CHAPTER 2

REVIEW OF RELATED LITERATURES

According to C. H. Busha and S. P. Harter¹ (1980), the purpose of review of literature or literature search is to attempt to identify, locate and synthesize completed research reports, articles, books and other materials about the specific problems of a research topic. It enables the researchers to know about other research projects in a similar field, to narrow or describe research problem and relate the topic of research in the context of larger panorama.

For the present study, a systematic review of the literature on the conceptual topic was conducted to identify related research and the development of the concept of clinical librarianship as well as trends in the medical librarianship and evaluation of clinical librarian programmes. For this chapter, the researcher has made an attempt to review articles published in journals, survey reports, dissertation, case reports and chapters taken from books relevant to the study, beginning from the years 1949 to 2012. The areas considered relevant to the study are the following:

1. Health Science Librarianship
2. Medical Librarianship
3. Hospital Librarianship
4. Evidence-based Librarianship
5. Clinical Librarianship
6. Medical Library Education

2.1 Health Sciences Librarianship

More than fifty years ago in 1971, the National Library of Medicine\(^2\) pioneered online access to the literature with the introduction of Medical Literature Analysis and Retrieval System (MEDLARS) online i.e. Medline to provide bibliographic searching capability for medical schools, medical libraries, hospitals and research institutions throughout the country. Medline initially consisted of a subset of 236 of the top medical journals indexed in Index Medicus and was viewed as an interesting supplement to manual searching. With the time it was used routinely as the preferred method of access by thousands of librarians and healthcare professionals. Some faculty, though, still relied on the traditional methods of asking a colleague, scanning a personal copy of a journal and, of course, going to the library. Traditionally, CD-ROM systems were only available in the library and doctors and librarians met each other there to discuss problems for searching.

L. Darling\(^3\) (1974) gave an overview of information needs and services in the health sciences since 1960, with emphasis on the services of the National Library of Medicine and some other government-funded systems for information dissemination. A. D. Kalaznu\(^4\) (1974) discussed about the arrangements comprising the healthcare delivery system and analyzed in terms of social organization with selected characteristics of the system that were pertinent to the study of diffusion and adoption of various types of innovations.

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Irwin H. Pizer (1978) described about biomedical libraries as a distinct and specialized group of special libraries with their unique services, user interactions and the growing trend towards patient and user education.

Agnes A. Roach (1979) discussed one of the most innovative methods of information delivery that was a clever response to the special needs of healthcare workers and concluded that with the great expansion of personnel and educational facilities in the healthcare field, health science librarians could enjoy being vital, contributing members of the healthcare team, as well as cooperating and sharing resources with other healthcare teams through the biomedical communications network.

William A. Clintworth, N. J. Gilman, P. R. Manning and J. A. Biles (1979) described a programme which incorporates library services into continuing medical education for physicians. The educational service was based on the actual needs of the physician rather than on his perceived needs. The needs assessment was accomplished by reviewing drug-prescribing habits. Current medical literature was then selected for the physician to coincide with his unique educational needs. The programme was further designed to evaluate the change in the physician's drug-prescribing habits as a result of his study of the literature received.

Gang L. Horowitz and H. L. Bleich (1981) gave an overview of PAPERCHASE, a computer programme that permits users to search medical literature by author's name, journal of publication, title word, or Medical Subject Heading (MeSH), as indexed by the National Library of Medicine. PAPERCHASE was installed in the medical library.
of Beth Israel Hospital in Boston, with a data base of 400,000 references – nearly all the articles shelved there. During the first year of operation, 1032 medical students, house officers, practicing physicians, and other library users, without formal instruction or user’s manual, conducted 8459 searches and displayed 399,821 references, 97,769 of which they selected for printing. Among users who conducted an initial search, 49 per cent returned to complete five or more searches, and 14 per cent returned to complete 20 or more. The large number of satisfied users and the low installation and operating costs suggest that PAPERCHASE could be a valuable means of providing widespread computerized bibliographic retrieval.

The publication of N. W. Matheson and J. A. Cooper (1982) report on the library’s role in the management of academic information in the academic health sciences center was a truly seminal work in the literature of librarianship. It suggested a solution, casting the library as a ‘stage one network node’ in the total organization of institutional information management.

Jitka M. Hurych and Ann C. Glenn (1987) surveyed the 150 institutional members of the Health Science Librarians of Illinois (HSLI) regarding their perceptions of ethical concerns. Among the issues addressed in the survey were library organization, personnel policies, and professional competency, along with the traditional concerns of professional versus personal values, privacy and confidentiality, access to materials, and materials selection criteria in a health sciences context. Based on a 60% response rate, survey results indicated widespread agreement on some issues and a

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conspicuous lack of consensus on others. Further research was suggested in order to assess the need for a separate ethical code for health sciences librarians.

Alexandra Dimitroff\textsuperscript{11} (1992) did a content analysis of research articles published between 1966 and 1990 in the Bulletin of the Medical Library Association. Four specific questions were addressed: What subjects were of interest to health sciences librarians? Who was conducting this research? How did health sciences librarians conduct their research? Did health sciences librarians obtain funding for their research activities? Bibliometric characteristics of the research articles were described and compared to characteristics of research in library and information science as a whole in terms of subject and methodology. General findings were that most research in health sciences librarianship was conducted by librarians affiliated with academic health sciences libraries (51.8%); most deals with an applied (45.7%) or a theoretical (29.2%) topic; survey (41.0%) or observational (20.7%) research methodologies were used; descriptive quantitative analytical techniques were used (83.5%); and over 25% of research was funded. These findings were consistent with those reported in the general library and information science literature for the most part, although specific differences do exist in methodological and analytical areas.

The Medical Library Association’s (MLA) Knowledge and Skills Task Force were appointed in May 1989. The task force decided to survey a sample of the membership to define the knowledge and skills required for competent professional performance and to enable MLA to establish educational policies which would ensure acquisition and maintenance of the necessary knowledge and skills throughout a professional

career. Fred W. Roper and M. Kent Mayfield\(^\text{12}\) (1993) published a report to present the initial findings of the survey, upon which MLA's educational policy statement, *Platform for Change*, was based.

Robert M. Braude\(^\text{13}\) (1997) described the evolution of health sciences librarianship over one hundred years. He concluded the study by saying that changing conditions required a continual review of this specialty education and willingness to modify it in order to prepare health sciences librarians for changing environment.

Maureen Dwyer\(^\text{14}\) (1999) did a Delphi survey to determine research priorities in the health library and information services sector in the United Kingdom as to their perceived value for the professional and impact on user needs and to identify areas suitable for collaborative research and found that there was a developing role for librarians as researchers, especially those who were proactive enough to become involved in multidisciplinary research teams. The likelihood of this happening must be placed alongside the weak research tradition amongst librarians. Investigating research priorities through the Delphi medium facilitated a consensus-based outcome in identifying a common agenda that should assist information professionals entering into, and competing in, wider networks and collaborative ventures within the healthcare sector.

Jonathan Eldredge\(^\text{15}\) (2002) showed that the cohort design has great potential for answering research questions in the field of health sciences librarianship, particularly


evidence-based librarianship (EBL), although that potential had not been fully explored.

Jonathan D. Eldredge\textsuperscript{16} (2003) said that the Randomized Controlled Trial (RCT) design offers the potential to answer far more EBL questions than had been addressed by the design to date. Librarians need only extend their horizons through use of the versatile RCT design into new subject domains to facilitate making EBL a reality.

Michael R. Kronenfeld\textsuperscript{17} (2005) did a study to identify trends in academic health sciences libraries as they were adapted to the shift from a print knowledgebase to an increasingly digital knowledgebase. This research was funded by the 2003 David A. Kronick Traveling Fellowship. In his conclusion he called for a national effort to develop a new model or structure for health sciences libraries to more effectively respond to the challenges of access and use of a digital knowledgebase, much the same way the National Library of Medicine did in the 1960s and 1970s in developing and implementing the National Network of Libraries of Medicine.

MLA members were surveyed by Ruth Holst and Carla J. Funk\textsuperscript{18} (2005) to gather background about the current state of expert searching in institutions. The survey results were intended to guide the recommendations of the Task Force on Expert Searching for promoting the importance of expert searching and implementing those recommendations. The survey supported the belief that health sciences librarians play a valuable role in searching, particularly in answering questions about treatment options and in providing education. It also highlighted the need for more expert


searching courses. There had been minimal discussion about the perceived need for expert searching guidelines in the institutions represented by survey respondents.

Gerald J. Perry, Nancy K. Roderer and Soraya Assar\(^1\) (2005) in their paper said that boundaries were disappearing between the sources and types of and uses for health information managed by informaticians and librarians. Definitions of the professional domains of each had been impacted by these changes in information. Evolving definitions reflected the increasingly overlapping research agendas of both disciplines. Professionals in these disciplines were increasingly functioning collaboratively as "boundary spanners", incorporating human factors that unite technology with healthcare delivery.

Another Delphi study was done by Logan Ludwig and Susan Starr\(^2\) (2005) to develop an expert consensus on the future of the library as place to assist health sciences librarians in designing new library spaces and found that how health sciences library space was used, would be far less consistent by 2015, as space becomes more tailored to institutional needs. However, the manner in which health sciences libraries developed and deliver services and collections would drastically change in the next decade. Libraries would continue to exist and would provide support for knowledge management and clinical trials, provide access to digital materials, and play a host of other roles that would enable libraries to emerge as institutional change agents.

Marcus A. Banks, K. W. Cogdill, C. R. Selden and M. A. Cahn\(^3\) (2005) sought to identify opportunities for partnership between the communities of public health


workers and health sciences librarians. Drawing on historical and contemporary experience, they presented an initial framework for forming collaborations between health sciences librarians and members of the public health workforce. This framework might stimulate thinking about how to form additional partnerships between members of these two communities.

Erin M. Watson\textsuperscript{22} (2005) investigated whether Canadian academic health sciences librarians found knowledge of the health sciences to be important and, if so, how they acquired and maintained this knowledge. Although more research needs to be done with a larger sample, he found that the subject knowledge continues to be important to Canadian academic health sciences librarians. Continuing education, rather than formal degree studies, was the method of choice for obtaining and maintaining this knowledge.

Bruce Madge and T. Scott Plutchak\textsuperscript{23} (2005) examined existing developments in international health librarianship and described some contemporary themes. They found that professional associations could provide a useful institutional infrastructure for addressing issues of international interest. Librarians should encourage their associations to develop these international initiatives and to seek out new and innovative ways to work together across international boundaries.

Caroline Sawers\textsuperscript{24} (2005) described that the Medical Library Bulletin of the Thames Regions reflected the development of health-service libraries over the 20 years it


existed. Originally begun as a practical aid to improving services by encouraging cooperation, improving communication and giving instructive advice, it charted the work of health service librarians and the growth of their services. The articles contained in it covered professional developments and wider political issues as they occurred, and illustrated the extension of the librarians’ knowledge and skills.

Ellen T. Crumley\textsuperscript{25} (2006) conducted qualitative research about the role of healthcare professionals and librarians involved with Complementary and Alternative Medicine (CAM). The goals were to identify resources these professionals use to explore the librarians’ role as well as their approaches to teaching and searching with respect to CAM, to acquire information about CAM education, and to connect with other librarians in the CAM field. The researcher concluded that a CAM librarian’s role was unique among many specializations in specific areas of CAM, and opportunities existed for librarians to partner with CAM groups. CAM information professionals’ major roles involved information access and retrieval and education. Further study was required concerning CAM consumer health, integrative CAM and conventional medicine models, and the librarian’s role in a CAM environment. CAM funding was a major concern.

Joanne Gard Marshall\textsuperscript{26} (2007) concluded his paper by saying that the value and impact studies will continue to be important resources for evidence-based practice as health information professionals’ deal with evolving user needs and new ways of delivering information to a variety of audiences.


Alison Brettle\textsuperscript{27} (2007) did a systematic review to determine what measures have been used; the extent to which they are valid and reliable; to provide guidance for health librarians who wish to evaluate the impact of their information skills training. Fifty-four studies were included in the review. Most outcome measures used in the studies were not tested for the key criteria of validity and reliability. Three tested for validity and reliability were described in more detail. Selecting an appropriate measure to evaluate the impact of training was a key factor in carrying out any evaluation. This systematic review provided guidance to health librarians by highlighting measures used in various circumstances, and those that demonstrate validity and reliability.

Ann Ritchie\textsuperscript{28} (2008) described the future perspective of health science librarianship and gave future visions for Continuing Professional Development (CPD) in Australian context. She had argued that health librarians were specialists within the health workforce, and as such, their CPD requirements were different from other areas of librarianship. This was evidenced in the increasing need for integration with national e-health directions and strategies, and in the trend towards service models based on multidisciplinary teams, knowledge management and clinical librarian/ informationist roles in different contexts of the health industry.

Hannah Rossall, C. Boyes, K. Montacute and P. Doherty\textsuperscript{29} (2008) suggested that librarians should build on their research capacity through better consideration of evidence based methodologies, hierarchies of evidence, improvement of research skills, and a collective attempt to identify research priorities. The importance of research capacity was being given in the Department of Health Research and


Development strategy and the use of networks in achieving this has been discussed, and it was suggested that the utilization of networks and collaboration should be undertaken and explored in more depth in developing research capacity in health librarianship.

Jeannette Murphy\textsuperscript{30} (2010) wrote an article derives from his interest in the relationship between Health Science Librarianship (HSL) and Health Informatics (HI). In the United States, health science librarians signaled the relevance of HI to their profession by creating a Medical Informatics Section within the Medical Library Association. He concluded that the two communities had many shared interests and could benefit from closer collaboration.

While the role of the librarian as an expert searcher in the systematic review process is widely recognized, librarians also can be enlisted to help systematic review teams with other challenges. R. Dudden and S. Protzko\textsuperscript{31} (2011) reviewed the contributions of librarians to systematic reviews, including communicating methods of the review process, collaboratively formulating the research question and exclusion criteria, formulating the search strategy on a variety of databases, documenting the searches, record keeping, and writing the search methodology. They also discussed the challenges encountered such as irregular timelines, providing education, communication, and learning new technologies for record keeping. Rewards included building relationships with researchers, expanding professional expertise, and receiving recognition for contributions to healthcare outcomes.

J. Murphy\textsuperscript{32} (2011) described the trends in health sciences librarianship in various countries and region. He found that whilst the mission of the health science library remains constant, librarians must find ways of adjusting their role and the services they provide to take account of changes in the external environment.

A. Booth\textsuperscript{33} (2011) briefly examined the development of knowledge translation, knowledge transfer and the knowledge broker role as constituting the next manifestation of the movement that brought us evidence based medicine and its derivatives. He also examined the extent to which health information professionals meet the specification for a knowledge broker role. In doing so he assessed the strengths and weaknesses of the profession when ranged alongside the five components of the knowledge transfer process i.e. problem identification; knowledge development and selection; analysis of context; knowledge transfer interventions; and knowledge utilization. The deficiencies also lie in a need for political astuteness and awareness and in a lack of knowledge of the most significant models of behavioral change. He concluded the paper by examining the potential for knowledge team approaches arguing that gains from a wider perspective that encompassed the entire knowledge process may be even more significant than the pooling of collective knowledge, skills and expertise.

K. Lasserre\textsuperscript{34} (2012) did a literature review to identify international issues in expert searching in health librarianship with Australian concerns. The result of the review showed that expert searching was a key role for health librarians, especially for those supporting systematic reviews or employed as clinical librarians answering clinical


questions. Although clients tend to be satisfied with searches carried out for them, improvements were required to effectively position the profession. Evidence-based guidelines, adherence to transparent standards, review of entry-level education requirements and a commitment to accredited, rigorous, ongoing professional development will ensure best practice.


H. Dollfuss et al. (2012) explored international trends in health science librarianship in the first decade of the 21st century with developments as reflected in their country - viz. Austria, Belgium, France and the Netherlands.

L. Haglund, K. J. Buset, H. M. Kristiansen, T. Ovaska and J. Murphy (2012) explored international trends in health science librarianship in the first decade of the 21st century with developments as reflected in their country - viz. Sweden, Denmark, Norway and Finland.

E. Lappa et al. (2012) explored international trends in health science librarianship in the first decade of the 21st century with developments as reflected in their country - viz. Greece, Italy, Spain and Portugal.


2.2 Medical Librarianship

Medical librarianship is a service profession. Medical librarians, sometimes called health information specialists, get information about medical treatments, research, procedures, tests, and equipment for health occupations workers, patients, consumers, and corporations. They help health occupations workers to provide quality care to patients, help patients find information, and provide information to healthcare industries.

Count D. Gibson (1949) described a plan for the organization of a circulating, on-the-spot reference library attached to a medical service, which would be available to the greatest number of the staff at the most convenient time.

J. Doe (1953) discussed about the opportunities for women in medical librarianship. Archibald L. Goodall (1954) argued that a librarian should develop the processes of thought and imagination. Beside the routine work of the library, medical librarians should know something about medical history and should be aware of classical work in most subjects. They might develop further interest in clinical matters to help their colleagues in their research.

William Dosite Postell (1957) discussed about and appealed for the research in medical librarianship. By presenting a few examples of such research it was hoped to provide a guide and inspiration to medical librarians to undertake original

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investigations in their profession. He argued that if medical librarianship wishes to become recognized as one of the learned professions, it must develop a tradition of research in all phases of its profession.

D. B. Dragonette44 (1973) said that the medical librarian in a hospital contributed to the quality of patient care by building a library which can provide promptly the information needed by all members of the treatment team, including medical and paramedical persons. The librarian was meeting his responsibility to the patient when he performed the duties of selecting materials, cataloging these materials speedily and thoroughly, and giving reference service to library users. An excellent hospital library and the services of a knowledgeable librarian can be a significant factor in the medical team's ability to provide superior patient care.

The literature of medical librarianship of Nigeria was reviewed by G. S. Belleh45 (1975). The staff structure of Nigerian University libraries and, in particular, of the medical libraries attached to them was restrictive, unprogressive, and un-conducive to the development of medical librarianship in Nigeria. These medical libraries should cease to be administered and regarded as just unavoidable appendages of the main university libraries. They should be independent, full-fledged libraries of their own, recognized as full academic departments of their respective colleges or faculties, with their heads being in no way inferior in status to other heads of academic departments. The granting of faculty status to Nigerian University librarians should go the whole way and let the principle of multiple professorships was applied to the staff structure of university libraries. Efforts were being made to effect

bibliographic organization of Nigerian medical literature. A national library of medicine for Nigeria, however, humble its beginning, should be established.

C. H. Dobroski and D. D. Hendricks46 (1975) said that an overabundance of duplicate journals without an efficient and economical method of distribution caused one library's staff to reassess traditional methods of dispersal. A simplified form for listing duplicates was devised. In conjunction with the Regional Medical Library Programme (RMLP) and the extension programme, lists of duplicates were distributed to hospital and clinical libraries. These libraries selected materials to strengthen their ability to fill information needs at the local level and to conserve RMLP support for esoteric and expensive materials. In a two-year period, 86,000 individual pieces were distributed. Some lessening of interlibrary loan requests from heavy users was documented. In an evaluation survey users expressed satisfaction with the programme. The successful use of the duplicate programme will lead to a further experiment – the library will attempt to fill interlibrary loan requests for common journals with hard copy rather than photocopy in a cost and time reduction effort.

