital. LATCH was introduced, at the request of the chief medical resident, six months before CML services began. Clevesy attended morning report but not rounds and provided answers to questions through manual or computer searching. At UMKC three CMLs each utilized a different information dissemination technique [36, 37, 38]. The CML who used LATCH attended house staff morning rounds each day. Each LATCH included bibliographies for further investigation. A publication called *Current References* developed as a result of LATCH. A master file of the LATCH searches called "Latest Topics" was also maintained.

Three community hospitals in Boston started a Patient Care Related Reading Program (PCRRP) [39]. Unlike other CML or LATCH programs, this one eliminated on-demand service. Articles were prepackaged for routine placement on patients' charts or for delivery to a particular clinician. Each packet dealt with one preselected topic. The purpose of the PCRRP was to "assess the relevance of preselected literature to current cases, to study physicians' use of literature routinely attached to charts . . . to determine if reading this literature would have a direct effect on patient care, to ascertain if evidence of such reading could be documented, and if so, to provide a basis for

granting Category 1 Continuing Medical Education (CME) credits."

Norris Medical Library created another prepackaged outreach information approach with the Schools of Medicine and Pharmacy at UCLA [40]. This program was a "noninvasive continuing medical education project focused on the physician's office practice." A review committee of one M.D. and two clinical pharmacists analyzed the prescribing behavior of 100 practicing physicians. A project librarian participated in the review meetings, noting information needs. Each physician received an information packet prepared by the librarian. Emphasis was on education rather than regulation.

Harmon et al. [41] compiled ten comprehensive preclinical primers for CMLs on major disorders, disease states, and body systems. These primers were based on the assumption that a "small core of health care knowledge and printed literature serves as a base for solving a high percentage of clinical problems." Primers were used before, during, or after rounds.

Response to "packaged" programs was positive, although Sowell's observation about LATCH may apply to all CML efforts:

The basic assumption underlying the LATCH program is that the patient receives better care if the personnel treating him are familiar with information in his LATCH. At present no method has been devised to determine whether the LATCH has this desired effect [42].

Babish and Warner [43] provide a comprehensive plan for providing LATCH services, although the method would be useful in estimating value of any CML service.

CML PROGRAM EVALUATION

CML or LATCH programs need to be evaluated for several good reasons: to determine the quality of the service; to assess information delivery methods; to measure costs; and to gain user feedback [44]. Evaluation also measures educational benefit to clinicians, medical students and other users. Table 2 illustrates types of CML evaluation and cost studies.

Surveyed recipients of CML services cited many benefits, which included: enhancement of patient care; physician, health care team, and medical student education; greater awareness of library services and resources; time saving for physician and health care team; exposure to a wider variety of journals; and information sharing among col-

†PAPER CHASE is a computer program set up by Gary L. Horowitz and Howard L. Bleigh at Beth Israel Hospital in 1981 to "allow users to search medical literature by author's name, journal of publication, title word or medical subject heading (MeSH)" without relying on a trained librarian [32].

CLINICAL MEDICAL LIBRARIANSHIP: A REVIEW OF THE LITERATURE

TABLE 2
COST & EVALUATION STUDIES

INSTITUTION	EVALUATION METHOD	EVALUATION HIGHLIGHTS	COST CONSIDERATIONS
U. of Washington, Seattle	Survey 6 mo. after service began; 3 p. questionnaire and cover letter listing sample of requested topics; follow-up survey 1 mo. later	Educational value; clinical importance in diagnosis and treatment; recipients saved time; library awareness increased	Cut cost 51% by reducing rounds to 1 less time per week after survey
Yale Medical Library, New Haven	Closed-question survey with room to explain negative responses	CML well-accepted; education and patient care enhanced; saved time; changed info-seeking behavior	N/A
McMaster U., Hamilton, Ontario	Picked 8 health care team groups—4 control and 4 study; both groups impartially interviewed after 6 mo. service and again 3 mo. after service ended; follow-up surveys	Study groups' info-seeking behavior changed; articles and patient care packages used after service ceased	Cost-effective model; useful for community hospital
UCLA Medical Center, Los Angeles	1st questionnaire 1976; 2nd in 1978 after program revision	Department usage increased by 120%; increased library consultations and awareness	\$1,440/yr. for 10% CML time and \$2,940 for searching
Houston Academy of Medicine—Texas Medical Center	Attached questionnaire to CML materials; usage statistics kept and analyzed	CML did not restrict freedom of discussion; team asked more questions; saved time; educational impact; service continued on permanent basis	Dept. Med. paid 15¢/copy or \$2.11/request; CML cost \$10/hr. for 1 hr. conference and 1.5/hr. follow-up; no searching charges
U. of Missouri, Kansas City	Questionnaire sent to medical school graduates 6 mo. into their residencies; followed up 3 mo. retrospective study of CML impact and present library behavior	CML available and helpful; enhanced ability to grasp problems and find information; personalized instruction; overdependence on CMLs not evident	N/A
U. of Cincinnati	Log kept of: topic; requester; research and assembly time; MEDLINE and copying costs. Follow-up questionnaire	High-quality information received; patient care management and education value; program permanently adopted with subsidization from Department of Medicine	Avg. 3.5/hr./request with morning report; packet cost \$50–75 (salary and materials including MEDLINE)
Washington U., St. Louis	Resident interviews; questionnaire w/ea. search; service offered alternating months, with call-in service through library intervening months; usage statistics	Information useful; sharing tool; found service useful but not willing to pay for it	\$17/mo./resident including staff time

leagues. The library gained increased visibility, which promoted library services. Clevesy [45] noted that "as library services increased so did the expectations of library clientele." The CML acquired new knowledge of medical terminology and procedures and was exposed to the clinician and health care setting.

