Veterinary Clinical Librarianship

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LIS 690 Independent Study (Clinical Librarianship)

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May 2, 2022

Abstract

The practice of Clinical Librarianship (CL) has been a part of medicine and medical education for over 40 years, and its benefits for students and patients have been empirically demonstrated. Over the years, veterinary medicine and veterinary medical education have adopted innovations and advancements from so-called "human" medicine, but there is little to no research about the effects of CL in a veterinary setting. This paper will review the history and development of CL in human medicine, and provide an assessment of the benefits of CL services, both from an educational perspective and in terms of patient care. After considering a unique veterinary CL program, the paper will make suggestions for future development of veterinary CL.

Introduction

Medical libraries face the particular challenge of connecting their informational resources and professional expertise with users that are thoroughly engaged in the practice of caring for patients, likely in a different building, often working extended hours that may be well outside the operating hours of the library. It is easy for the staff of a medical library to wait passively until they are approached by clinicians, residents, interns, students, or staff with questions. Given the demands on these medical professionals and trainees, there can be many reasons that these questions will go unasked. They may be too busy, they may not know who to ask, or they may not wish to

demonstrate their lack of knowledge in front of their colleagues. The field of Clinical Librarianship (CL) was conceived and developed as a way to bridge this gap, to bring the information and expertise from the medical library into the clinical setting, and to make answering those questions easier.

This paper will briefly outline the history and development of CL, focusing on the origins of the specialty and recent developments in the field. It will survey and discuss research into the demonstrated benefits of CL, in terms of benefits to the medical education of trainees and students and also in terms of benefits to patient care and medical outcomes. The paper will also examine a unique Clinical Veterinary Librarianship (CVL) program.

Finally, this paper will include suggestions for implementing a CVL program that includes a range of clinical activities, as well as a rubric for assessing the program both qualitatively and quantitatively.

History of Clinical Librarianship

The new medical school established at the University of Missouri-Kansas City in 1968 implemented a fairly radical new educational system. Among other innovations; students were accepted directly from high school; the program included an undergraduate liberal arts and a medical degree within six years; and the academic calendar stretched the full year, with no summer break. Most importantly, all students were placed in small groups to be led by an individual physician-instructor called a docent. The docent was the sole instructor for their students, and their teaching was

almost always done bedside, within one of several partner hospitals around the city (Richards et al., 1974). When medical librarian Gertrude Lamb joined the school in 1971, she realized quickly that the innovative teaching model had a crucial gap – team members would have questions or otherwise lack information, and those questions would go unanswered as discussions moved on to other topics and the next patient (Mages & Wheeler, 2020). As Dr. Lamb explained to the Medical Library Association in an oral history, "I just started out saying well now if I'm going to support that kind of educational activity, I'd better find out what it's like. And I went out as a member of the patient care team...And I discovered that all of those team members had information needs and they were never met" (Langman, 2015).

With that in mind, Dr. Lamb developed a program to embed a librarian within the clinical team to attend bedside rounds and provide relevant and reliable medical information as needed. As she described the program in a 1977 article, "a medical librarian is assigned to an inpatient service and attends rounds with the patient care team. The clinical librarian searches current medical literature for answers to questions relating to patient care and management and provides the clinicians on [their] assigned hospital service with relevant articles" (Arcari & Lamb, 1977, p. 18). Beyond simply providing information, the clinical librarian is able to assess potential articles' applicability to the relevant case in a way that the average medical librarian would not be able to (Arcari & Lamb, 1977). Additionally, the clinical librarian's presence on rounds and in other clinical settings means that they can address more general informational needs. "It wasn't so much that we got questions, it was that we anticipated the

information needs" (Mages & Wheeler, 2020, p. 5). The clinical librarian will also develop a unique understanding of the daily life of clinicians, residents, students, and other members of the healthcare team because they are spending so much time with them outside of the library (Mages & Wheeler, 2020).

In 1973, Dr. Lamb left Kansas City to become the director of the Health Sciences Library at Hartford Hospital in Hartford, Connecticut, where she continued to develop the CL concept. Her successor at the University of Missouri - Kansas City – Virginia Algermissen – continued the CL program there, and it would expand to many other medical libraries over the course of the 1970s, from Tufts University in Boston to the University of California - Los Angeles (Cimpl, 1985). The program that Dr. Lamb and the director of the Hartford Hospital Health Science Library, Ralph Arcari, was similar to the program at UMKC. There were four clinical librarians as part of the grant that funded the program, one in the surgery department, one in pediatrics, one in obstetrics, and one in the medicine service (Arcari & Lamb, 1977).