J. W. Yeoh47 (1976) said that articles advising the physician on how to keep up with his continuing education rarely mention the medical library as a useful aid. However, there was a potentially revolutionary change taking place. The clinical medical librarian, rather than remaining passively within the library, was actively joining the healthcare team by going on rounds with the physicians on various services. The purpose of his study was to ascertain the physician's clinical information needs and then provide them with a few relevant and current articles within a short time. The

inclusion of a medical librarian on patient visitation rounds was first initiated at Cook County Hospital in Chicago, on pulmonary medicine rounds. This project appeared to be of great benefit to other members of the health team.

D. Bishop48 (1976) examined the uses of diversity in medical library activities and personnel. The concept was extended also to the broader field of librarianship and to some forecasts of future directions for medical libraries.

Bette Greenberg49 (1976) reported the results of a statistical analysis of professional use of the National Library of Medicine's bibliographic retrieval system, MEDLINE (Medical Literature Analysis and Retrieval System on-Line), at a large medical school library. Results indicated that (1) demand for MEDLINE service is primarily research oriented; (2) frequency of use bears a relationship to rank and departmental affiliation; (3) broad and comprehensive searches are requested more frequently than searches for specific information; (4) usage shows an interesting curvilinear relationship with age and status of the user; and (5) grant funds and support correlate with the number of searches requested.

Why was the literature on the ethics of librarianship so sparse? Some of the codes of ethics proposed or officially adopted during this century were examined by H. Crawford50 (1978), with an informal commentary on the reasons why they seem to have aroused so little sustained interest and discussion. Attention was directed particularly to library-user relationships and to some of the unique ethical situations in medical libraries.

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Joseph W. Palmer\textsuperscript{51} (1978) did a content analysis of Job Advertisement in the MLA News, 1961-1977 to find out the changes in medical librarianship. The result reflected a growing interest in library automation and computer-based reference service. The period was marked by libraries working independently to automate their own technical services activities and, in the case of pharmaceutical companies, to develop their own reference data bases. These years also saw the beginnings of networking in medical libraries, with the establishment of the Regional Medical Library Programme and MEDLARS formulation centers.

Dissemination of new medical information to the practicing physician is a complex and often faulty process. To examine the magnitude of this problem, J. K. Stross and W. R. Harlan\textsuperscript{52} (1979) surveyed primary care physicians to determine their knowledge of the results of the cooperative trial of photocoagulation in diabetic retinopathy. Despite the acknowledged relevance to their practice, only 28\% (38/137) of family physicians and 46\% (42/91) of internists were aware of the study results ($P < .001$). Respondents were asked to manage two patient problems involving diabetic retinopathy. Only 33\% (75/229) handled both correctly, although the retinopathy photocoagulation study had been published 18 months earlier. These findings indicate that results from clinical trials may not be disseminated to practicing physicians and, therefore, not incorporated into practice. Greater attention should be directed toward making findings from clinical trials available to practitioners.


In the year 1980, Fourth International Congress on Medical Librarianship\textsuperscript{53} has been held at Belgrade, Yugoslavia. During this congress Drafting Committee prepared a report on plans for the future. It has been resolved that academic medical librarians should undertake an educational role and help to improve the knowledge of users. It had also been resolved that programmes of self-instructional (slide/tape) materials for students and teachers of health sciences be developed which would motivate them and enable them to retrieve and use the resources of an information center more efficiently and prepare them to continue their education independently.

E. Love\textsuperscript{54} (1987) said that information science is changing from an applied service-oriented activity to a basic research discipline. The library profession must earn a central place in this endeavor, and must address a number of important issues. These included ownership and intellectual property rights, a stronger research component for the profession, development of quality assurance systems for health information services and a conceptual framework for training and career development of health sciences library technicians. The future of medical librarianship as a profession depended on a lasting commitment to research, a clear vision of the profession's fundamental mission and of the library's place in society.

R. M. Braude\textsuperscript{55} (1994) proposed to join two disciplines medical librarianship and medical informatics to train medical staff and students.


D. McKenzie and V. Pifalo\textsuperscript{56} (1998) gave their personal views regarding the Medical Library Association Oral History Programme which uses accepted oral history techniques to collect and preserve interviews with members. The original taped interviews and transcripts were kept in the Medical Library Association archives and made available for research purposes; edited copies of the interviews were distributed through the National Network of Libraries of Medicine, and members were encouraged to borrow and read the histories. They provide summaries of forty-three interviews with views on health sciences librarianship and the Medical Library Association.

A. Davidson\textsuperscript{57} (1999) discussed the early days in medical librarianship. Medical librarianship has evolved from the need of doctors to have access to their professional literature. Since 1961 and the development of the postgraduate medical education movement within the National Health Service (NHS) there had also been an increasing trend to extend library services to other members of the healthcare team. Throughout, the emphasis had been to ensure that the professional providers of healthcare were well trained and well informed on medical and related matters. The 1980s was a decade of change in medical librarianship.

Prudence W. Dalrymple\textsuperscript{58} (2002) stated that the growth of the field of medical informatics, while seemingly a potential threat to medical librarianship, was in fact an opportunity for librarianship to both extend its reach and also to further define its unique characteristics in contrast to those of medical informatics. Furthermore,


because medical librarianship represents a sector of librarianship itself, the relationship between medical informatics and medical librarianship provided an example of the influence of a cognate field on the profession of librarianship that may extend across the profession. This paper defined medical informatics and librarianship, their areas of overlap and their claims to professionalism. The "informationist" a new health professional, which was recently proposed in one of the leading U.S. medical journals, illustrates one model of collaboration between the two fields. The paper concluded by suggesting new educational pathways.

B. S. Shearer, A. Seymour and C. Capitani59 (2002) introduced a series of articles examining the state of the medical library profession as practiced in the clinical context. It was widely understood that many changes across the spectrum of medical librarianship practice had been brought about by both technological advances and economic realities. These changes had created strains felt by many in the profession. Discussions of evolving roles for medical librarians that had gone on for years had taken on a new sense of urgency, not just because support of library services was at stake, but also because new opportunities, which many were eager to explore, await librarians. In June 2000, an editorial appearing in a mainstream medical journal proposed a reinvention of clinical librarianship that, if designed as presented in the editorial, would have a dramatic effect on current hospital-based library practice. This series of articles were developed in an effort to provide thoughtful consideration of the “informationist” model and to present new ways to look at the core competencies that define the profession.

J. Lyon\textsuperscript{60} (2003) described the impact of genetics and molecular biology on society and the practice of medicine. Medical librarians must prepare themselves to deal with this new arena of information. The Eskind Biomedical Library at Vanderbilt University Medical Center had developed a bioinformatics training programme for its librarians involving subject knowledge, literature evaluation, and database searching techniques. This programme could serve as a model for other libraries.

Pamela J. Sherwill-Navarro and Addajane L. Wallace\textsuperscript{61} (2004) did a study to evaluate the impact in the healthcare literature of research articles that provided evidence of the value of library services (including MEDLINE) as an element of quality healthcare. The results of this study demonstrated that published research on the value of medical library services had an impact on the literature. These articles were read and cited and continue to be of value.

Valerie Ferguson\textsuperscript{62} (2005) discussed about the professionalization of health librarianship with the focuses on the key role of the Library Association Medical Section in the professional development of medical librarians in the United Kingdom from 1909 to 1978 when it merged with the Library Association Hospital Libraries and Handicapped Readers Group to create the Medical, Health and Welfare Group. Uniting to form a stronger organization, under the ultimate designation of the Health Libraries Group, was part of an evolutionary process. The invention and promotion of co-operative schemes, networking and educational opportunities for members, the publication of specialized material and the fostering of international relationships


during the first three-quarters of the century were illuminated by personal reminiscences from some of the major participants in the field.

Gboyega Adio, A. Modupe Akewukereke and Samuel Olukayode Ibitoye (2007) discussed about the effect of medical libraries on medical education with special reference to Osun State, Nigeria. It explained vividly, the various constituents connected with value and effectiveness of information to medical practitioners, what to do and what doing them would mean in qualitative terms. In carrying out the research, a survey was conducted through the use of a self-developed 24-item questionnaire which tried to improve ways of accessing, assessing and communicating information effectively through strategic planning, statistical measurement, personnel appraisal and budgeting. The finding revealed that medical libraries were playing relevant and statutory roles in their various institutions. This was in spite of the fact that, the libraries were yet to be adequately equipped. At the end of the write-up, recommendations were made on how to improve the value of library services, increase efficiency and promote effectiveness.

M. K. Saimbert, Y. Zhang, J. Pierce, E. S. Moncrief, K. B. O'Hagan and P. Cole (2010) described Health information Systems (HIS). HIS had progressed from being used to manage billing to impacting patient safety and health professionals' job satisfaction. Many decisions were made during project management and the information system lifecycle of a HIS. Medical librarians were underutilized in HIS lifecycles; it might not be clear to stakeholders what they can provide and where their services fit. Medical librarians possess expertise to navigate various search resources

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and could investigate inquiries during information systems project lifecycles. Librarians could market specific skills to project lifecycle teams such as those involved in Computerized Provider Order Entry (CPOE), Electronic Medication Administration Record (eMAR) and Root Cause Analysis (RCA). HIS project personnel, including patient safety team members, should make use of medical librarians in phases of health information systems project management. This would help them to meet institutional and global objectives for evidence-based use of technology towards improved patient safety.

2.3 Hospital Librarianship

Marjorie Greenfield\(^65\) (1974) said that in health librarianship each librarian must search for that delicate balance between accessibility to the collection and availability of the collection, and this would be influenced by many factors, including the nature of the institution housing the library.

K. M. West\(^66\) (1975) argued that the quality of medical care was dependent on effective and expeditious information services for physicians and other health workers. Small hospitals had been at a particular disadvantage in this respect, mainly because unit costs of library services had been quite high when delivered on a small scale with traditional resources and methods. The importance of this problem was suggested by the fact that more than half of the US hospitals had less than 100 beds, and that library services had been primitive or nonexistent in most of these institutions. Certain developments at that time would permit most of these smaller hospitals to provide creditable information services at modest cost.


S. Hutchinson, J. Malamud, N. S. Stearns and B. Moulton\textsuperscript{67} (1981) described that health science librarians had been actively responding to the changing information needs of users by extending services which involve the selection of literature in response to specific requests from healthcare personnel. A further development was Patient Care Related Reading (PCRR), a hospital-based programme of continuing medical education in which the librarian actively participates in the pre-selection, packaging, and routine delivery of literature for use by physicians caring for patients with certain clinical disorders. Criteria for selection of literature packet topics were developed jointly by librarians and physicians at their own hospitals. Librarian's compiled bibliographic material, reviewed articles, and prepared preliminary packets. Physicians reviewed these packets and made suggestions for each article. Librarians then prepared final packets following reviewers' recommendations and distributed them as a routine procedure to all physicians caring for patients with a diagnosis corresponding to prepared topics. Librarians were notified of patients with PCRR clinical problems by admitting office personnel, floor nurses, nursing supervisors, utilization review, and Professional Standards Review Organization personnel as a part of their usual activities. Packets were used by physicians to add to their fund of knowledge, and for review and teaching purposes. PCRR had provided increased visibility of the library and its many services. Recognition of the librarian's role in the programme reinforces the concept of the community hospital library as a service-oriented entity, and helped to establish the library as an active partner in the development and implementation of hospital-based continuing education programmes.

A. A. White, M. E. Kolisch and M. E. McBride\textsuperscript{68} (1982) discussed about management of clinical information in orthopedics. Clinical research in orthopedics was especially dependent upon long-term patient studies. The meticulous, time consuming record keeping which such studies require was often prohibitive. Primarily to resolve this dilemma, but also to improve the organization and use of published biomedical literature in an academic, orthopedic department, a Clinical Information System was useful. The system was coordinated by a medical librarian with experience in information management. Computers were used to optimize the storage and retrieval of both patient generated data and biomedical publications data. Most significantly, the system allows for the orderly collection and storage of clinical data for prospective studies while minimizing the amount of time which the orthopedist must devote to such activities. The overall impact of a Clinical Information System was the spawning of a clinical environment which stresses the importance of documented evidence in patient care and which encourages participation in activities which produce such documentation.

In the year 1982, the results of a Canadian survey\textsuperscript{69} indicated that physicians in Ontario made little use of Libraries because they had no time to search for information beyond that they could obtain quickly from colleagues or from reference material in their own collections.

Jeanne M. Sarkis, Susan B. Vuturo and Stephen C. Hamburger\textsuperscript{70} (1983) studied the changes that have taken place in Current References, a specialized abstracting service at the University of Missouri-Kansas City School of Medicine. They concluded that


all parties involved in the change process have benefited. Librarians, students, docents, and administrators all participated in the decisions that led to the new format and emphasis. The decisions also significantly reduced costs; cut expenses, yet improved a service rather than eliminated it.

E. Garfield\textsuperscript{71} (1983) said that hospital is no more than a collection of beds in a building if it doesn’t have the basic services that define it as a hospital. There are certain facilities that can’t be optional - the medical library is one of them. He argued that we should continue to upgrade our medical facilities by utilizing the most modern and efficient methods and technologies.

D. N. King\textsuperscript{72} (1987) conducted a study in eight hospitals in the Chicago area as a quality assurance project. A total of 176 physicians, nurses, and other health professionals requested information from their hospital libraries related to a current case or clinical situation. They then assessed the quality of information received, its cognitive value, its contribution to patient care, and its impact on case management. Nearly two-thirds of the respondents asserted that they would definitely or probably handle their cases differently as a result of the information provided by the library. Almost all rated the libraries' performance and response highly.

B. L. Shipman, D. G. Schwartz and S. C. Dow\textsuperscript{73} (1992) mentioned in their paper that a number of previous studies have collected data on a hospital's use of databases and the librarian's role in the process. From a realistic perspective librarian mediated searching should be more efficient and cost effective than physician searching. In addition end users may ask the librarian to repeat a search, almost duplicating effort.


The advent of end-user searching has caused a re-examination of the role of clinical librarians, with more emphasis on instructional and consultative aspects.

Joanne G. Marshall\textsuperscript{74} (1992) identified that Hospital libraries face a particular challenge of economic constraint because the goals of the healthcare system demand that the relevance of library services to patient care be determined. The hospital librarians in Rochester, New York, responded to this challenge by developing a research project that explored the impact of library services on clinical decision making.

C. Tenopir and R. Neufang\textsuperscript{75} (1992) examined the need for patient-related information which might seem the primary motivation for end user searching in the hospital setting.

N. C. Broering and E. King\textsuperscript{76} (1993) described a document delivery library project which was designed to improve delivery of information to health professionals in the Washington DC/ Baltimore area. The project goals were to enhance delivery of full text documents and accelerate interlibrary loan services. The aim was to provide direct library services in the clinical arena by facilitating access to the articles needed by practitioners and clinical investigators. The objectives were to 1) design, develop and implement a comprehensive Document Delivery System (DDS) for the Library Information System which included interlibrary loan, photocopy services and facsimile transmission capabilities; 2) establish a multi-university library knowledge


network for resource sharing; and 3) evaluate the project. The DDS and facsimile service were described and project data and outcomes are reported.

N. W. Matheson\(^7\) (1995) pointed out that since the mid-1980s, end-user searching has been offered in hospital libraries. In a hospital information needs arise twenty-four hours a day, seven days a week. With the average length of stay in a hospital declining, information must be retrieved as soon as the need arises so as to influence clinical decision-making and treatment. As a consequence, hospital libraries are accessible twenty-four hours a day, providing physicians and others with immediate access to urgently needed patient care information.

C. J. Urquhart and J. B. Hepworth\(^8\) (1995) mentioned two reasons for end user searching – First, some patrons are simply looking for citations and second, some patrons have encountered problems using mediated search services such as turn around time, the time required to visit the library to initiate a search, poor quality of search results, and inconvenient location of the library.

C. J. Urquhart and J. B. Hepworth\(^9\) (1996) discussed the Value project, which assessed the value to clinical decision making of information supplied by NHS library and information services. The project not only showed how health libraries in the UK help clinicians in decision-making but also provided quality assurance guidelines for these libraries to help make their information services more effective. The paper reviewed methods and results used in previous studies of the value of health libraries, noting that methodological differences appear to affect the results. The paper also


discusses aspects of user involvement, categories of clinical decision-making, the value of information to present and future clinical decisions, and the combination of quantitative and qualitative assessments of value, as applied to the Value project and the studies reviewed. The Value project also demonstrated that the value placed on information depends in part on the career stage of the physician. This paper outlined the structure of the quality assurance tool kit, which was based on the findings and methods used in the Value project.

N. B. Giuse, S. R. Kafantaris and D. E. Giles\(^8^0\) (1997) argued that understanding of the desirable skills for health sciences librarians as a basis for developing a training programme model that reflects the fundamental changes in healthcare delivery and information technology. He concluded that health sciences librarian’s need a new educational model that provides them with broad-based tools to discover new roles and new resources for acquiring individual skills as the need arises. A unifying training model would involve trainees in developing their learning plan in a way that promotes proactive inquiry and self-directed learning, and it would rotate the trainees through projects to provide skills and an understanding of end-user work processes.

M. J. Teich\(^8^1\) (1998) found that the primary reason of a clear preference for hospital libraries (either medical school or medical society libraries where information was used for both clinical and research purposes) was that the library was the most important place of locating printed sources on which doctors still rely for browsing the literature.


N. B. Guise, S. R. Kafantaris, J. T. Huber, F. Lynch, M. Epelbaum, and J. Pfeiffer\textsuperscript{82} (1999) showed that between 1995 and 1996, the Annette and Irwin Eskind Biomedical Library at Vanderbilt University Medical Center (VUMC) radically revised the model of service it provides to the VUMC community. An in-depth training programme was developed for librarians, who began to migrate to clinical settings and establish clinical librarianship and information brokerage services beyond the library's walls. To ensure that excellent service would continue within the library, EBL's training programme was adapted for library assistants, providing them with access to information about a wide variety of work roles and processes over a four to eight-month training period. Concurrently, customer service areas were reorganized so that any question—whether reference or circulation—could be answered at any of four service points, eliminating the practice of passing customers from person to person between the reference and circulation desks. To provide an incentive for highly trained library assistants to remain at EBL, management and library assistants worked together to redesign the career pathway based on defined stages of achievement, self-directed participation in library-wide projects, and demonstrated commitment to lifelong learning. Education and training were the fundamental principles at the center of all this activity.

C. S. Scherrer and J. L. Dorsssch\textsuperscript{83} (1999) discussed a new role for the librarian who supported end user searching was network administration. Librarians were usually assisted by the hospital's information systems and data processing personnel. Besides creating new roles for the hospital librarian, end user search services could enhance


the library and its role within the hospital. The main question was, "who needs evidence based healthcare?"