Objections to CML programs also appeared in evaluations. A CML on rounds added to an already overcrowded situation. Sometimes the CML misunderstood questions during rounds and provided irrelevant or unsolicited information. The use of a CML as a primary source of information was questioned, as well as CMLs' medical terminology knowledge [46, 47]. Some users identified with the CML as an individual rather than part of the library team [48]. Traditional library services at Southern Illinois University School of Medicine (SIU-SM) suffered because of a CML program there [49]. CMLs spent 19% of their time on the service during the five-year period. Reference services decreased by 38%. After a survey, SIU-SM discontinued the program.

COST CONSIDERATIONS

Cost was often another problem for CML programs. Halbrook [50] notes that "the few reports of discontinued programs indicate the lack of a budgetary support for the clinical librarian is the major reason for a program's demise." In all but a few cases, the library subsidized the entire program, including personnel, searching charges, photocopying, and file storage. The Washington University School of Medicine evaluation showed that residents would not pay for CML services [51]. The majority said they considered such a service part of their education.

But cost-effectiveness can be taken one step further, assuming that CML services promote education that aids patient care, as surveys strongly indicate. Scura and Davidoff [52] compared the cost of CML services and standard laboratory testing for case-related patient information. Their report states that CML services cost \$8.00–20.00 for a MEDLINE search, \$10.00 for one hour of the librarian's time, and another \$2.00 for photocopying—for a total cost of \$20.00–32.00. This cost, the authors point out, is much less than one chest X-ray or one set of electrolyte studies.‡ The authors state that while a review of the literature,

like a lab test, rarely leads to new diagnostic or therapeutic interventions, both may serve as a "stop function in reducing patient risk, discomfort, and overall medical costs." Grose and Hannigan [53] liken CML costs to other educational expenditures in a Family Medicine Program. At \$10.00 per hour, the authors conclude, a CML program offers a "cost-effective customized support service for problem-specific continuing education" when compared to the costs of speakers, continuing education courses, subscriptions to journals, or Audio-Digest-Family Medicine.

Clearly CML programs need to be constantly evaluated by both the librarian and users. The service must provide mutual gain for the library and the departments employing the service. There are many factors to consider in each individual library situation before offering a CML service.

Lamb sees a need for more objective analyses of the clinical librarian, although she adds that "ten years provides adequate time for clinicians and other health professionals to accept the CML" [54]. Lamb describes CML programs as a three-part "linear progression of events" from acceptance to affecting patient care to influencing the information-seeking behavior of health professionals through teaching information skills. The fourth stage is a "system (with) elements of the first three stages utilized to evaluate and extend clinical librarianship." The concept and future of CMLs has reached the fourth stage.

THE FUTURE OF CML PROGRAMS

The CML can continue to bring information to the health care team. CML service rose out of a desire to meet clinical information needs by complementing traditional library services [55]. Even modified services that do not include rounds fulfill the original purpose set forth by CML programs. New technology and more sophisticated means of information transfer need not eliminate CML services but program mechanics must be studied carefully to best employ new technology in a CML program.

The Matheson and Cooper report [56] speculates that in the next five to ten years as a result of LATCH and CML services "specialized literature reference files for all clinical services" will be developed for call-up at any time on terminals in offices, nursing stations, and elsewhere. The librarian will participate in updating files by reviewing the literature. As files become more complex, system integration occurs and the physician and librarian continue their close working relationship.

‡According to University of Wisconsin Hospital and Clinics a standard chest X-ray costs \$36.40 and one set of electrolyte studies costs \$22.00.

The report concludes that "eventually . . . the knowledge bases of medicine become available for instant recall . . . information that is stored in files can be retrieved by human speech commands instead of keyboard instructions and the output is displayed either visually or in audioformat." The physician receives the most current information available as a result. Winant [57] adds that the library with the terminal will be the access point to all this information.

Many libraries are already involved in setting up or cooperating with a telecommunications network. Other libraries are struggling to maintain and justify already inadequate staffing situations. There is no homogeneity among health sciences libraries; resources, including money, vary widely. The needs of health care personnel, especially clinicians, however, do not. Evaluations clearly show that CML services cost money and are a luxury reference service. Arcari voices support for the future of CMLs based on cost-recovery for the service:

In the early 1970s clinical librarians were the link between the inpatient service, online computer citations and the photocopy machine. In the 1980s, with user-friendly access to full-text databases, the instructor role of the clinical librarian may supersede that of the coordinator for earlier telecommunications and copying technologies. What would not be lost is library entree into the information searching process. Clinical librarianship can serve to maintain the presence of an information specialist in a clinical setting even when this presence is on a fee basis [58].

If CMLs are to survive, the service must be integral to the library, must be in step with the times, and must include a cost-recovery plan. Traditional reference services must not dwindle because of specialized outreach programs. Legal issues associated with CML and LATCH services need to be taken into account [59]. Future efforts to offer CML services must be viewed in light of new technological advances to maximize and insure a rapid clinical information dissemination. This, after all, is the original objective of clinical medical librarianship.

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