P. O'Connor\textsuperscript{84} (2002) studied the impact of health library information in a number of settings and populations. This review examined both the methods employed and the outcomes reported in a series of impact studies conducted in four countries since the late 1980's. It demonstrated that health library information could affect patient care outcomes in various ways and had high cognitive and clinical value in diagnosing and treating patients. But there remains no agreed technique or methodology for determining the level of this impact. In many cases evaluation of the greater organization to which the library belongs. Consequently, local ad hoc evaluation was rarely reported outside an organization.

D. G. Wolf, C. C. Chastain-Warheit, S. Easterby-Gannett, M. C. Chayes and B. A. Long\textsuperscript{85} (2002) examined the developments in hospital librarianship in the United States, including the current status of hospital-based clinical library services. Several examples of hospital library services were presented that demonstrate some characteristics of struggling and thriving services. The implications of the informationist concept were considered. The continuation of the hospital librarian's primary role in support of patient care was explored, as core competencies were reexamined for relevancy in the new millennium.

Michael J. Schott\textsuperscript{86} (2002) described the role of hospital librarian on the bleeding edge of medicine. He argued to care secrets.

N. Bernal and J. Schneider\textsuperscript{87} (2002) argued that hospital librarians should adopt a proactive approach to the provision of knowledge-based resources and services. Librarians must position themselves to be highly visible within their organizations, with the goal of being viewed by top management as an indispensable component of the hospital's patient care, educational and research programmes. He proved that James A. Haley Veterans' Hospital Library Service had successfully adopted this approach.

Lorri Zipperer, Mary Gillaspy and Roxanne Goeltz\textsuperscript{88} (2005) portrayed that professionals working in healthcare whether physician, pharmacist, nurse, or librarian could be perceived as guests in the lives of patients can serve as a powerful philosophy when designing services for patients. Librarians in healthcare organizations could contribute to this patient-centered approach to care through a variety of relationships with the patient, the clinicians, and the organizations facilitating the care. A personal story of how sharing information in a guest/host fashion to improve care was provided. Examples of services that contributed to supporting this type of relationship at various stages of the care continuum had been reviewed. New ways of collaborating were presented to provide librarians with concrete ideas and examples of how to shift their effort and the work of their organization toward the quality aim of patient-centered care.

T. Knight and A. Brice\textsuperscript{89} (2006) said that hospital libraries were indicative of the ferment of change brought about by the digital revolution, and of the continuing determination of health information professionals to rise to the challenges involved in


supporting surgeons and everyone in the surgical team, as they endeavor to provide the best possible care for their patients. The authors discussed these changes and their implications for surgeons.

Cathy M. Perley, Camillia A. Gentry, A. Sue Fleming and Kristin M. Sen\textsuperscript{90} (2007) did research that sought to provide evidence to support the development of a long-term strategy for the Via Christi Regional Medical Center Libraries. The results of this three-part, user-centered information needs assessment were used to develop an evidence-based strategic plan. The findings confirmed the importance of promoting library services in the organization and suggested expanded, collaborative roles for hospital librarians.

M. Bandy, J. Condon, E. Graves\textsuperscript{91} (2008) argued about hospital librarians that they understand the need to move outside the four walls of the physical library and provide information support for clinicians in various settings. They should actively participate in quality improvement and patient safety committees in order to provide information to those groups. After review the authors found that some of these activities were done for a specific purpose and were short-lived. Other activities became institutionalized as the value of the librarian's contribution was recognized. This article has described examples in which hospital librarians were part of multidisciplinary teams created to improve patient care in their hospital.

Patricia L. Thibodeau and Carla J. Funk\textsuperscript{92} (2009) studied the status of hospital librarians and library services to better inform the Medical Library Association’s


advocacy activities. Hospital libraries and librarians continue to change in response to changes in the healthcare environment as healthcare administrators respond to financial pressures, library staff were downsized, degreed librarian positions were eliminated, and reporting structures change. Survey data support reported trends of consolidation of hospitals and hospital libraries and additions of new services. These services had likely required librarians to acquire new skills. It was hoped that future surveys will be undertaken to continue to study these trends.

Ruth Holst et al.\textsuperscript{93} (2009) described the current and future roles of hospital librarians and the challenges they face with the evidence supporting the hypothesis that librarians are essential to hospitals in achieving the organizations' mission-critical goals. They found that hospital librarians fulfilled many mission critical roles in hospital, providing the right information at the right time in a variety of ways to enhance hospital and medical staff effectiveness, optimize patient care, improve patient outcomes, and increase patient and family satisfaction with the hospital and its services. Because hospital librarians and their services provided an excellent return on investment for the hospital and help the hospital keep its competitive edge, hospital staff should have access to the services of a professional librarian.

P. Gardois et al.\textsuperscript{94} (2011) found that quantitative evidence of a significant difference in search performance between paediatric residents or interns assisted by a librarian and those searching the literature alone through a randomized controlled trial.


A. Burdick\textsuperscript{95} (2011) showed that e-mails from a clinical medical librarian integrated information education "sound bites" into clinical information and references provided to internal medicine teams. The e-mails followed adult education recommendations and physician preferences. Information education topics were short and directly applied to the clinical question discussed. Feedback has been positive and a small survey indicated that 79% of respondents learned more about Ovid MEDLINE and PubMed as information resources through clinical medical librarian e-mails and participation in patient care rounds. The sound bites project was well received and reinforced the value of information resources and of the librarian.

2.4 Evidence-based Librarianship

R. W. Wender, E. L. Fruehauf, M. S. Vent and G. D. Wilson\textsuperscript{96} (1977) argued that the continuing medical education was an area of concern to health sciences librarians. A comprehensive study of literature searches requested by physicians and by fourth-year medical students serving their five-week preceptorship with a rural physician was conducted: (1) to determine if there was any pattern to the requests received so that areas of study for continuing medical education could be ascertained; and (2) to determine whether there was any appreciable difference in nature and complexity between those searches requested by clinicians and those requested by medical student preceptors. Literature search requests were examined in terms of individual MeSH subjects, subcategories, and categories for each subject covered in every search. This analysis had demonstrated that assessing the clinical problems of

\textsuperscript{95} Burdick, A. (2011). Information "Sound Bites" by E-mail: Increasing Information Awareness and Improving Clinical Information Skills. \textit{Journal of Hospital Librarianship}, 11(1), 70-77.

practicing physicians may be one method of determining needed continuing medical education topics.

R. Helppie\textsuperscript{97} (1991) discussed that medical knowledge databases and datasets were increasingly available in electronic form, particularly on the World Wide Web. The premise of this medium was that it offers a \textit{"world of knowledge at your fingertips."} The reality however was somewhat different, as information systems were not well integrated into clinical practice, prove difficult to find specific information in, and contain content of varying quality. The continued evaluation of the medium in the future should be beneficial as evidence-based resources available and these resources are integrated into Electronic Medical Record Systems (EMRS).

Gordon Guyatt\textsuperscript{98} (1992) raised main issues in EBM through questions like –

- Where does the information come from?
- For whom is it intended and for what purpose?
  - patients, primary care or secondary care setting
  - funding decisions
  - policy making and management
- How is it processed, interpreted and applied?
- By whom it is processed?
  - Clinicians or other healthcare workers, managers, policy makers, librarians, statisticians

Sometimes the need is more complex and it is difficult to formulate the search question from the current clinical problem.


Frank Davidoff, Brian Haynes, Dave Sackett and Richard Smith\(^99\) (1995) discussed the background of EBM. According to the authors, EBM movement around the world had the potential at the beginning of the last decade of the twentieth century, to improve the quality of health information exchanged between countries. Historically, clinical epidemiology could be traced back to the dawn of medicine, since scientific evidence or information and the communication of such information had always been linked to practice, as had the conflicts between research and statistical results on the one hand and their application to medical practice on the other. EBM was first and foremost, a response to the tremendous expansion in size and scope of scientific information. This response takes the form of:

- Specialization and standardization of the form in which medical information is published
- Development of new tools for indexing, abstracting, and evaluating source materials
- Computerized clinical decision support systems and problem-based learning which integrate specialized up-to-date information in practice, applied to individual patients or groups.

W. M. Rosenberg and A. Donald\(^100\) (1995) clarified the concept of EBM as it attempts to fill the gap by helping doctors find the information that will ensure they can provide optimum management for their patients. In essence, EBM was rooted in two linked ideas:


- Firstly clinical decisions should be based on the best available scientific evidence
- Secondly the clinical problem should be found appropriate answers for different types of questions

D. L. Sackett, W. M. Rosenberg, J. A. Grey, and R. B. Haynes\textsuperscript{101} (1996) gave definition of Evidence-based Medicine (EBM) as the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of the individual patient by integrating individual clinical expertise with the best available external clinical evidence from systematic research. According to them, "As physicians, whether serving individual patients or populations, we always have to base our decisions and actions on the best possible evidence. The evidence gives the ability to establish the clinical bases for diagnosis, prognosis, and therapeutics. For its validity and usefulness, and incorporate this rapidly growing body of evidence into one's clinical practice has been named EBM. We see thus, that the focal point in the evolution of the concept of EBM is in fact, information."

J. Deeks and J. Glanville\textsuperscript{102} (1996) said that systematic reviews need to address the danger of understanding the literature evidence if it includes only that of a certain methodological quality. This would run the risk of missing the true message that the review was trying to identify. Indeed systematic review methodology was established, supported by General Guidance from the NHS Center for Reviews and Dissemination, and specific guidance from the Cochrane Review Groups. The Cochrane collaboration was a network of healthcare professionals, consumers, and researchers whose major


goals were to produce and distribute systematic reviews of the effects of healthcare interventions. The Cochrane Library Database of Systematic review was available online or on CD-ROM, and offers reference information. Linking evidence and clinical decisions, using RCT, epidemiological studies, expert opinion, and surveys of patient preferences should be the priority. Many doctors now recognize the need for reference information at the point of care. Doctors need clinical information to justify individual clinical decisions with explicit reference to evidence.

G. C. Michaud, J. L. McGowan, R. H. Vanderjagt, J. K. Dugan and P. Tugwell\(^\text{103}\) (1996) established that EBM is an increasingly important concept in continuing medical education. To cope with the rapid evolution of medicine, physicians need to remain abreast of the many new therapies and diagnostic tools that affect their practices. A study was conducted to investigate the level and type of information required by these individuals in a clinical setting. A literature searching service was introduced six months after the formal introduction of evidence-based medicine in the Department of Medicine.

D. C. Slawson and A. F. Shaughnessy\(^\text{104}\) (1997) revealed that all these concepts of "what is and what isn't EBM, from the pen of its founders have been expressed slightly differently in an approach rejoicing in the catchy acronym POEM, standing for patient oriented evidence that matters." This concentrates slightly more narrowly on the importance of the evidence to the patient, with the question: does the information focus on an outcome that my patients care about? Clearly, EBM should apply to decisions that have to be made for population, as well as for individual patient e.g.


public health decisions, preventive medicine, screening purchasing. All of these involve resource to different types of values from those exercised in the doctor-patient relationship, although these decisions undoubtedly affect the care of patients.

J. A. Muir Gray\textsuperscript{105} (1997) mentioned that clinical effectiveness should be measured by the extent to which different interventions achieve the intended outcome. The most objective method for establishing best medical practice was the randomized controlled trial (RCT). The RCT was regarded as a 'gold standard' for effectiveness studies owing to its lack of systematic bias. The RCT was the most proper technique of wide applicability, but as with everything else there were difficulties. Although the RCT was the best way of evaluating the effectiveness of an intervention, a different set of problems arise when treatment was on urgent matter.

J. A. Regan\textsuperscript{106} (1998) stated that evidence might come from research, audit, feedback from clients, and expertise. Doctors should use both individual clinical expertise and the best available external evidence for the practice professional, providing care to patients for which there is evidence of clinical effectiveness, it may come as "doing the right thing in the right way for the right patient at the right time."

K. A. Mckibbon\textsuperscript{107} (1998) gave an overview of evidence-based practice (EBP) as it was spreading in many healthcare disciplines with the features of reliance on the partnership among hard scientific evidence, clinical expertise, and individual patients’ needs and choices. Librarians played an important role in the spread of EBP because of the importance of identifying and retrieving appropriate literature from various


sources for use in making healthcare decisions. The authors talked about how to search for therapy, diagnosis, etiology and prognosis both for original studies and secondary publications such as systematic reviews, meta-analyses and clinical practice guidelines. Understanding how this research was done, how it was indexed, and how to retrieve the clinical evidence were an important set of skills that librarians could provide for clinicians interested in EBP.

M. Earl and J. A. Neutens\(^{108}\) (1999) pointed out that several studies express common themes and suggest activities for librarians wishing to promote the use of new technologies. Health sciences librarians have been advocating the use of indexes and abstracts for as long as these products have been available for EBM practice.

T. Pyne, K. Newman, S. Leigh, A. N. Cowling, and K. Rounce\(^{109}\) (1999) reported on clinicians’ use of library resources and the competencies they require to access information necessary for the practice of evidence-based healthcare. It was based on the results of a study commissioned by North Thames Region to identify the training needs of clinicians for the adoption and practice of evidence-based healthcare. Participants in this qualitative research study included librarians, clinicians (doctors, nurses etc.) and managers from four Acute and Community Trusts in and around London. The research indicates that the majority of clinicians recognize the need to keep up-to-date with changes in their specialty and many visit their libraries on a frequent basis, however, few appear to be searching for information with which to inform their immediate clinical decisions. The sample acknowledged their low usage of journals such as Bandolier, the Health Effectiveness Bulletin and Journal of


Evidence-Based Medicine. Similarly, low use of electronic databases, such as Cochrane and Cinahl, were reported. Examination of skill and self-efficacy levels in accessing and using information databases revealed wide variations across professions, specialities and Trusts. Qualitative research methods were employed to elicit the key competencies required to access clinically relevant research evidence, and a framework for integrating these competencies was presented.

B. Rowe\textsuperscript{110} (1999) stated that librarians had been involved in promoting EBM approaches in many settings, the best known of which was probably the Cochrane Collaboration, which exemplifies in depth and systematic collective information and could be targeted at a specific, perhaps immediate need. The worth of the Cochrane Collaboration, for example, depends on people who have a good appreciation of the clinical area plus information retrieval skills. Unfortunately, they may not have specialist clinical skills plus an appreciation of information on health informatics.

E. A. Holtum\textsuperscript{111} (1999) explored the issues related to the complexity of bibliographic retrieval in the networked environment within the context of evidence-based medicine and the division of labor.

S. E. Strauss and F. A. McAlister\textsuperscript{112} (2000) discussed about evidence-based medicine engender both negative and positive reactions from clinicians and academics. Ways to achieve evidence-based practice were reviewed and the most common criticisms described. Potential solutions to the true limitations of evidence-based medicine were also discussed and areas for future work highlighted.


T. Radar and A. J. Gagnon\textsuperscript{113} (2000) described barriers to evidence-based practice and outline the committee's strategies for overcoming these barriers, including the development and promotion of a Web-based guide to evidence-based practice specifically designed for clinicians (health professionals) at a hospital. Educational strategies for use of the Web-based guide have also been addressed. Advantages of this partnership were that the skills of librarians in meeting the needs of clinicians were maximized. The evidence-based practice skills of clinicians were honed and librarians made a valuable contribution to the knowledgebase of the clinical staff. The knowledge acquired through the partnership by both clinicians and librarians would increase the sophistication of the dialogue between the two groups and in turn it would expedite the transfer of evidence into practice.

J. D. Eldredge\textsuperscript{114} (2000) discussed the challenges of finding evidence needed to implement Evidence-Based Librarianship (EBL). Focusing first on database coverage for three health sciences librarianship journals, the article examined the information contents of different databases. Strategies were needed to search for relevant evidence in the library literature via these databases, and the problems associated with searching the grey literature of librarianship. Database coverage, plausible search strategies, and the grey literature of library science all posed challenges to finding the needed research evidence for practicing EBL. Health sciences librarians need to ensure that systems were designed that could track and provide access to needed research evidence to support EBL.


J. D. Eldredge\textsuperscript{115} (2000) demonstrated how the core characteristics of both evidence-based medicine (EBM) and evidence-based healthcare (EBHC) could be adapted to health sciences librarianship. Evidence-based librarianship offers a decision making framework, which integrates the best available research evidence. By employing this framework and the higher levels of research evidence it promotes, health sciences librarians could lay the foundation for more collaborative and scientific endeavors. The increasing emphasis of EBM called for the integration of clinical expertise with the best available external evidence. The evidence sought, the randomized controlled trials being the ‘gold standard’ for therapeutic evidence, should be rapidly retrieved and directly relevant to the clinical problem. Getting research into the practice was not a straightforward exercise and as usual with research, a number of questions are raised:

- Can EBM work in practice?
- Does information make the difference?

W. Jedrychowski, U. Maugeri and I. Jedrychowska-Bianchi\textsuperscript{116} (2001) mentioned that EBM was not self-evidently practiced, as witnessed by the striking variations in clinical behavior in different centers, even within one country. It was not a ‘cost-cutter’ as the most efficacious interventions for individual patients may increase rather than lower cost.

G. Ikkos, L. Rigby and Gill Terry \textsuperscript{117} (2001) described a project at the postgraduate centre at Edgware Community Hospital in which 1.6 full-time-equivalent clinical


Librarians have been employed to support and develop life-long learning and evidence-based clinical practice in the workplace. The aim was to identify the information needs of staff and deliver it to them in convenient settings.

A. Booth (2002) said that an important observation within the context of evidence-based practice relates to the characteristics of librarianship as a profession. It was unlikely that evidence for training programmes, service delivery, management of services and staff with marketing and publicity would be located within our professional literature alone.

Ellen Crumley and Denise Koufogiannakis (2002) pointed out a practical framework for the implementation of EBL. A new way of thinking about research in librarianship was introduced using the well-built question process and the assignment of librarian research questions to one of six domains specific to librarianship. As a profession, librarianship tends to reflect more qualitative, social sciences / humanities in its research methods and study types which tend to be less rigorous and more prone to bias. Randomized controlled trials (RCT) did not have to be placed at the top of an evidence ‘hierarchy’ for librarianship. Instead, a more encompassing model reflecting librarianship as a whole and the kind of research likely to be done by librarians was proposed. ‘Evidence’ from a number of disciplines including health sciences, business and education can be utilized by librarians and applied to their practice. However, access to and availability of librarianship literature needs to be further studied. While using other disciplines (e.g. EBHC) as a model for EBL had been explored in the literature, the authors developed models unique to librarianship. While research had always been a minor focus in the profession, moving research into practice was

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becoming more important and librarians need to consider the issues surrounding research in order to move EBL forward.

A. Booth\textsuperscript{120} (2002) discussed about the strengths and weakness of evidence-based practice within UK. The author also described the contribution of UK to the development of technical skills in systematic reviews and critical appraisal of the health information literature.

K. K. Grandage, D. C. Slawson and A. F. Shaughnessy\textsuperscript{121} (2002) described about the information needs of practicing clinicians which were distinct from the needs of students, researchers, or non-clinical personnel. Clinicians seek information to stay current with new relevant medical developments and to find answers to patient-specific questions. The volume of available information makes clinicians' tasks of rapidly identifying high-quality studies daunting. New tools evaluate the rigor and relevance of information and summarize it in the form of synthesized clinical answers. These sources had the opposite focus of many other information tools in that they strive to provide less information rather than more. With the development of these sources of validated and refined information, a new search approach was needed to locate clinical information in which speed was the benchmark. The existing medical literature, including these new refinement tools, could be conceptualized as a pyramid, with the most useful information, based on validity and relevance, placed at the apex. Use of this hierarchy allows searchers to drill down through progressive layers until they find their answers. Librarians can play a significant role in evaluating


the ever-increasing variety of these synthesized resources, placing them into the searching hierarchy, and training clinicians to search from the top down.

J. D. Eldredge\textsuperscript{122} (2002) did a study to predict the possible accomplishments of the Evidence-Based Librarianship (EBL) movement by the years 2005, 2010, 2015 and 2020. According to the author by 2020, EBL would have become indistinguishable from mainstream health sciences librarianship/informatics practices.

A. Booth\textsuperscript{123} (2003) reviewed the role of evidence-based librarianship as a bridge between research and practice gap. The review started by charting the development of evidence-based practice from its origins in medicine through healthcare to other disciplines. It then examined the context for the development of EBL focusing on examples from the wider library literature and on the health information literature from 2002 onwards. The review examined each stage of evidence-based practice process and the legacy from the wider paradigm as it specifically relates to information practice. Tools and methods developed within evidence-based information practice were briefly summarized. The review concluded by outlining the challenges that remain if evidence-based information practice is to be adopted within the profession at large.

A. Booth\textsuperscript{124} (2003) mentioned that in seeking to bring the most relevant, highest quality evidence to bear in making practical decisions within healthcare field, it was fitting that EBL should reflect the different environments and, indeed, countries where librarians face distinct challenges.

Denise Koufogiannakis, Marlene Dorgan and Ellen Crumley\textsuperscript{125} (2003) described how EBL facilitate in the University of Alberta, Canada. Liz Doney and Wendy Stanton\textsuperscript{126} (2003) described how EBL facilitate in the School of Health and Related Research (ScHARR) in Sheffield. M. C. Atlas, E. M. Smigielski, J. L. Wulff and M. T. Coleman\textsuperscript{127} (2003) discussed case studies from morning report. In primary care specialties, morning report is a traditional vehicle for expanding medical residents' training in diagnosis and treatment. At one academic medical center, residents and faculty in the Department of Family and Community Medicine use case-based teaching, centered on planning and reviewing patient management, to review intriguing cases from patient encounters in the department's hospital service. Seeking to improve the level of evidence-based information exchanged at morning report, department leaders invited reference librarians from the health sciences library to attend weekly morning report. The librarians saw this as an opportunity not only to improve residents' information-seeking skills, but also to improve librarians' teaching skills and understanding of the needs of users in clinical settings. This paper described the evolution of librarians' involvement in morning report, examples of the kinds of contributions librarians had made in this setting, and changes made in morning report sessions to facilitate this activity.


N. Deshpande, M. Publicover, H. Gee and K. Khan\textsuperscript{128} (2003) examined implementation of evidence-supported delivery suite ward rounds using strategies to overcome barriers. It has been found that clinicians had limited awareness about the potential benefits of a clinical librarian’s support during ward rounds. They were unsure of their skills in evidence-based practice. There was skepticism, fear of loss of autonomy, poor motivation and resistance to change. Clinicians identified several factors that could impinge on their practice. Using appropriate strategies when evidence-supported ward rounds were conducted, 67 questions were raised. However, only seven articles were appraised in time to affect decisions on that ward round. Knowledge of barriers was helpful in developing plans for implementation of evidence-supported ward rounds.

Arri Coomarasamy and Khalid S. Khan\textsuperscript{129} (2004) did a systematic review to evaluate the effects of standalone versus clinically integrated teaching in evidence based medicine on various outcomes in postgraduates. It has been found that standalone teaching improved knowledge but not skills, attitudes, or behavior.

Taneya Y. Koonce, Nunzia Bettinsoli Giuse and Pauline Todd\textsuperscript{130} (2004) investigated the effectiveness of EBM resources in providing evidence for complex clinical questions versus general care management questions to identify situations for their optimal use. An evidence-based culture could provide the opportunity for libraries to become Centers of Evidence and librarians to play a new, high profile, pro-active role.


as educators and facilitators. With the time of outgoing healthcare changes, consumers need to become better informed to actively participate in their healthcare decisions. An intelligent information filtering system assists users in being notified of updates to new and relevant information. The pervasive use of EBM resources in answering clinical questions was making it imperative for information specialists to develop an expertise on their appropriate use. By exploring their use in answering complex clinical questions and general care management questions, this paper underlined the strengths and weakness of EBM resources and provides information specialists with some basic knowledge about how these resources can be combined with the primary literature to strengthen their effectiveness.

A. L. Weightman and J. Williamson131 (2005) discussed about how was research information stored and retrieved in the medical literature? Many data sets were now being defined to analyze healthcare. Data sets were not new to the healthcare industry but new needs have created needs for access to clinical data, outcome analysis, quality assessment, or other health benefits. Clinical data includes many electronic patient data systems, for example, laboratory systems, pharmacy systems, and analytic databases. Typically all carry variables of interest, for example the most recent hemoglobin value, whether the patient was anemic, and the number of units of blood transfused (one record per observation). They were in contrast to bibliographic databases, e.g. MEDLINE, DIMDI, BIOSIS, COCHRANE, which record the published existence of journal articles, research reports, and monographs. There were problems for clinicians in relating the research data to questions about inadequate patient care.

S.T. Rosenbloom, N. B. Giuse, R. N. Jerome and J. U. Blackford\textsuperscript{132} (2005) compared informationists and two categories of physicians in their article selection in response to two complex clinical questions. In general, both informationists and physicians trained in research methodology had a high degree of inter group agreement for ranking article pertinence, while the generalists were less likely to agree on pertinent articles. These findings suggested that informationists consistently select articles relevant to answering complex clinical queries and may assist practicing clinicians by providing information relevant to patient cases.

G. J. Perry and M. R. Kronenfeld\textsuperscript{133} (2005) discussed about the paradigm shift in the health science librarianship. A shift to an EBP model, featuring a new medical knowledge base infrastructure facilitating rapid translation of clinical research into practice should be embraced. This shift would offer new opportunities for health sciences librarians. In this article, the authors: (1) reviewed milestones in the evolution of the health sciences knowledge base; (2) reviewed the evolution of the Evidence- Based Healthcare/Practice model of health information utilization; and (3) discussed the significance and implications for health sciences librarians of trends towards an increasingly digital health information environment. The authors suggested new roles for health sciences librarians including partnering to integrate advanced information management technologies into the clinical enterprise and integration into the processes for developing these technologies.


Heather Morrison\textsuperscript{134} (2006) said that Open Access and evidence-based librarianship are a natural combination.

Mary Publicover, G. Giles, B. Bolton, C. Shemilt and C. Urquhart\textsuperscript{135} (2006) pointed out that at a time of rapid change, librarians need to develop reflective listening techniques to keep pace with the actual needs of their users. The authors warned that library staff should never assume that clinical staffs were aware of the services that the library offers.

Nicola Pearce-Smith\textsuperscript{136} (2006) did a case study to establish a journal club for librarians, which aimed to develop appraisal skills and assist in the application of research to practice. It has been found that journal clubs could be effective at developing appraisal skills and writing a critically appraised topic, as well as increasing the reading of library research. Librarians still need assistance in identifying and using questions directly from their own practice. The journal club had helped some librarians to apply evidence to practice, but others find the research was not always directly relevant.

Alan Schwartz and Gregory Millam\textsuperscript{137} (2006) revealed that a web-based EBM library consult model may provide a useful way for informationists to assist clinicians, and were feasible to implement.

Lisa Given\textsuperscript{138} (2007) discussed the importance of qualitative research in evidence-based library and information practice (EBLIP), with a focus on practical tips for

\textsuperscript{138} Given, L. (2007). Evidence-Based Practice and Qualitative Research: A Primer for Library and Information Professionals. Evidence Based Library and Information Practice, 2(1), 15-22.
evaluating and implementing effective qualitative research projects. The paper provided a brief introduction to the nature of qualitative inquiry and its status within current models of evidence assessment. Three problems of excluding qualitative research from the evidence-base in library and information studies (LIS) were identified: 1) ignoring the social sciences and humanities traditions that inform research in the field; 2) privileging of quantitative and experimental methods over others in evidence assessment; and, 3) focusing attention away from the best evidence for LIS research problems.

Michael Kronenfeld et al.\textsuperscript{139} (2007) provided an overview of the state of evidence-based practice (EBP) in nursing and selected allied health professions and a synopsis of current trends in incorporating EBP into clinical education and practice in these fields. This overview was intended to better equip librarians with a general understanding of the fields and relevant information resources.

In the year 2007, policy statement of the Medical Library Association (MLA)\textsuperscript{140} takes the position that scientific evidence is the basis for improving the quality of information sciences now and in the future. "The health information professional not only provides specific support to the institution by using new technologies to organize, synthesize, and filter information for scholarly, clinical, and institutional decision making, but also plays a critical role in the investigation and study of information storage, organization, use, and application in education, patient care, and generation of new knowledge." Over a similar time period the quality movement, with its increasing demand for the collection and use of data, had been growing.


Developments such as total quality management and continuous quality improvement reinforce the centrality of research and its relationship to efficient and effective information practice.

S. A. Mulvaney, L. Bickman, N. B. Giuse, E. W. Lambert, N. A. Sathe, and R. N. Jerome\textsuperscript{141} (2008) pointed out the different techniques (RCT, Meta Analysis, Consensus) had different purposes and were useful in different ways, from sciences through decision to practice. These should be appropriately to inform clinical judgment. The importance of an evidence base for health promotion was recognized. Also much research was not well designed. Healthcare providers need to make best use of the available evidence.

Kathleen Burr Oliver, Harold P. Lehmann and Karen A. Robinson\textsuperscript{142} (2008) mentioned that a group of interdisciplinary faculty at Johns Hopkins had developed and offered a course for informationists that represent a novel approach to teaching skills important to the transfer of evidence into practice. This successful first experience with a small group of informationist fellows suggested that a course of this type has the potential to serve as a scaleable model for training adequate numbers of these new information professionals. The authors believed that a major advantage of this interdisciplinary approach to teaching informationist skills lied in the ease with which this model could be replicated at other academic medical institutions, which were likely to have faculty with a similar range of necessary expertise.


Vahideh Zarea Gavgani and Vangari Vishwa Mohan\textsuperscript{143} (2008) did one user study to explore physicians’ attitudes towards Evidence-Based Medical Practice (EBMP), their awareness and practical knowledge in finding and evaluating evidence/information, and the implication of these findings for health science library services. This study concluded that efficient librarian information support services should be provided to physicians in order to enable them to practice evidence-based medicine.

Rex R. Robison and Mary E. Ryan\textsuperscript{144} (2009) wanted to explore the impact of an informationist programme at the National Institutes of Health (NIH) Library and to provide a basis for further programme assessment. In 2001 the NIH Library began its informationist programme, where librarians with training in both biomedicine and information science work alongside researchers. The goal of the programme was to facilitate researchers’ access to and usage of information resources. It has been found that Informationists saved researchers time by obtaining requested information, finding esoteric or unfamiliar resources, and providing related training. These activities appeared to be facilitated by the acceptance of the informationist as part of the research team. This exploratory study provided background that should be useful in future, more extensive evaluations.

S. Ayre and G. Walters\textsuperscript{145} (2009) studied to determine whether inpatients in a medical admissions unit in a UK district general hospital received evidence-based therapies in 2008. It has been found that one hundred and two patients generated 150 diagnosis-therapy pairs. Of these 61 (41\%) had systematic review level evidence supporting


\textsuperscript{144} Robison, R. R., & Ryan, M. E. (2009). Inquiring Informationists: A Qualitative Exploration of Our Role. \textit{Evidence Based Library and Information Practice, 4}(1), 4-16.

\textsuperscript{145} Ayre, S., & Walters, G. (2009). Are therapeutic decisions made on the medical admissions unit any more evidence-based than they used to be?. \textit{Journal of Evaluation in Clinical Practice, 15}(6), 1180-1186.
them, 17 (11%) randomized controlled trial evidence, 48 (32%) non-experimental evidence and 24 (16%) no evidence.

P. Li and L. Wu\textsuperscript{146} (2011) sought to identify medical librarians' roles in supporting evidence-based medicine (EBM) practice; determine whether medical librarians' work settings, work experiences, or job titles made a difference in their EBM responsibilities; and find out medical librarians' perceptions of their roles in EBM practice. An online survey was distributed to U.S. medical librarians. The results showed that medical librarians had positive perceptions of their EBM-related responsibilities, which were diverse and specific. Their work experience, work settings, and job title categories related to some of their EBM responsibilities, as well as the nature of some of the responsibilities.

A. Burdick\textsuperscript{147} (2011) considered the legitimate peripheral participation model in developing professional competencies in health librarianship. It also described how this model was used in the development of a framework for mapping and recognizing the competencies gained by new health librarians at the Royal Free Hospital Medical Library.

C. Arguelles\textsuperscript{148} (2011) described \textit{Evidence-Based Mentors}, an integrated strategy with librarian participation, aimed to motivate and assist nurses in the search and use of literature and evidence-based information for nursing practice in a teaching hospital. The librarian's role goes beyond searching the literature to involvement in teaching critical appraisal of information. The author gave details of the evidence-based process, including the categorization of resources, and the synthesizing that lead to the


\textsuperscript{147} Burdick, A. (2011). Information "Sound Bites" by E-mail: Increasing Information Awareness and Improving Clinical Information Skills. \textit{Journal of Hospital Librarianship}, 11(1), 70-77.

change of nursing practices that impact on outcomes directly related to patient recovery, organizational effectiveness, and nursing competency.

Jonathan D. Eldredge\textsuperscript{149} (2012) described the evolution of Evidence-Based Library and Information Practice (EBLIP). EBLIP had managed rapid pace due to a professional environment characterized by encouragement, inquiry, skepticism, dialogue, openness to new information among participants, and a willingness on the part of LIS professionals to change their own minds.

\section*{2.5 Clinical Librarianship}

\subsection*{2.5.1 History of Clinical Librarianship}

The concept of clinical librarianship, first introduced by Lamb\textsuperscript{150} (1984) at the University of Missouri-Kansas City Medical Library was described at the 1973 MLA annual meeting, giving the new face to the medical libraries "\textit{we take the library to the user out of the walls.}" Lamp established the first clinical-medical librarian programme at the University of Missouri-Kansas.

V. Algermissen\textsuperscript{151} (1976) mentioned a letter to the editor that the Clinical Medical Librarians in have been active for nearly four years.

J. W. Yeoh\textsuperscript{152} (1976) wrote a letter to the editor letter discussing implementation of a new clinical medical librarian programme was confined to a hospital situation only—employing one professional librarian and not connected with a medical school, whereas the programmes mentioned in Ms Algermissen's letter were conducted by large medical libraries employing several specialized medical librarians. The two

\textsuperscript{149} Eldredge, J. D. (2012). The Evolution of Evidence Based Library and Information Practice, Part I: Defining EBLIP. \textit{Evidence Based Library and Information Practice}, 7(4), 139-145.


working situations were quite different. The purpose of her letter was to point out that it would be feasible for hospital librarians to manage their time in such a way as to offer this service part-time to their medical staff.

Polly Cummings\textsuperscript{153} (1976) showed that as a result of Lamp's pioneering efforts, many clinical-medical librarian programmes, initially supported by grand funding from the National Library of Medicine (NLM), were started during the next decades. Four programmes had been created by 1974, 23 programmes by 1985, and 29 programmes were reported in the literature by 1993. Several valuable reviews of Clinical Librarianship are available, with the most comprehensive bibliography from the middle of 1970 to middle of 1980.

V. Algermissen\textsuperscript{154} (1976) mentioned the history and described the operations of the University of Missouri-Kansas City Medical Library, established in 1967, with an outline of its growth and current functions as part of the university's medical college.

Lisa Comelisse\textsuperscript{155} (1978) described about the clinical reference programme in the department of Medicine of Tufts-New England Medical Center Hospital. The librarian subjectively had seen a gradually increasing usage and acceptance of the materials and services provided by the programme. Almost all users and members of the department who were aware of the programme had expressed pleasure, satisfaction, and confidence in the programme and its goals. Problems encountered include publicizing the existence of the programme and loss of core materials.

A previous article by Claman156 (1978) attempted to answer the question "what do these medical-clinical librarians do, and why?" Even though they were basically reference librarians in a medical school-hospital setting, there were two differences between traditional library-based reference work and the work of the CML:

- CML takes the library to the user
- CML often provide information before they have asked for it.

Sandra R. Clevesy157(1980) mentioned that at the smaller teaching hospital with only one professional librarian, providing CML services to one department is difficult to justify because of the disproportionate time committed to the information needs of a small select group. She wanted modified CML programme as a valid approach to facilitate the information transfer essential to the provision of quality medical care.

N. L. Ekstrand, C. D. Maynar and M. D. Sprinkle158 (1983) described that in order to simplify access to the medical radiology literature; a clinical information service was created within an academic radiology department. The programme, administered by a clinical medical librarian, provided literature search services and current literature selection for in-house faculty and staff members to answer questions related to patient management, research, publication, and conference preparation. Additional services are provided through selective bibliographies and "current awareness" searches, both updated frequently, and a monthly journal table-of-contents packet in the areas of radiologic diagnosis/nuclear medicine and radiation therapy. The clinical medical librarian also administered a departmental learning resource center and teaching files.

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Development of a subscription information service for practicing radiologists was also discussed.

Barbara Halbrook\textsuperscript{159} (1983) discussed successes and failures of clinical librarian programmes.

Richard Hayden\textsuperscript{160} (1983) described a clinical librarian programme for oncology nursing at Roswell Park Memorial Institute.

L. Landau\textsuperscript{161} (1984) pointed out the evolution of a clinical librarian programme. According to him the role of a clinical librarian is multi-faceted and dependant on the depth of integration achieved within the targeted area. The skills acquired by a clinical librarian are not unique to working with clinical staff, as they are transferable to any outreach service provision.

S. K. Millard\textsuperscript{162} (1984) described a clinical librarian programme for dental faculty. According to the author, for dentists the term clinical information encompasses not only the information in the biomedical literature but also the information derived from the patient. Gains in clinical knowledge come both from consideration of the literature, which will largely represent the views of other clinicians or the consensus view of a group of clinicians, and also from personal experience gained in direct clinical care.

R. C. Tobia\textsuperscript{163} (1984) pointed out clinical librarianship at the University of Texas Health Science Center at San Antonio Library.


\textsuperscript{163} Tobia, R. C. (1984). Clinical librarianship at the University of Texas Health Science Center at San Antonio Library. Clinical Librarian Quarterly, 3(1-2), 1-4.
Jean E. Crampon\textsuperscript{164} (1985) wrote a letter to the editor to describe a clinical medical librarian programme at SIU School of Medicine.

Cimpl\textsuperscript{165} (1985) illustrated the nature of the partnership required for programmes, as well as the strategy of the library community to gain visibility for Clinical Librarianship. The evolution of the clinical librarian, as documented by Cimpl, defined as a primary role of the hospital librarian as one of immediate responses to information requests related to patient care. In addition Cimpl summarized the reasons clinical library services were offered, "to provide information quickly to physicians and other members of the healthcare team; to influence the information seeking behavior of clinicians and to improve their library skills; and to establish the medical librarian's role as a valid member of the healthcare team."

Barbara Cohen and John A. Timour\textsuperscript{166} (1985) mentioned a clinical programme for in-service nurses in the 619-bed Thomas Jefferson University Hospital in Philadelphia, Pennsylvania.

E. B. Horak\textsuperscript{167} (1987) mentioned that in their new role as information consultants and educators, clinical librarians, librarians were at the same time encouraging users to be skillful information managers. As a reflection of this trend, the term 'user' had largely replaced the more passive word 'patron' in the years since the inception of clinical librarianship.

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J. Lockyer, P. Jannett, J. Parboosingh and W. Maes\textsuperscript{168} (1988) made a study to examine the number of questions that arose one day to which family physicians did not have an answer, the library resources to which the family physicians had access and used, and the relationship between the number of questions that arose in practice and library resources or use. When accessing libraries, physicians relied primarily on their office and home libraries. Personal libraries had fewer than ten textbooks published since 1980 and subscriptions to fewer than five journals. T-test analysis indicated that the physician with the most questions practiced in the medical school community, was a graduate of a Canadian or United States medical school, and attended a course on problem raising and solving. The number of questions did not differ by the holdings in the physician's library, the age or sex profile of the patients, the number of patients seen or the frequency with which the physician used his personal library. Medical educators and librarians should provide educational opportunities to assist family physicians develop their personal libraries, their problem solving skills and their use of modern technology to access the literature.

D. D. Halsted and D. H. Ward\textsuperscript{169} (1989) pointed out that the existence of CML programmes teaching computerized searching and bibliographic skills can make it possible for librarians to expand existing programmes and enhance the role of the CML by adding a variety of educational experiences to CML services and creating a more worthwhile relationship with the clinical staff. The expanding role of end user searching and the ongoing use of librarian mediated searching indicated that there is a place for each type of searching within the hospital library.


Jeanne M. Sarkis and Ruth M. Shipley\textsuperscript{170} (1990) found that Clinical Medical Librarian services could be extended to any number of departments and could include wide ranges of activities. They also found that increased funding does not necessarily follow the "enhancement" of services. It was possible for CMLs to assume excessive responsibilities for which there might be no professional or financial reward. In the academic setting, librarians were often expected to conduct research, publish, and participate in committee work.

Makowski\textsuperscript{171} (1994) covered the literature in the decade after Cimpl's review to discuss potential roles for the clinical librarian. The theme was similar to that of earlier work:

- CML takes the library to the user either on the hospital ward, in the outpatient clinic, and in the medical School teaching areas.

Nunzia Bettinsoli Giuse\textsuperscript{172} (1997) pointed out that as part of their effort to assimilate the culture, clinical librarians should seek instruction in the techniques of clinical trials, including randomization and blinding techniques; they should study the tenets of evidence-based medicine; they should consult with subject experts and clinicians who can evaluate and support their filtering and interpretation skills; and they should take clinical courses in the medical and nursing schools. Librarians had to migrate into the clinical setting and to avoid doing that was likely to deny their future in the information age.


Nunzia Bettinsoli Giuse et al.\textsuperscript{173} (1998) described the CML programme at Vanderbilt University Medical Center (VUMC) which promotes the true integration of librarians into clinical teams. To capture the expertise, time, and effort librarians put into answering each clinical question received on rounds, VUMC's CML programme incorporates the ongoing creation of a searchable electronic database of clinical questions. Librarians enter each of their clinical questions, references, and filtered summaries into a relational database. The authors also found that clinical medical librarianship was labor intensive and expensive.

Carole M. Gilbert\textsuperscript{174} (1999) described an adaptation to a clinical librarianship programme. According to the author the programme can be initiated by any medical librarian regardless of the size of the library staff or the hospital. It takes a minimal commitment of time and resources and could be adapted to hospitals that do not have residency programmes. It is an effective way for librarians to become more involved in the continuing education of medical staff, nurses, and allied health personnel.

S. S. Fuller, D. S. Ketchell, P. Taczy-Hornoch and D. Masuda\textsuperscript{175} (1999) mentioned that the health sciences librarians at the University of Washington (UW) were partners in the evolution of Internet-based clinical information systems for two medical centers, University of Washington Medical Center and Harborview Medical Center, as well as the UW Primary Care Network clinics. Librarians lead information resource and systems development projects and played a variety of roles including facilitator, publisher, integrator, and educator. These efforts had been coordinated

with parallel development efforts by the Integrated Advanced Information Management Systems (IAIMS) clinical informatics group in developing electronic medical record systems and clinical decision support tools. The outcome was MINDscape, a very heavily used web view of the patient medical record with tightly integrated knowledge resources as well as numerous web accessible information resources and tools. The goal of this article was to provide a case study of librarian involvement in institutional information systems development at UW and to illustrate the variety of roles that librarians can assume in hospital settings.

Carolyn E. Lipscomb176 (2000) discussed the definition, role, concept, environmental influences and importance of clinical librarianship with historical viewpoint. According to author clinical librarianship had perhaps been one of the most innovative concepts to be introduced into health sciences libraries. The ideas behind it continue to inspire health sciences librarians and to guide priorities. It moves the hospital librarian beyond the support and service role toward a more direct role in patient care.

Loraine F. Schacher177 (2001) demonstrated the value of supplementing the information in doctors' heads with information from the published literature delivered to the point of care. Most of the physicians interviewed in three studies conducted in Chicago; Rochester, New York; and the United Kingdom said that answers to their questions from the literature provided new information; refreshed their memory regarding details or facts; or substantiated previous knowledge or beliefs, improving their confidence in their decisions.

C. R. Fikar\(^{178}\) (2001) said that even with information literacy education and the moving of systems toward easy interfaces, improved access and evidence-based medicine synthesis services, a clinical team can benefit from a clinical librarian intervention.

Evagelia Lappa\(^{179}\) (2004) brought up the historical perspective of clinical librarianship. The author found that an evidence-based culture could provide the opportunity for libraries to become Centers of Evidence and librarians to play a new high profile, proactive role as educators and facilitators.

Linda Ward\(^{180}\) (2005) described a survey carried out in February 2004, the aim of which was to summarize the form and content of clinical librarian (CL) and other similar outreach information services to UK health professionals in the acute (secondary or tertiary) sector. A summary of a ‘typical’ clinical librarian revealed by this survey was given, with a major conclusion that there was a very mixed picture of activity. Opinion on how far CLs should go in fully appraising search results was uncertain.

S. L. Maccall\(^{181}\) (2006) described and evaluated the use of Clinical Digital Libraries Project (CDPL) digital library collections in terms of their facilitation of timely clinical information seeking. It has been found that the CDPL collections provided timely access to high quality web clinical resources when used for information seeking in medical education and hospital or clinic environments from North


American and non-North American locations and consistently provided access to the sought information within the documented two minute standard.

Karla Van Kessel\textsuperscript{182} (2012) observed that —

1. The clinical librarian could be accepted as part of a patient care teaching team by contributing to educational activities. The clinical librarian provided quick and useful information to assist in the decisions and management of patient problems.

2. There was an opportunity to strengthen and modify the information seeking behavior of the health professional.

3. As patient care questions recur, there was a need for a "patient care information system" which can be initiated and supported through the provision of photocopied articles.

2.5.2 Clinical Librarians as Change Agent

Valerie Sagers and Marjorie Seeger\textsuperscript{183} (1983) reported that the medical clinical librarian was a special resource person.

M. G. Umlauf and S. Sherman\textsuperscript{184} (1992) described the rhetorical gap between clinical practice and academia. This gap was tested by the development of a special clinical medical librarian programme grant to facilitate use of research by staff nurses.

R. J. Veenstra and E. H. Gluck\textsuperscript{185} (1992) stated about librarians and information specialists as "the clinical librarian goes closer to the physicians, providing a

\textsuperscript{182} Kessel, K. V. (2012). Gertrude Lamb's Pioneering Concept of the Clinical Medical Librarian. \textit{Evidence Based Library and Information Practice, 7}(1), 125-128.


diagnosis profile for each case. We may not want to presume to judge the values of EBM in practice, as we are not directly involved in patient care."

M. M. Wagner and G. F. Cooper\textsuperscript{186} (1993) identified clinical medical librarian services as "information retrieval systems", because both provided information to clinicians without requiring that a clinician actively seek information.

N. B. Giuse et al.\textsuperscript{187} (1998) pointed out the new role of the clinical librarian as an educator, using evidence as the basis of practice at the "point of care", reflects the change in approach which has taken place in medical practice.

E. K. Killingsworth\textsuperscript{188} (2000) briefly outlined the development of the clinical library service and the subsequent evolution of the service in the medical and hospital library setting. The idea of clinical librarianship was to provide comprehensive library service to physicians directly involved in patient care by placing librarians on patient care teams. The advantages and the disadvantages of such a service were detailed. Suggestions for the survival of the service in the current library climate are given.

V. Florance, N. B. Giuse and D. S. Ketchell\textsuperscript{189} (2002) provided two case studies, one clinical and one bioscientific that elucidate knowledge and training requirements for information specialists who work as peers in patient care and research settings. This article explored preparation for work in information-rich, problem-solving environments.


Elizabeth Rigby, Lucy Reid, Joanna A. Schipperheijn, Latha Weston and George Ikkos\textsuperscript{190} (2002) stated that provision of the clinical librarian service enables clinicians to apply the evidence to their clinical practice and ensures that patients receive the best quality of healthcare possible. Through their intense involvement with the teams they serve, the clinical librarians bring a depth of contextual information to the searches they perform, making the information retrieved highly specific to the cases in question. But adaptation to change is not enough. Even as librarians had increased their roles in health environment as value-added educators and information providers, they need to continue training in different facets: conferences, short courses, seminars. Librarian's participation in EBM is rooted in past practices most notably in CML. L. Zipperer\textsuperscript{191} (2004) described that librarians could improve the safety of medical care through greater participation in patient safety initiatives. A librarian's expertise in accessing the evidence base could enhance the safety and appropriateness of care in a clinical environment. In addition, librarians could apply specific technical knowledge management skills to medicine. To realize improvements from these skill sets, healthcare leaders must considered ways of working with librarians to enhance patient safety.

H. A. Brown\textsuperscript{192} (2004) described that clinical medical librarians stepped out of the library and joined the patient care team and they were present to report the literature, take literature search requests and, most importantly, perceive information needs at Morning Report, bedside rounds, or weekly conferences. Within 24 hours or less, they returned to the patient care team with literature to aid in patient planning. Clinical


medical librarians also teach online searching in an evidence-based way and help patient care team members with other research needs.

L. J. Schwing and E. E. Coldsmith\textsuperscript{193} (2005) mentioned that medical librarians typically contributed to patient care from the confines of the library in response to practitioners' requests for literature searches, information pearls, and evidence-based information. This paper illustrated how the librarian could become part of a clinical team outside of the library and provide real-time reference services while teaching by example. Benefits of the alliance include the integration of disciplines to provide enhanced resident learning and improved patient care.

Herma C. H. Coumou and Frans J. Meijman\textsuperscript{194} (2006) pointed out clinical medical librarians as intermediators to provide answers to clinical questions of primary care physicians.

Christine Urquhart, Janet Turner, Jane Durbin and Jean Ryan\textsuperscript{195} (2007) revealed that collaboration with a clinical librarian increased clinician willingness to seek information. Clinical librarian services should leverage structured training opportunities such as journal clubs.

Jonathan Eldredge\textsuperscript{196} (2007) proved through a study that at the clinical librarian services to the four intervention groups had changed the group members' information seeking behavior.


\textsuperscript{196} Eldredge, J. (2007). Do Clinical Librarians Matter? The First Randomized Controlled Trial in Librarianship. \textit{Evidence Based Library and Information Practice, 2}(4), 84-87.
D. E. Banks et al. (2007) showed that presentation of a case at morning report, followed by the timely dissemination of the results of an online literature review, resulted in a shortened length of stay and lower hospital charges compared with controls. Morning Report, in association with a computerized literature search guided by the librarians, was an effective means for introducing evidence-based medicine into patient care practices.

J. McGowan, W. Hogg, C. Campbell and M. Rowan (2008) pointed out in their study that providing timely information to clinical questions had a highly positive impact on decision-making and a high approval rating from participants. Using a librarian to respond to clinical questions may allow primary care professionals to have more time in their day, thus potentially increasing patient access to care. Such services might reduce costs through decreasing the need for referrals, further tests, and other courses of action.

J. Kelson (2008) stated that morning report presentation with literature search was associated with decreased length of hospital stay for patients. Clinical librarian could play the role of catalyst in this context.

Alison Weightman, Christine Urquhart, Sian Spink and Rhian Thomas (2008) said that the librarians were involved in part of the progress of getting research into practice, getting evidence to the bedside that involved resolution of clinical problems,


with best, available, up to date external evidence from systematic research, clinically relevant and applicable to the problem at hand.

K. Davies\textsuperscript{201} (2011) pointed out that evidence-based medicine extends the librarian's role beyond identification of the literature to involvement in practicing and teaching by quality filtering and critical appraisal of the literature. These activities required librarians to obtain expert knowledge of medical terminology etc. according to him that was the only way to meet all these rapid changes. Increasingly libraries need to seek the evidence from information science research of the effectiveness of these methods and interventions, whether for user education or information service provision.

2.5.3 Tasks and Attitudes in Clinical Librarianship

C. Korvin, R. H. Pearce and J. Stanley\textsuperscript{202} (1975) discussed role of clinical librarian in admission screening. The potential clinical benefit was assessed on one thousand patients admitted to a general hospital during a 6-month period. Although screening might reveal many abnormal test results, the clinical benefits were not impressive.

J. M. Farmer\textsuperscript{203} (1977) described the role of the clinical librarian in establishing information flow within clinical teams at teaching hospitals.

Gretchen Gearhart Claman\textsuperscript{204} (1978) described what clinical librarian do and why with special reference to Clinical Medical Librarian programme at School of Medicine, University of Missouri-Kansas City.


J. G. Marshall\textsuperscript{205} (1979) explored the role of clinical librarians in providing information services to patients, as they accompanied health professionals during daily patient care activities, and examined two projects evaluating clinical librarianship.

Gerri G. Lawrence\textsuperscript{206} (1979) described the responsibilities of the clinical medical librarian, an occupation in which the medical librarian operated in a clinical setting, identifying information needs of medical personnel through direct patient-physician-librarian contact.

Glynn Harmon, Martha Victory and Susan Harvey\textsuperscript{207} (1982) commented on the functions of clinical medical librarians (CMLs) and emphasized the importance of the ability of CMLs to anticipate the information needs of the clinical personnel they serve.

Naomi Miller\textsuperscript{208} (1984) discussed the use of journals by clinical librarians to provide information to satisfy users' information need.

J. M. Hurych and A. C. Glenn\textsuperscript{209} (1987) pointed out that the librarian's primary task was to facilitate the ideals which were articulated in the Library Bill of the Rights, the Freedom to Read Statement, and the Freedom of Information Act.

Deborah D. Halsted, Deborah H. Ward and Dana M. Neeley\textsuperscript{210} (1989) described the evolving role of clinical medical librarians in online education or training, end-user


searching support, tailored instructional programmes, the research partnership and as library contact person. The authors predicted that the librarian’s role will not end when clinicians are taught to search the literature; instead, CML services could be enhanced by providing additional educational opportunities. The relationship of the CML with clinical departments is truly an opportunity to exemplify what excellence in information services and user education can do to enhance clinical practice.

A. W. Hafner (1990) mentioned that a librarian was to provide current, accurate and relevant health information, and also must balance responsibility to serve the institution’s best interests. The responsibilities might depend upon whom the librarian was serving. In dealing with a physician, the primary responsibility to that person was the provision of information. Different types of information have different effects on people.

L. U. Turman, J. L. Koste, A. S. Horne and C. E. Hoffman (1997) discussed about the Clinical Medical Librarian (CML) Programme of the Tompkins-McCaw Library which was a special instructional initiative to teach third-year medical students the use of information resources in the clinical setting. Librarians spend one week with selected internal medicine teams participating in work rounds and instructing team members in the use of the medical literature. The librarian assisted team members to identify and retrieve relevant information through computer workstations located in the hospital. Photocopies of journal articles were made available to team members through the CML document delivery programme.

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A. Lusher\textsuperscript{213} (1999) mentioned that the clinical librarian would usually attend bedside rounds or clinical meetings where individual patients were discussed, questions on care were raised and specific information sought. The objectives of the clinical librarian were to conduct literature searches for clinical problems and continuing educational requirements, and to provide same-day or next-day access to quality-filtered information in the form of articles or reference material.

A. Booth, A. J. O'Rourke and N. J. Ford\textsuperscript{214} (2000) concluded in their article that the use of the EBM-structured forms was associated with more precise searches and more detailed search strategies, considerable work remains on making these forms acceptable to both librarians and users. Nevertheless, with increased familiarity and improved training, information retrieval benefits could be translated into more effective search practice.

Linda M. Ward, Claire J. Honeybourne and Janet Harrison\textsuperscript{215} (2001) argued that an outreach information service in clinical setting could meet the clinical governance agenda of the Trust by supporting evidence-based practice, teaching and learning and continuing professional development.

Lucy Reid, George Ikkos and William Hopkins\textsuperscript{216} (2002) revealed that the heart of the clinical librarian service was the provision of patient-focused information to clinicians on the selected teams to support them in practicing evidence-based healthcare. To promote requests for and the use of information, the clinical librarians were available


in the clinical setting. Depending on the team, they attend ward rounds, referral meetings, outpatient clinics, team meetings and educational meetings.

Andrew Booth\textsuperscript{217} (2002) identified the factors key to the adoption of innovations as—

- The presence of identifiable enthusiasts for innovation or change;
- Conductive power relationships (i.e. lack of conflict with national policies or professional opinion);
- Adaptability to local conditions;
- A general perception that the innovation meets current needs;
- Minimal requirements for extra resources.

Keating Liza, Carter Helen, Darwent Melanie, Bateman Sally, Mackay Donald M. and Pullinger Rick\textsuperscript{218} (2004) described a working partnership between the Cairns Clinical Librarian Service, Healthcare Libraries, University of Oxford and the Emergency Department (ED) at the John Radcliffe Hospital, Oxford. This collaboration resulted in the establishment of a guideline development group in June 2002. The aim of the group was to produce a set of easily accessible, user-orientated, evidence-based guidelines for the use of clinicians in the Emergency Department, within a realistic timescale. The Cairns Clinical Librarian Project was built on previous models of clinical librarianship and incorporated an evaluation of previous programmes. The objective was to provide information to clinicians at the time and point of need. Consultation with the ED from the outset determined the approach adopted by the Cairns team. Clinical guidelines had been shown to improve clinical practice. A piece of diagnostic analysis was undertaken to ensure a coherent strategy


was developed for the guideline project. An 'intermediate approach' was adopted, where existing valid guidelines were modified to fit local circumstances. The authors strove to be transparent at all times about all aspects of the guideline development process. Formative evaluation has shown how the application of evidence-based healthcare needs adequate resources and requires people with appropriate knowledge and skills. This article charted the progress of the project and highlighted how the partnership between the clinical team and the Clinical Librarian had been deemed to be essential to the success of the project.

A content analysis of clinical librarian job advertisements, examining job titles and duties was undertook by Sally J. E. Sargeant and Janet Harrison (2004). Twenty-three advertisements were scrutinized and it has been found that several duties could be classified as core to the role of the clinical librarian. However there was a great diversity of duties attached to this core, reflecting an absence of nationally accepted practice in UK.

D. Ward, S. E. Meadows and J. E. Nashelsky (2005) described the contributions of medical librarians, as members of the Family Physicians' Inquiries Network (FPIN), to the creation of a database of clinical questions and answers that allows family physicians to practice evidence-based medicine using high-quality information at the point of care. The medical librarians had contributed their evidence-based search expertise and knowledge of information systems that support the processes and output of the consortium. It has been found that all of the activities of the consortium were highly collaborative, and the librarian community reflects that. The FPIN librarians

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were valuable and equal contributors to the process of creating, updating, and maintaining high-quality clinical information for practicing primary care physicians. Of particular value was the skill of expert searching that the librarians bring to FPIN's products.

D. L. Vieira and K. Dunn\footnote{Vieira, D. L., \\& Dunn, K. (2005). Peer training in expert searching: the observation effect. \textit{Journal of the Medical Library Association}, 93(1), 69-73.} (2005) studied to determine if searchers' observing each others' search processes was an effective training method and if sharing through observation could strengthen search skills. It has been found that easy to implement, the peer-training model was an effective way to train searchers as well as help keep skills up to date.

J. Verschuere\footnote{Verschuere, J. (2005). The role of the clinical librarian: can our experience of supporting clinicians be transferred to managers? \textit{IFMH Inform}, 16(1), 13-15.} (2005) revealed that a clinical librarian works as an integral part of a clinical team. The role of a clinical librarian was multi-faceted and dependant on the integration achieved within the targeted area. The skills acquired by a clinical librarian were not unique to working with clinical staff, as they were transferable to any outreach service provision.

A. M. Tod, B. Bond, N. Leonard, I. J. Gilsenan and S. Palfreyman\footnote{Tod, A. M., Bond, B., Leonard, N., Gilsenan, I. J., \\& Palfreyman, S. (2007). Exploring the contribution of the Clinical Librarian to facilitating evidence-based nursing. \textit{Journal of Clinical Nursing}, 16(4), 621-629.} (2007) examined the potential role of the clinical librarian in facilitating evidence-based practice of nurses in acute hospital settings and develop a model for the role. It has been found that clinical questions were unanswered because of barriers of time, skills deficits and access to resources. Literature searching, skills training and evidence dissemination were the main areas of work the staff requested that a clinical librarian should undertake. It was anticipated that the clinical librarian could interact and work
productively with nursing staff with a limited but regular presence on the ward. Interim communication could be via e-mail, phone and written suggestions and requests for work. It was seen to be vital that the clinical librarian worked in partnership with staff to build evidence-based practice capacity and ensure clinical relevance of the work.

G. Hannigan224 (2008) examined physician use of an Evidence-Based Medicine (EBM) literature request service available to clinicians through the institution’s electronic medical record system. It has been found that implemented marketing and communication strategies did not significantly increased the use of the EBM Literature Request Service. Those who used the service found it relevant and often shared the information with others. Based on a small number of respondents and survey information, the librarian-provided EBM Literature Request Service was “well-received”.

M. Bandy, J. Cordon and E. Graves225 (2008) stated that librarians understand they need to move outside the four walls of the physical library and provide information support for clinicians in various settings. Librarians round with patient care teams as clinical librarians. They sit on quality improvement and patient safety committees in order to provide information to those groups. Many were members of their organization’s Institutional Review Board. Some of these activities were done for a specific purpose and were short-lived. Other activities become institutionalized as the value of the librarian’s contribution was recognized.

Nick Bakalis\textsuperscript{226} (2008) commented on A. M. Tod et al. (2007) Exploring the contribution of the Clinical Librarian to facilitating evidence-based nursing and suggested that clinical librarians can enhance nurses with useful electronically addresses and support them technically. However, to achieve this, clinical librarians need to have basic knowledge about the nursing profession (especially knowledge for nurse specialization) to use the ‘right’ key words and thus produce useful information. Furthermore, if the clinical librarian is a member of the ward team, it would ‘force’ nurses to spend more time on libraries.

E. Greco, M. Englesakis, A. Faulkner, B. Trojan, L. E. Rotstein and D. R. Urbach\textsuperscript{227} (2009) pointed out that quality of care rounds, also known as Mortality and Morbidity conferences, were an important and time-honored forum for quality audit in clinical surgery services. The authors created a modification to their hospital’s Quality of Care rounds by incorporating a clinical librarian, who assisted residents in conducting literature reviews related to clinical topics discussed during the rounds. The objective of this article was to describe the authors’ experience with this intervention. The clinical librarian programme had greatly improved the quality of care rounds by aiding in literature searches and quality of up-to-date, evidence-based presentations.

T. J. Coats, S. Sutton, C. Vorwerk and M. W. Cooke\textsuperscript{228} (2009) reviewed the role of the clinical librarian in the emergency department. It has been found that the clinical librarian was playing an important role in patient care.

S. Määtä and G. Wallmyr²²⁹ (2010) explored nurses' and ward-based clinical librarians' reflections on ward-based clinical librarians as facilitators for nurses' use of evidences-based practice. It has been found that clinical librarian presence in the ward was enhancing the awareness of and the use of evidence-based practice. The authors thought that the fusion of the information and knowledge management skill of the ward-based clinical librarian and the clinical expertise of the nurses can be of value.

J. Harrison and V. Beraquet²³⁰ (2010) studied to determine the background, education, training experience, roles and responsibilities of practicing Clinical Librarians (CL) in the UK. Results/analysis detail the skills and activities undertaken by CLs. Searching for information for Clinicians was the activity most frequently undertaken. Developing good relationships with other healthcare professionals was considered essential.

A. Booth²³¹ (2010) said that a clinical librarian joined a hospital team as an information officer. He or she might attend rounds and conferences and consult directly with students and faculty in an effort to provide information support expeditiously and targeted to specific cases. After a session with the clinical team the librarian returned to the library and might did a MEDLINE search, online search etc., prepared a brief bibliography, produced photocopies of relevant material, or located specific facts related to an identified problem. Many clinical librarians also provide training to residents and students to use information resources more effectively and efficiently. They often accumulated files of articles of frequent interest.


E. M. Aitken, S. E. Powelson, R. D. Reaume and W. A. Ghali\textsuperscript{232} (2011) studied to measure the effect of including a clinical librarian in the healthcare team on medical residents and clinical clerks. It has been found that the clinical librarian intervention had a significant positive effect on medical trainees' self-reported ability to independently locate and evaluate evidence resources to support patient care decisions. Notably, 30 of 34 (88\%) reported having changed a treatment plan based on skills taught by the clinical librarian, and 27 of 34 (79\%) changed a treatment plan based on the librarian's mediated search support. The authors concluded that clinical librarians on the care team led to positive effects on self-reported provider attitudes, provider information retrieval tendencies, and, notably, clinical decision making. Future research should evaluate economic effects of widespread implementation of on-site clinical librarians.

2.5.4 Recent terminology in Clinical Librarianship

Augustus A. White, Madeleine E. Kolisch Savit and Marjorie E. Mcbride\textsuperscript{233} (1980) described clinical librarians as \textit{clinical information coordinators} (CIC) in the department of orthopaedic surgery at the Beth Israel Hospital in Boston. Consolidation of the conventional role as librarian and a new role as manager of information generated by the department when carried by a person, he or she is known as CIC.

D. D. Halsted and D. H. Ward\textsuperscript{234} (1989) mentioned that a clinical librarian must be able to interact effectively with other health professionals and have the ability to


assess a need and respond quickly with relevant information support. The clinical librarian as Chief Information Officer (CIO) was gaining popularity, especially in the healthcare field. Librarians in CIO roles offer the ability to examine the nature of information, assess what information was needed and used by the organization, and discovered why the information needed.

According C. J. Jones235 (1993) librarians function as "watching people" to understand and embrace the concept of the importance of using information to assist in decision making.

Julie Anne Watson and Anne Weist236 (2000) agreed that the job title would be Clinical Support Librarian (CSL) rather than a Clinical Librarian (CL) at Forest Healthcare Trust. The CSL was an integral part of the Trust’s Library team and has taken on much of the search skills training sessions, both formal and informal.

Frank Davidoff and Valerie Florance237 (2000) were putting the finishing touches to an editorial for the Annals of Internal Medicine that will almost certainly bring discussions of clinical librarianship to a new level of intensity as informationist.

T. Scott Plutchak238 (2000) in his editorial used the term ‘informationist’ in healthcare setting.

R. M. Jerome, N. B. Giuse, K. W. Gish, N. A. Sathe and M. S. Dietrich239 (2001) examined the types of questions received by Clinical Informatics Consult Service

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(CICS) librarians from clinicians on rounds and to analyze the number of clearly differentiated viewpoints provided in response. By critically analyzing the medical literature, CICS librarians were providing a time-saving and valuable service for clinicians and charting new territory for librarians.

D. A. Swinglehurst, M. Pierce and J. C. A. Fuller240 (2001) mentioned that ‘clinical informaticist’ service increased access to evidence for busy clinicians. Satisfaction was high among users and clinicians stated that changes in practice would occur.


Trisha Greenhalgh, J. Hughes, C. Humphrey, S. Rogers, D. Swinglehurst and P. Martin242 (2002) pointed out that an informaticist service should be judged on at least two aspects of quality—an academic dimension (the technical quality of the evidence based answers) and a service dimension (the facilitation of questioning behaviour and implementation).

G. D. Byrd243 (2002) suggested that health information professionals in clinical settings could be educated and trained by health informationist to provide what people might call health information care.

Nancy Calabretta\textsuperscript{244} (2002) said that medical librarians have unique skills, the ability to learn new tasks, and the desire to work as part of the healthcare team. In the age of electronic information they may be called as \textit{patient-centered librarian}'.

N. Sathe and N. B. Giuse\textsuperscript{245} (2005) described that Biomedicine and health today are supported by a tightly woven interdisciplinary braid of (1) the discovery and use of information content, (2) its storage, management, and retrieval by information science (including the practice of librarianship) enabled by (3) the tools of information technology. Few specialists in one strand of the braid could work without some understanding of the other two strands. None have a monopoly on any one strand. Professional titles in research, education, and practice often are inadequate descriptions of the cross-disciplinary roles of their holders, or the actual practice of the professions. Some are \textit{medical librarians}, \textit{health information managers}, \textit{biomedical informaticists}, and \textit{clinical informationists}. Others work with controlled vocabularies, imaging and radiation therapy informatics, or business information systems.

M. McKnight\textsuperscript{246} (2005) categorized informational professionals in biomedicine and health sciences as \textit{librarians, medical librarian, clinical librarian, informaticists, informationists} etc.

N. B. Giuse, T. Y. Koonce, R. N. Jerome, M. Cahall, N. A. Sathe and A. Williams\textsuperscript{247} (2005) mentioned that achieving evidence-based practice would require new

approaches to providing information during healthcare delivery and to integrating evidence and informatics at the point of care. To support evidence-based practice, Vanderbilt University Medical Center's Eskind Biomedical Library (EBL) introduced the role of clinical informationist, an information specialist with sufficient knowledge and insight to function as a true partner in the healthcare team.

J. M. Campbell and N. K. Roderer (2005) revealed that at Johns Hopkins University, three NLM-funded fellowship programmes provide opportunities for librarians to utilize the rich environments of the Welch Medical Library and the Division of Health Sciences Informatics in support of life-long learning as informaticians or informationists.

K. B. Oliver and N. K. Roderer (2006) offered a definition of a new health professional, the 'informationist', whose function was to ensure evidence-based health practice.

Marcus A. Banks (2006) also defined the informationist with a case study from the Frederick L. Ehrman Medical Library. It has been found that the role of informationist was similar to that of clinical medical librarian.

V. Kurup and D. Hersey (2007) coined the term 'perioperative librarian' in their article to explore the impact of clinical medical librarians with particular emphasis on their application in the perioperative setting.

Jocelyn A. Rankin, Suzanne F. Grefsheim and Candace C. Canto\textsuperscript{252} (2008) pointed out that the informationist concept remains in the early adopter stage; it appears that domain knowledge, continuous learning, and embedding (working in context) are the three things which are essential to success.

S. A. Mulvaney, L. Bickman, N. B. Giuse, W. E. Lambert, N. A. Sathe and R. N. Jerome\textsuperscript{253} (2008) examined the impact of a Clinical Informatics Consult Service (CICS) on evidence-based decision making and knowledge implementation.

Jessie McGowan, William Hogg, Craig Campbell and Margo Rowan\textsuperscript{254} (2008) discussed that the “Just-in-time Information” (JIT) librarian consultation service was designed to provide rapid information to answer primary care clinical questions during patient hours. This study evaluated whether information provided by librarians to answer clinical questions positively impacted time, decision-making, cost savings and satisfaction.

Andrew Booth and Claire Beecroft\textsuperscript{255} (2010) described Clinical Question Answering Services (CQAS) in their paper.

Maura G. Flynn and Claire McGuinness\textsuperscript{256} (2011) highlighted the factors that characterize and limit hospital clinicians’ information seeking, and suggested the Clinical Informationist (CI) as a potentially useful addition to the clinical team, to help them to resolve their information needs for patient care.

2.5.5 Perspectives from Clinical Librarians

Jan Farmer and Beth Guillaumin\textsuperscript{257} (1979) described that through the CML programme at Biomedical Library, University of California, Los Angeles (UCLA), not only the librarians gained a new appreciation of the process of clinical decision making and the information needs of the patient care team, but CML attendance has also helped draw attention to the library as an important resource in the healthcare setting and to librarians as colleagues in supporting physicians' efforts to give the best patient care possible.

Marilyn B. Gorman-Sullivan and Jeanne M. Sarkis\textsuperscript{258} (1987) suggested that personality, drive and an interest in clinical medicine are important determinants for effective clinical librarianship. From the results of their study authors concluded that those who select clinical medical librarianship had a strong desire to work in a setting that does not restrict them to the library and to work closely with other health professionals.

Carole M. Gilbert\textsuperscript{259} (1999) mentioned that a CML programme could be initiated by any medical librarian regardless of the size of the library staff or the hospital. It took a minimal commitment of time and resources and could be adapted to hospitals that do not have residency programmes. It was an effective way for librarians to become more involved in the continuing education of medical staff, nurses, and allied health personnel.


L. F. Schacher\textsuperscript{260} (2001) pointed out two concerns of libraries in healthcare settings. These are –

- To establish the basis for a guideline document, subject to continued revision, which would provide standards for the Hospital Libraries System, developed by qualified professionals and recognized by the corresponding official bodies.
- To promote the creation of consortia integrating all the organizations involved in the area of health sciences - universities, hospitals, the pharmaceutical industry, etc., in order to facilitate cooperation and the rational use of financial, technical, and human resources.

J. M. Homan and J. J. McGowan\textsuperscript{261} (2002) examined the new roles for health information professionals, new approaches to education and training, and related issues of credentialing, certification, and licensure.

E. Lappa\textsuperscript{262} (2005) argued that the introduction of new technology and rapid growth of medical knowledge created a demand for new ways of providing information. Clinical librarian programmes might deliver patients specific information in a timely manner. The mission of the clinical librarian was to facilitate access to quality information which was necessary for improving health, and to act as an informationist in the emergency department.

G. J. Perry and M. R. Kronenfeld\textsuperscript{263} (2005) described that if clinical librarians are concerned with the nature of the information and its processes in the organization,


they are more likely to assess its value and its effect on the institution's decision-makers. The main concerns of clinical libraries are:

- To analyze the points of view of different professionals working with information in health sciences and needing to access information for their work, in order to reach a deeper understanding of their information needs.
- To achieve genuine integration of libraries and documentation centers in health information systems.
- To promote awareness of the need to produce and disseminate information with added value; playing an active role as a fundamental part of information systems in health sciences.

2.5.6 Problems and possible developments of Clinical Librarianship

B. Halbrook264 (1983) noted that “the few reports of discontinued programmes indicate the lack of a budgetary support for the clinical librarian is the major reason for programmes demise”.

Naomi Miller265 (1989) observed that free access to CD-ROM MEDLINE reduced the role of the CML in direct information provision to house staff and led to an important change in the nature of user education programmes for the Department of Medicine at the Medical College of Pennsylvania and in the activities of the CML.

C. M. Gilbert266 (1999) mentioned that there were no standards for hospital libraries which concern clinical librarians.

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C. D. Dee and K. E. Wellik\textsuperscript{267} (2000) described that while many of the objectives of the clinical librarianship appear justified in policy terms, there were still several technical, logistical, and social obstacles to be overcome.

J. McGowan and M. Sidlofsky\textsuperscript{268} (2002) predicted that clinical librarians may be invisible as Information Technology professionals are slowly taking on new roles. E. G. Detlefsen\textsuperscript{269}(2002) pointed out that clinical librarians are required to have considerable skills and more technological expertise in the use of electronic and digital information resources, to be able to create an electronic and digital resource by themselves, to produce teaching materials, and provide training for staff and users. This requires considerable commitment to staff development.

John W Ely et al.\textsuperscript{270} (2002) encountered 59 obstacles and organized according to the five steps in asking and answering questions: recognize a gap in knowledge, formulate a question, search for relevant information, formulate an answer, and use the answer to direct patient care. Six obstacles were considered particularly salient by the investigators and practicing doctors: the excessive time required to find information; difficulty modifying the original question, which was often vague and open to interpretation; difficulty selecting an optimal strategy to search for information; failure of a seemingly appropriate resource to cover the topic; uncertainty about how to know when all the relevant evidence had been found so that


the search can stop; and inadequate synthesis of multiple bits of evidence into a clinically useful statement.

Janet Harrison and Sally J. E. Sargeant\textsuperscript{271} (2004) identified the problems as:

\begin{itemize}
\item An increased workload for the CL;
\item An expanded service that was unsustainable;
\item Lack of physical library space.
\end{itemize}

M. Guessferd\textsuperscript{272} (2006) pointed out that specific working stress, even if it was not possible to feel prepared to handle everything, a new service was still evaluated. There is little time for 'organizational' or personal learning.

S. C. Whitmore, S. F. Grefsheim and J. A. Rankin\textsuperscript{273} (2008) recognized obstacles to be overcome. These include:

\begin{itemize}
\item Hospitals' budgets are usually very constricted and libraries receive the residue, making human resource management planning difficult.
\item Even if the users are not prepared to get better quality, filtered, updated information with the new technology by them, they may not accept the clinical librarians' intermediary role in their reference work. Future developments seem to meet the needs of CL and provide the means of learning about the accessing relevant information resources. Hyperlinks within the courseware, for example, provide an interactive and flexible learning approach.
\end{itemize}

Other observed trends are: the availability of full text to off-site users along with the integration of some information skills support into the courseware and curriculum.


A. Sutton and M. J. Grant (2011) revealed that in the recent times of recession and budget cuts, it was more important than ever for library and information services to deliver cost-effective services.

2.5.7 Evaluating the effectiveness of Clinical Medical Librarian Programmes

V. Algermissen (1974) evaluated biomedical librarians in a patient care setting at the University of Missouri-Kansas City School of Medicine. According to him, the biomedical librarian had been placed in a patient care setting working in the specific environment of a six-year medical school guided by the docent team concept (docent is defined as a clinician-scholar). Within this framework the specifically qualified Clinical Medical Librarians functioned within the docent unit. Three dissemination techniques or systems—LATCH, Current References, and Latest Topics—were discussed. Note was made of the Clinical Medical Librarian's role in teaching, demand search-document delivery in answer to anticipated and actual requests, and the design of the Patient Care Information System.

A. A. Roach and W. W. Addington (1975) described the effects of an information specialist on patient care and medical education. According to the authors, a medical librarian joined the pulmonary medicine healthcare team at Cook County Hospital in order to provide a quick response to information needs regarding patient care, graduate medical education, continuing education, and research. Regular attendance at rounds and conferences enabled the librarian to initiate immediately literature searches in response to both clinical problems and educational requirements. A basic reference supplied to the medical librarian/information specialist by a physician

frequently expedited literature research. It was found that patient care and education were enhanced by the rapid access to recent information and that team members used the library more. Close cooperation between the information specialist and physicians significantly facilitated the searches and saved time for healthcare team members.

Lois Ann Colaianni\textsuperscript{277} (1975) evaluated clinical medical librarians in Cedars-Sinai Medical Center which is a private teaching hospital.

G. Lamb\textsuperscript{278} (1975) commented after evaluation of a CML programme at Hartford Hospital that the clinical librarian could be accepted as a working member of the patient care teaching team because of their ability to answers questions quickly and the information provided influenced the management of patient problems.

The CML programme at the Washington University School of Medicine was evaluated by C. Staudt, Barbara Halbrook and E. Brodman\textsuperscript{279} (1976). The authors showed that residents would not pay for CML services. The majority said they considered such a service part of their education.

J. G. Schnall and J. W. Wilson\textsuperscript{280} (1976) assessed the clinical medical librarianship programme at the University of Washington Health Sciences Library to determine the benefits of the programme to patient care and to the education of the recipients of the service. Results of a questionnaire reflected overwhelming acceptance of the clinical medical librarianship programme. Guidelines for the establishment of a limited clinical medical librarianship programme were described. A statistical cost analysis of the programme was included.


B. Greenberg, S. Battison, M. Kolisch and M. Leredu281 (1978) evaluated that a CML programme in a large university-based teaching hospital setting was viewed by the majority of clinicians as education-oriented, with slightly fewer clinicians viewing it as patient care oriented. The CML service had been utilized for research purposes only when it was clear that case-relevant information could evolve into research intended to have "clinical" impact. This study reported the results of a questionnaire circulated among clinicians receiving CML support by a large medical school library. Results indicated that (1) the CML effected a change in information-seeking behavior by the clinicians—they obtained information that would not have been available to them if the CML had not been present in patient-management conferences; (2) relevancy of information provided by the CML was judged by the clinicians to be very high; (3) the accuracy of the CML's search, coupled with the rapidity of delivery, was found to be highly satisfactory; (4) acceptance of the CML within the patient care setting was acknowledged by the majority of clinicians, who contact the CML in-hospital and overwhelmingly prefer to do so; and (5) there was no statistically significant variation in the manner in which different medical specialties use the services of a CML. These findings justified implementation of a clinical medical librarian programme, on a modified basis, as an additional service to already existing reference services offered by a large medical school library.

Joanne Gard Marshall and John D. Hamilton282 (1978) described that the use of feedback from patients and health professionals to assess the impact of the librarians' participation in clinical settings. Benefits included: 1) increased accessibility of


information resources to patients, 2) a greater awareness by health professionals of the usefulness of biomedical literature and the library in patient care, and 3) an opportunity for the librarian to gain a first-hand view of activities and information needs in a clinical setting. Key points in determining the successful implementation of the project are given.

Gary D. Byrd and L. Arnold (1979) showed that young physicians, after regular association with more traditional medical library services, hold very positive impressions of the CML programme. The graduates also typically credit the CMLs with helping them to learn to use library resources effectively. These retrospective perceptions of the CML matched the short term benefits reported in other studies of similar programmes.

J. E. Gunning, J. Fierberg, E. Goodchild and J. R. Marshall (1980) mentioned that a programme utilizing the clinical librarian as a member of the patient care team had been developed by the staff of the Department of Obstetrics and Gynecology and the Medical Library Department, UCLA Medical Center. The objectives, methodology and costs of the programme were described. At the completion of one year evaluation of the programme indicated successful achievement of the objectives. Utilization of library literature search services by the Department of Obstetrics and Gynecology increased 12 percent after the programme initiation.

Sandra R. Clevesy (1980) evaluated a modified CML programme for the Community Hospital and experienced that a modified CML programme is a valid

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approach to facilitate the information transfer essential to the provision of quality medical care.

G. Scura and F. Davidoff286 (1981) measured the impact of clinical medical librarian services on actual case management and on diagnostic thinking in a random sample of 50 searches over five months provided to house officers on medical and pediatric services of a university hospital. Patient management was affected in 20% of cases, and diagnostic thinking was influenced in an even higher percentage of instances. In comparison with information generated by other ancillary services such as clinical laboratories, clinical librarian services appeared to be highly effective at an acceptable cost. Since the information generated by such searches may often result in further cost savings to patients, the potential overall efficiency of such services may be great.

J. G. Marshall and V. R. Neufeld287 (1981) evaluated the librarian's educational role in patient care settings. An information service was provided for health professionals, patients, and families by two part-time clinical librarians. Eight clinical areas were randomly selected from a pool of settings which met predetermined entry criteria. Four of these settings were randomly allocated to the experimental maneuver (that is, the clinical librarian service), and four were control settings. Results showed that the clinical librarians were accepted by health professionals and that services to all groups were viewed as successful. Significant differences in information-seeking patterns were found between study and control groups of health professionals. In particular, the study group was more likely to use the library for direct patient care and rated the librarian and library resources more highly as sources of information. This time-


limited and education-oriented model would be useful for settings in which a full-time librarian programme is not feasible.

N. P. Grose and G. G. Hannigan\textsuperscript{288} (1982) evaluated CML programme at department of Family Medicine of St. Lukes Episcopal Hospital, Houston and found that CML programme was highly time saving and provided information of high education value.

A. J. Kidder\textsuperscript{289} (1982) revealed that few libraries of size and service similar to the Southern Illinois University School of Medicine (SIU-SM) had offered, maintained the original CML programme. The findings suggested that medical school libraries should be very careful in their initiation or maintenance of CML programmes, especially during times of budgetary constraints.

A. Wilkin\textsuperscript{290} (1982) provided examples of evaluation based on the views of health professionals receiving the service, in the Guy's Hospital (UK) experiment that involved two as clinical librarians to the department of Surgery and Medicine between 1978 to 1980, recorded that information was not usually required urgently. This evaluation queried whether the requirement of instant access was valid.

G. Lamb\textsuperscript{291} (1982) revealed that clinical librarians in the Harford Hospital programme recorded in the diaries their observation of critical incidents related the acceptance of the librarian, changes in information seeking behavior, and impact on patient care. This was another example of a more detailed evaluation.


\textsuperscript{290} Wilkin, A. (1982). \textit{Users and uses of medical literature: selected themes from a clinical librarian experiment and its evaluation in the UK}. London: Guy's Hospital Medical School, Department of Surgery.

S. E. Harmony\textsuperscript{292} (1983) mentioned that CML programmes needed 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.

Evaluation also measures educational benefit to clinicians, medical students and other users.

Rajia C. Tobia, David A. Kronick and Gary D. Harris\textsuperscript{293} (1983) mentioned that the library and the department of medicine at the University of Texas Health Science Center at San Antonio cooperated in a three-month pilot project to test a clinical information consultation service that provides patient care information to house staff members in the clinical setting. Evaluation indicated that users were highly satisfied with the service. Results of this pilot project seem to show that a clinical information consultation service could be an efficient and cost-effective means to provide information in a patient-care setting.

B. Halbrook\textsuperscript{294} (1983) revealed that 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.

D. A. Hulkonen\textsuperscript{295} (1983) pointed out that some users identified with the CML as an individual rather than part of the library team.

J. Glick and M. Sullivan\textsuperscript{296} (1984) evaluated a CML programme at Froedtert Memorial Lutheran Hospital, Milwaukee. It has been found that CML programme saw increase in reference requests and search requests.

The history and evolution of clinical medical librarianship were analyzed and traditional and modified approaches, including LATCH, were reviewed by Kay Cimpl\textsuperscript{297}(1985). Cost and evaluation methods were outlined, indicating benefits and disadvantages of clinical medical librarian (CML) programmes. The future of CML programmes were also explored.

C. Yates-Imah, H. Goldschmidt and M. A. Johnson\textsuperscript{298} (1985) mentioned that a clinical librarian programme was developed for the Family Practice Inpatient Service at the San Francisco General Hospital Medical Center. Objectives of this special service were: (1) to provide relevant articles and other printed resources relating to patient care problems; (2) to alert the team to library resources; (3) to assist the attending physicians in building a reading file for the inpatient service; and (4) to determine library service needs of the team. Two patient cases are included which illustrate how the clinical librarian service functioned. The programme was successful and was recommended for inclusion in other family practice programmes or inpatient units.


E. K. Eaton\textsuperscript{299} (1985) also evaluated a CML programme at the Graduate School of Biomedical Sciences, University of Texas.

Five years of experience using the services of a full-time clinical medical librarian (CML) by the Department of Medicine at the Hospital of the Medical College of Pennsylvania had been reviewed by N. Miller and D. Kaye\textsuperscript{300} (1985). Over the five years there was a marked increase in queries from faculty and house staff members with an accompanying decrease in CML-initiated questions, while requests by students and others remained constant. The largest category of queries was patient-related. There were increases in the use of the CML for patient-related queries, for research, and for oral presentations. The number of requests obtained on rounds or in conferences decreased, while the number obtained by phone, in the library, or elsewhere increased. Requests for computer searches remained constant.

G. L. Barbour and M. N. Young\textsuperscript{301} (1986) pointed out that the educational value of morning report should be enhanced by thorough evaluation of the medical literature. The authors added a CML programme to their morning report 2 1/2 years ago to provide rapid, complete access to reference material relevant to topics discussed in morning report. MEDLINE searches and references were made available on a same-day basis; cumulative lists of these were provided to the staff and house staff at bimonthly and yearly intervals. All house staff used the CML service to some degree and the majority found it to be of value in making patient care decisions. Since the inception of the CML programme, the medical library had noted a more than twofold increase in the number of on-line reference searches and a similar increase in requests.


for searches by house staff. Patient care decisions had been improved through ready access to current medical literature, and the teaching programme had been enhanced by the creation of the CML programme as an integral part of morning report.

To determine the attitudes of medical school library directors and clinical department heads toward implementation and feasibility of a CML programme, forty randomly selected medical schools were surveyed by J. M. Demas and L. T. Ludwig (1991). A double-blind procedure was used to sample department heads in internal medicine, pediatrics, and surgery, as well as health sciences library directors identified by the Association of Academic Health Sciences Library Directors (AAHSLD) annual statistics. The survey instrument was designed to measure responses to the following attitudinal variables: acceptance and non acceptance of a CML programme; importance to patient care, education, and research; influence on information-seeking patterns of healthcare professionals; ethical issues; CML extension services; and costs. Seventy-nine usable questionnaires out of a total of 120 (66%) were obtained from clinical medical personnel, and 30 usable questionnaires out of a total of 40 (75%) were obtained from medical school library directors. Survey results indicated significant differences between clinical medical personnel and library personnel regarding attitudes toward CML influence on information-seeking patterns, ethics, alternative CML services, and costs. Survey results also indicated a continuing strong support for CML programmes in the medical school setting; however, differences of opinion existed toward defining the role of the CML and determining responsibility for funding.

R. J. Veenstra\textsuperscript{303} (1992) stated that the primary role of the clinical medical librarian (CML) – locating and providing quality-filtered, patient-specific information to physicians – has been questioned recently because of the dramatic rise in end-user searching. This study administered a questionnaire to evaluate the current impact of this service in a major hospital setting with a long established CML programme. The study showed that the CML provided house officers with information that affected patient care (defined as diagnosis, diagnostic tests, or treatment) between 40% and 59% of the time. This was true even though most physicians reported they generally researched the question prior to consulting the CML. In addition, the house officers in this study indicated that they distributed the CML-provided information to other healthcare providers 56%-96% of the time. Based on these limited results, it appeared that CMLs could continue to provide information that has a strong impact on patient care, despite the availability of an end-user local MEDLINE system.

R. J. Veenstra and E. H. Gluck\textsuperscript{304} (1992) evaluated the effectiveness of an ongoing clinical librarian programme in the intensive care setting. It has been found that clinical librarian programmes may deliver patient-specific information in a timely, cost-effective manner. This information has an impact in the intensive care setting.

A. B. Kuller, C. B. Wessel, D. S. Glinn and T. P. Martin\textsuperscript{305} (1993) conducted a study at the University of Pittsburgh to determine the effectiveness of the selection process by clinical medical librarians and to identify the criteria used by librarians and physicians to select relevant articles. The study analyzed the similarity between librarian and physician selections, the decision-making processes used by librarians


and physicians, and the utility of librarian selections versus those of physicians. No significant difference in utility between librarian and physician selection was found, suggesting that librarians could recognize and select useful articles as effectively as physicians. Both librarians and physicians based selection decisions primarily on article title, abstract, and journal title. Librarians were more likely to focus on Medical Subject Headings (MeSH) descriptors, while physicians focused on clinical applicability or similarity to a specific case. Journal selection data indicate that the principle internal medicine journals were the most frequently selected sources. The study demonstrated that librarians could effectively serve a quality filtering function in the clinical environment, and they should consider extending quality filtering activities to other arenas.

M. Royal, W. E. Grizzle, V. Algermissen and R. W. Mowry\textsuperscript{306} (1993) reported their experience with the first CML programme used to aid resident training in anatomic pathology. This programme was developed by the Lister Hill Library of Health Sciences (LHL) of the University of Alabama at Birmingham (UAB) to test the value of a CML programme in filling the clinical needs of medical students and residents by providing key recent references to the wide variety of diseases seen in a busy autopsy service. Use of a CL was accepted completely by both faculty and residents as a method of increasing their efficiency in evaluating the recent literature on diseases seen in the autopsy service. Their use of this programme broadened the scope and extent of specific case-oriented medical literature read by both residents and faculty.

L. M. Pasquinelli, E. S. Buescher and C. W. Gowen307 (1994) evaluated a CML programme at Eastern Virginia Medical School, Norfolk. It has been found that information turnaround time from CML was judged to be good and the usefulness of the information provided was good and appropriate with a positive effect on patient care.

N. B. Giuse et al.308 (1998) evaluated the Eskind Biomedical Library (EBL) at Vanderbilt University Medical Center (VUMC). The authors pointed out that clinical medical librarianship could be labor intensive and expensive. To capture the expertise, time, and effort librarians put into answering each clinical question received on rounds, VUMC's CML programme incorporated the ongoing creation of a searchable electronic database of clinical questions. Librarians entered each of their clinical questions, references, and filtered summaries into a relational database; a Perl Common Gateway Interface (CGI) script was used to implement a Web interface to the database.

The usefulness of the clinical librarian in obtaining relevant information for patient management was assessed by M. A. Iruoje, J. K. Henner and O. J. Akinade309 (1999) over a period of six months. The responses of the CL and Resident Doctors (RD) in finding answers to questions raised during ward rounds were compared. Specifically, the number of literature materials provided in response, the time it took for answers to be provided and the value of the answers were compared.

The result shows that the CL responded 100% of the time, while the RD provided 33% response. The average time it took the CL to respond was 3.9 days and 2 1/2 days for the RD. 60% of the information provided by the CL was useful. The overall assessment of the responses showed that the CL has more statistically significant responses than the RD (P<0.001). It is therefore, concluded that the CL can play significant role in hospital patient care.

S. Dodson\textsuperscript{310} (2001) evaluated a CML at University of Washington Health Sciences Library. It has been found that information supplied by CML was relevant and contributed to better clinical decisions.

S. K. Morley and H. S. Buchanan\textsuperscript{311} (2001) summarized the development of the role of clinical medical librarianship with description of the Clinical Medical Librarian (CML) Programme at the University of New Mexico Health Sciences Center in Albuquerque and discussed the potential evolution of this CML programme in context of the new role of informationist. Formative and summative evaluation strategies were also discussed.

L. Reid, G. Ikkos and W. Hopkins\textsuperscript{312} (2001) discussed how Barnet Community Healthcare NHS Trust chose to tackle some of these issues raised by clinical governance by implementing a clinical librarian service. It had an impact on the quality of patient care on an individual level as well as in terms of service provision. It stipulated that treatment should be evidence-based. Clinical governance also required staff to stay up-to-date with their education and training.


L. Glassington\textsuperscript{313} (2001) evaluated a CML programme at University College London Hospital, London. It has been found that CML was an integral part of the multidisciplinary team.

L. M. Ward, C. J. Honeybourne and J. Harrison\textsuperscript{314} (2001) tested the feasibility of an outreach clinical librarian service in an acute hospital setting, providing quality filtered research evidence at the point of clinical need. The design was based on a 6-month pilot with professional librarians attending clinical meetings responding to information needs raised there by providing appraised summaries of the published evidence, with full text and bibliographic material as appropriate. The main outcomes were usage statistics and clinicians' evaluation via a 23-question questionnaire completed each month seeking overall views of the service. Practical issues regarding the provision of the service were tested. The authors concluded that an outreach information service in the clinical setting could meet the clinical governance agenda of the Trust by supporting evidence-based practice, teaching and learning and continuing professional development. Earlier models of service were adapted to make the service cost-effective.

C. Honeybourne\textsuperscript{315} (2001) evaluated a CML programme at University Hospitals of Leiceser, NHS Trust, UK. The author examined the role of clinical librarian with 16 clinical departments at 3 hospital sites. It has been found that CML programmes were highly effective and save the time of the clinicians.


L. Reid, G. Ikkos and W. Hopkins\textsuperscript{316} (2002) found that Clinical librarians offered an effective way of combating some of the information needs of clinical governance at Barnet Primary Care NHS Trust. They could facilitate individual clinicians, multidisciplinary teams and organizations as a whole in providing evidence-based healthcare directly to patients as well as across services as a whole. They could also aid in keeping clinicians up-to-date by providing training and current awareness services. The clinical librarians had been well-received by all involved.

T. Greenhalgh, J. Hughes, C. Humphrey, S. Rogers, D. Swinglehurst and P. Martin\textsuperscript{317} (2002) described and evaluated two different models of a clinical informaticist service. According to authors an informaticist service should be judged on at least two aspects of quality—an academic dimension (the technical quality of the evidence based answers) and a service dimension (the facilitation of questioning behavior and implementation). This study suggested that, while the former might be best achieved within an academic environment, the latter required a developmental approach in which pragmatic service considerations were addressed.

A. Booth, A. Sutton and L. Falzon\textsuperscript{318} (2002) pointed out that the clinical librarian project had a number of significant achievements including contributions to clinical guideline production, individual patient care, continuing professional development and clinical governance, together with risk management.


M. A. Winning and C. A. Beverley319 (2003) made a review build upon the work of Cimpl (Bulletin of the Medical Library Association 1985, vol.73) and attempts to establish the evidence base for CL. The objectives were to determine, from the literature, whether CL services were used by clinicians, had an effect on patient care, and/or clinicians' use of literature in practice and/or were cost-effective. The methodology used was a systematic review of the literature, following, where possible, the NHS Centre for Reviews and Dissemination framework. Modifications to this methodology included the resources searched, and the critical appraisal checklist used. Two hundred and eighty-four unique references were retrieved. Seventeen (16 unique) evaluative and a further 33 descriptive studies met the inclusion criteria. The quality of reporting of the literature was generally poor. CL programmes appear to be well-used and received by clinicians. However, there was insufficient evidence available on their effect on patient care, clinicians' use of literature in practice, and their cost-effectiveness, thus highlighting the need for further high-quality research.

R. M. Sladek, C. Pinnock and P. A. Phillips320 (2004) found in their evaluation that an informationist service is feasible. Results suggested that a pilot could be run in an area of acute medicine where questions about therapy and diagnosis were likely to proliferate, and the informationist should attend consultant ward rounds and clinical meetings, aiming to provide a response within 24 hour.

K. C. Wagner and G. D. Byrd (2004) found that the total amount of research evidence for CML programme effectiveness was not great and most of it was descriptive rather than comparative or analytically qualitative. Standards were needed to consistently evaluate CML or informationist programmes in the future. A carefully structured multi programme study including three to five of the best current programmes was needed to define the true value of these services.

A. L. Weightman and J. Williamson (2005) suggested that professionally led library services had an impact on health outcomes for patients and might lead to time savings for health-care professionals. The available studies varied greatly in quality but the better quality studies also suggested positive impacts. Good practice could be gathered from these studies to guide the development of a pragmatic survey for library services that included the direct effects for patients among the outcome measures.

C. Urquhart, J. Durbin and J. Turner (2005) evaluated the North Wales Clinical Librarian Project. The evaluation showed that most health staff was happy to delegate a proportion of their searching on clinical questions to the clinical librarian. It was difficult to estimate how much time would be saved (as the clinical librarian was likely to do the searches faster, but that type of difference was not measured in the evaluation). The impact of the clinical librarian on the team was also to increase the amount of time spent by health professionals on searching. This was, of course, advantageous to clinical governance in the long term.

A. Brookman, A. Lovell, F. Henwood, and J. Lehmann\textsuperscript{324} (2006) evaluated the CL service at Brighton and discussed the implication of the findings. Internal data suggested that the service was valued by its users and that patient care and continuing professional development were the most common uses for searches (confirmed by the external study); that searches generally result in some change in knowledge; and that this knowledge was disseminated. The external study found that visibility of the CL was crucial to the effectiveness of the role and that clinicians used the service mostly to get access to a wider range of resources and/or to save time. Users wanted the CL to include evaluative annotation with the results, and for the CL role to become more embedded in the team. Interview results expanded on the issues of integration of the CL and the need for annotation of results.

S. L. Maccall\textsuperscript{325} (2006) described and evaluated the use of Clinical Digital Libraries Project (CDLP) digital library collections in terms of their facilitation of timely clinical information seeking. It has been found that the CDLP provided timely access to high quality web clinical resources when used for information seeking in medical education and clinical environments.

C. Urquhart, J. Turner, J. Durbin and J. Ryan\textsuperscript{326} (2007) made eighteen-month evaluation of a clinical librarian project (October 2003–March 2005) conducted in North Wales, UK and assessed the benefits of clinical librarian support to clinical teams, the impact of mediated searching services and the effectiveness of information


skills training, including journal club support. It has been found that collaboration with a clinical librarian increased clinician willingness to seek information. Clinical librarian services should leverage structured training opportunities such as journal clubs.

S. A. Mulvaney, L. Bickman, N. B. Giuse, E. W. Lambert, N. A. Sathe and R. N. Jerome\textsuperscript{327} (2008) found that clinical decision making, particularly regarding treatment issues, was statistically significantly impacted by the Clinical Informatics Consult Service (CICS). Programmes such as the CICS might provide an effective tool for facilitating the integration of research evidence into the management of complex patient care and might foster clinicians’ engagement with the biomedical literature.

S. C. Whitmore, S. F. Grefsheim and J. A. Rankin\textsuperscript{328} (2008) evaluated informationist programme at the Library of the National Institutes of Health (NIH) in Bethesda, MD, USA. High-level, preliminary outcomes were identified from a survey of scientists receiving informationist services, along with key informant interviews. Process evaluation included examination of service implementation, informationists' training and service components. Anecdotal evidence had also indicated a favorable response to the programme. The authors reported that informationists saved time and contributed to teamwork with expert searching and point-of-need instruction.

C. J. Vaughn\textsuperscript{329} (2009) evaluated a new Clinical Medical Librarian (CML) service at Preston Medical Library in Knoxville, Tennessee. The three departments participating


in the service were surveyed and interviewed. Participants in the study shed light on how much impact the attendance of a librarian at rounds and other meetings has had on their patient care decisions as well as their use of the library. Overall, the CML service has been well received by residents and faculty and would continue to serve at least these three departments.

A. Brettle et al.\textsuperscript{330} (2011) undertook a systematic review which examines models of CL services, quality, methods and perspectives of clinical librarian service evaluations. There were four models of clinical library service provision. Clinical librarians were effective in saving health professionals time, providing relevant, useful information and high quality services. Clinical librarians had a positive effect on clinical decision making by contributing to better informed decisions, diagnosis and choice of drug or therapy. The Critical Incident Technique as part of a mixed method approach appeared to offer a useful approach to demonstrating impact.

2.5.8 Clinical Librarianship in India

Vasumathi Sriganesh\textsuperscript{331} (2005) mentioned that clinical librarianship would be a boon to India. If the development of this profession is considered very seriously, it would be a great alternative career opportunity for the thousands of aspiring students who do not get admission to medical colleges, giving them the satisfaction of being in the medical field. And if guidelines and treatment outcomes based on these activities were documented and made available on the web, the resource would be invaluable for doctors across the country. This paper suggested an outline of steps involved for creating and offering a Clinical Librarianship Programme in India.


\textsuperscript{331} Sriganesh, V. (Director) (2005, November 7). Laying a foundation for Clinical Librarianship in India. \textit{The Annual Conference of the Medical Library Association of India 2005}. Lecture conducted from MLAI, Bangalore.
Vasumathi Sriganesh\textsuperscript{332}(2005) discussed the challenges of bridging the gap in information skills searching. These include budgetary constraints, lack of well-trained and or poorly motivated medical librarians, and the absence of the need for accreditation. Some recommendations to tackle these and also to handle the problems of access to full text articles were proposed. The author’s efforts in reaching out to institutions to train professionals were also discussed.

Manoj Kumar Prabha and P. P. Rawat\textsuperscript{333} (2009) described a proposal for clinical librarians in the era of evidence-based healthcare. The authors identified the need of clinical librarians in India. But they thought it was a neglected profession.

\textbf{2.6 Medical Library Education}

Janet Doe\textsuperscript{334} (1949) described the development of medical librarianship as a field of education.

H. Yast\textsuperscript{335} (1964) mentioned that as part of its overall educational programme, the American Hospital Association had since 1959 conducted three institutes on hospital librarianship to meet the demand for more competent librarians in medical, nursing school, and patients' libraries. The purpose of such institutes was to teach the basic elements of library science to untrained personnel in hospital libraries. Steps in initiating an institute; factors determining length, date, and place; financing; publicity; choice and responsibility of local advisory committee; programme content; qualifications of instructors; characteristics of registrants; materials for distribution;

\textsuperscript{332} Sriganesh, V. (2005). OpenMED@NIC - Challenges of bridging the information literacy gap for the practice of Evidence Based Healthcare in India. \textit{OpenMED@NIC -}. Retrieved January 31, 2011, from http://openmed.nic.in/55/ \\
\textsuperscript{333} Kumar, P. M., & Rawat, P. P. (2009). A proposal for clinical librarians in the era of evidence based healthcare, a need but a neglected profession: an experience. \textit{Positioning the Profession} (pp. 1-6). Brisbane: the Tenth International Congress on Medical Librarianship. \\
\textsuperscript{334} Doe, J. (Director) (1949, April 13). The Development of Education For Medical Librarianship. \textit{48th Annual Meeting}. Lecture conducted from Medical Library Association, Texas. \\
evaluations has been discussed. Details of the most recent institute were outlined. A summary of problems still facing this type of educational programme and suggestions for future improvements conclude the paper.

M. H. Libbey\textsuperscript{336} (1967) pointed out that the certification programme was formally adopted by the Medical Library Association in 1948 in an attempt to establish standards for medical librarians. The programme was reviewed, and some of its effects on education for medical librarians were discussed. At the time of its adoption the programme defined the kind of education librarians in the field thought necessary for work in medical libraries. New techniques and a shortage of personnel demand consideration of new educational programmes, and the Medical Library Assistance Act would provide the means for their establishment. The Association should assume leadership in determining what and where these programmes should be and should evaluate its certification and standards programmes as often as current needs require.

In the year 1975, J. D. Key\textsuperscript{337} discussed the health-related sciences programmes of Mayo Foundation, including those related to librarianship, and was conducted in an internationally known center for medical education, clinical practice, and medical research. Students have access to all the educational resources of Mayo Clinic. Appointees to the programmes enjoy the benefits of more than half a century of experience in medical education that includes the training of residents, research fellows, interns, and medical students. The health-related sciences programmes, like the Mayo Graduate School of Medicine and the Mayo Medical School, were part of the Division of Education of the Mayo Foundation, a nonprofit charitable corporation


responsible for the support and conduct of education and research as an integral part of medical and healthcare.

Fred W. Roper\textsuperscript{338} (1979) reviewed the situation in library school education for medical librarianship in the United States and Canada based on information from a questionnaire sent to teachers of courses in medical librarianship in accredited library schools. Since 1939, when the first course devoted entirely to medical librarianship was offered at Columbia University, courses had been introduced into the curricula of at least forty-seven of the ALA-accredited library schools. In 1978 there were seventy courses available through forty-seven library schools. Possibilities for specialization in medical librarianship were examined. Course content was reviewed. Implications of the MLA certification examination for library school courses were explored.

M. R. Al-na’ama, A. M. Alkafajei and G. Joseph\textsuperscript{339} (1980) studied to obtain the students' views on the current system of medical education with focus on training and evaluation in the College of Medicine, University of Basrah, Iraq. The data were gathered by circulation of a questionnaire to students belonging to all the classes. An attempt was made to look for trends in student responses and attitudes over the years. National service, i.e. joining the national healthcare system, appears to be the dominant motive among the first- and second-year students in choosing the profession. Though the practice of general clinical disciplines at the basic doctor's level are preferred, general practice per se does not seem to be popular. An apparent dislike for certain curricular subjects was observed which was more evident among students who had to pass an examination in that subject during the particular year.


Lectures and dictation of notes were rated low. A good majority of students considered their active participation in the learning-teaching process as something highly useful. Though examinations were not generally liked, the students showed their preference for periodical tests as compared to a single annual examination. Students generally did not prefer assessment based on problem solving exercises. Little use was made of the library and there was hardly any student-teacher contact outside the classroom. The study has brought out the need for greater emphasis on self-directed learning. The relevance of the students' views in educational planning was highlighted in the discussion.

J. Sarkis and S. C. Hamburger\textsuperscript{340} (1981) stated a team approach that combines the knowledge and skills of the physician, nurse, clinical pharmacist, clinical medical librarian, etc., into a cooperative unit to provide health education and healthcare delivery. The impact of the clinical medical librarian was also discussed.

Ellen Gay Detlefsen\textsuperscript{341} (1986) offered an analysis of and some predictions for the fields of library education and medical librarianship. The past of education for medical/health sciences librarianship was outlined, with emphasis on the changing nature of the library school, its faculty, and its students. The existing situation was described, with specific reference to faculty, curriculum, and accreditation issues. A future agenda was proposed, identifying the need for interdisciplinary and cooperative efforts within the larger realms of medical informatics, high technology, a variety of health professions, and the community of contemporary library practice.


D. S. Crawford and D. Z. Xiong (1990) described the establishment of faculties of medical library and information science in four of the national medical universities in China. These faculties were established in the mid-1980s and each was fully integrated into its university. Students received three years of non-clinical medical training followed by two years of training in library and information science.

D. G. Schwartz (1995) described the roles and responsibilities of the associate director for medical education at the Primary Care Resource Center (PCRC), School of Medicine and Biomedical Sciences, State University of New York at Buffalo. The PCRC was established to increase the number of UB medical school graduates who selected graduate medical education in the generalist disciplines. The associate director, who was a health sciences librarian, had established collaborative working relationships with primary care physicians in the clinical departments of family medicine, pediatrics, and internal medicine with the goal of improving the teaching effectiveness of faculty and residents. Another goal was to incorporate the use of computerized information technologies into clinical practice by training physicians and residents, at specially equipped ambulatory training sites, in how to access and manage information for the purpose of providing quality medical care. This has been accomplished in part through the provision of highly personalized instruction to participants. In addition to describing these activities, this paper examined how the duties of the associate director reflect the potential for long-term change in the roles and responsibilities of health sciences librarians, whether they work in a traditional or nontraditional setting.


Important organizations in the education of health sciences librarians include graduate schools of library and information science (LIS), the Medical Library Association (MLA), and the National Library of Medicine (NLM).

Linda C. Smith\(^{344}\) (1998) provides an overview of education for health sciences librarianship by considering its development, current status, and possible future evolution. Because health sciences librarians place a strong emphasis on lifelong learning, sections of the paper were devoted to post-master's programmes and continuing education as well as to the master's degree programme in library and information science. Another distinguishing characteristic of health sciences librarianship is the role of the professional association in providing a credentialing programme for its members, now embodied in MLA's Academy of Health Information Professionals (AHIP). Resources useful to the student of health sciences librarian-ship, many of them published by MLA, were listed in an appendix to this paper.

J. Michael Brittain and A. C. Norris\(^{345}\) (2000) gave an overview of education and training in health information management in the context of national information strategies. Although the article focuses upon British programmes, there were examples from North America, Australasia and other countries. Reference was made to international activities in the development of generic courses for education and training, the need for education and training, the content of courses, and methods of delivery, including Internet-based training and education. Governments and health authorities in many countries had recognized the urgent need for a highly educated


and trained workforce in information management, but universities had been slow to respond, until the last few years. However, there was now a plethora of education and training programmes in North America, most European countries, and Australasia.

William Hersh\(^{346}\) (2002) recognized that the growing complexity of health information needs had led to a call for the creation of a new healthcare professional, the informationist. Controversy existed as to the role of such individuals and what their training should be. A library science degree, augmented with clinical background or experience, was one pathway. Another to consider was training in medical informatics. With the right coursework, individuals trained in medical informatics should be equally well qualified to assume the role of informationists.

E. G. Detlefsen\(^{347}\) (2004) described an innovation in MLIS education for medical librarianship, with an introduction to the FastTrack, the distance education programme at the University of Pittsburgh's library and information science school, together with an overview of a model programme linking the biomedical library at Vanderbilt University with the School of Information Sciences in Pittsburgh. Admissions requirements and specific curriculum for the distance education master's degree were detailed in an FAQ format.

Tatjana Petrinic and Christine Urquhart\(^{348}\) (2007) found that structured Continuing Professional Development (CPD) was required to meet the rapidly changing needs in the health sector. The emphasis ought to be on teaching skills, outreach work, marketing and promotion, research skills and methods, subject knowledge and


terminology, and management skills. Library school curricula did not appear to meet the demands of medical library posts. A first degree in scientific subjects was advantageous in the early stages of a career but diminished with continuing training and experience. There was no evidence of a significant difference in training needs and provision between the librarians in NHS posts as opposed to those in higher education posts. The conclusions suggested that library schools need to update their programmes to include teaching skills, advanced search skills, project management skills, and research methods, with more practical exercises. Particular attention should be given to librarians with a first degree in non-scientific subjects in terms of time allocated for CPD, quality of training and access to reliable mentorship.

Greg Rowell and Dean Giustini\(^\text{349}\) (2009) examined the use of constructivist teaching in a course on health librarianship. According to the authors, the use of constructivist approaches in teaching a health librarianship course had proven to be successful.

Vahideh Zarea Gavgani and Farhad Shokraneh\(^\text{350}\) (2011) pointed out the need for content reengineering of the medical library and information science curriculum in Iran. The authors gave emphasis on both basic academic education (background information) and training (on the job training). It has been suggested to create change in the syllabuses of academic medical library and information science education in developing countries in general and Iran in particular to empower and prepare them to play their significant role dissemination of right information to right person at right time, to support patient safety and improvement in healthcare outcomes.


2.7 Observation

A literature review is a body of text that determines the aims to review the critical points of current knowledge including substantive findings as well as theoretical and methodological contributions to a particular topic. It provides a source of research ideas, gives an orientation to what is already known, helps to develop a conceptual framework, indicates as assessment of feasibility and provides information on the research approach to be used. It is an important and integral part of any research effort without which the researcher cannot proceed. The search and review of literature dealing with various aspects of Information Index revealed many useful works such as reports, indexes, data sources, journal articles, books, and web links.

It is found that in this study, 349 literatures were searched and reviewed. The distribution of these literatures reviewed is as follows – 37 works on health sciences librarianship, 26 works on medical librarianship, 31 works on hospital librarianship, 54 works on evidence-based librarianship, 184 works on clinical librarianship and 17 works on medical library education. Here, the researcher observed that the literatures surveyed have different objectives compared to this work. Most related literatures are also not similar with the present research work on the topic titled “Clinical Librarianship in Kolkata with special reference to private hospitals”, where as the related literatures deal with conception of different aspects of healthcare related librarianship. So that this study is different from the point of view of scope and coverage and findings of the other research works surveyed and reviewed and as a result, this research work is unique in nature.