While the goals of the CL program were the same from department to department, the procedures for achieving those goals varied from librarian to librarian. In addition to answering direct questions with relevant articles, one of the clinical librarians developed a weekly publication that included resources that were applicable to patients currently being seen, another provided information that anticipated the department's informational needs in addition to responding to specific requests. A third used a system of attaching relevant information directly to patients' charts, a system that built on the LATCH (Literature Attached To CHarts) system developed at the

University of Washington in the 1960s (Mages & Wheeler, 2020). Dr. Lamb also recognized that clinical librarians needed to have a particular approach to their role in order to be successful. The clinical librarian needs to be a sophisticated researcher, but more than that, the role requires a significant amount of independent interpretation and a more aggressive approach to the reference interview, asking questions and talking to their interviewee in depth (Mages & Wheeler, 2020). The clinical librarian also needs a certain personality. "they have to be bright, and they have to be curious. And they have to have...a very strong service orientation and then a pretty sturdy ego, because there's an awful lot of what I began to call 'brutal friendliness' out on the patient floor" (Langman, 2015).

As the CL concept spread to other institutions, it would be subtly modified to suit the particular needs and goals of those institutions. The McMaster University Medical Centre (MUMC) in Hamilton, Ontario, developed a program that had two important differences from UMKC and Hartford. Firstly, the service was directed specifically at non-physician members of the health care team, under the assumption that the learning benefits for non-physicians would be equal to, if not greater than, the potential benefits to doctors. This team-focused approach also served to emphasize MUMC's overall team-based approach to patient care. Secondly, the service was made available to patients and their families. This allowed for patients to consider a medical procedure from a more informed perspective, and allowed them to generally participate more knowledgeably in their own health care (Marshall & Hamilton, 1978). The Orthopedic Surgery Department at Beth Israel Hospital in Boston, Massachusetts – a teaching

hospital of Harvard University – developed its own in-house CL program. Called the Clinical Information System, the program included "(1) an automated clinical file; (2) a clinical librarian service; (3) a departmental library; (4) educational materials for orthopaedic patients; and (5) assistance in manuscript preparation" (White et al., 1980). Also in the Boston area, a consortium of three community hospitals created an evolution of the LATCH system paired with CL called the Patient Care Related Reading (PCRR) program. PCRR consisted of a set of preselected articles, selected by librarians and screened by physicians, that would be routinely attached to patients' charts, based on their clinical problems. Packets covered topics like fever of unknown origin, diagnosis and treatment of pneumonia, and urinary tract infection. While not as responsive or as interactive as a "traditional" CL program, PCRR still resulted in increased visibility of librarians within the hospital setting and reinforced the concept of the hospital library as an active part of the clinical team (Hutchinson et al., 1981).

The 1980s and 1990s was a much slower period of growth for CL programs across the country. In contrast to the nineteen CL programs that began between 1974 and 1985, only six additional programs were created between 1985 and 1993 (Schacher, 2001). Budget and staffing cuts throughout the 1980s were also a factor. At the Medical College of Virginia Campus of Virginia Commonwealth University, for example, a successful CL program that began in 1977 was disbanded in 1983 due to its cost (Turman et al., 1997).

In the late 1990s, there was a push to evolve the practice of CL into a more active participant in the health care team. In an editorial in the Bulletin of the Medical Library

Association, Nunzia Giuse (1997) called for clinical librarians to abandon their role "as information 'servers' who trail the team in an auxiliary capacity but as an integral part of the group with a specialized expertise that can contribute vitally to clinical situations" (p.437). Giuse envisions clinical librarians presenting their findings and research verbally, during rounds, in order to increase understanding, but primarily to build trust in the information they are providing. Guise (an M.D. and M.L.S. herself) further suggested that clinical librarians should increase their clinical training with medical and nursing school classes and the concepts and practices of evidence-based medicine.

Shortly thereafter, Frank Davidoff and Valerie Florance called for the creation of a new type of medical professional, closely mirroring the model proposed by Giuse, that they suggested be called "informationists". They outlined four principles to guide this new profession. First, informationists would be formally trained in both clinical medicine and information science. Second, informationists would need to spend time in a supervised practicum. Third, they called for national certification and accreditation of informationists and informationist training programs. Finally, they acknowledge that in order for informationists to be accepted and trusted, they should be employed directly by the hospital and report to clinical directors or chiefs of staff (Davidoff & Florance, 2000).

In the twenty years since it was proposed, the informationist profession has flourished. The National Institutes of Health have an informationist program that includes fifteen informationists working with over 40 teams (DeRosa & Martin, 2018). The basic concept of the clinical informationist—a librarian who combines information

science knowledge with practical, domain-specific experience—has been extended to create the field of research informationists (Federer, 2014) and informationists that work in non-clinical educational settings (Tmanova et al., 2015). More recently, a core competency model (Hashemian et al., 2021) has been proposed that attempts to identify the specific skills and practices that informationists need to obtain during their education and training.

Benefits of Clinical Librarianship

The question of how to assess the services that clinical librarians (and informationists) provide has been a part of the professional literature from the start. Researchers have been considering how to assess CL since the 1970s. Gertrude Lamb began by looking at the number of "impact documents" provided, but wondered how to account for information that did not "impact" the care of a current patient, but might impact a patient that the same clinician might treat weeks or months later (Mages & Wheeler, 2020). Scura and Davidoff (1981) used a simple critical incident technique assessment model, asking residents who used the CL service at the University of Connecticut Health Center if the articles that had been provided impacted their patient care decisions.

More recently, researchers have been assessing the impact of clinical librarians and informationists from a more quantitative perspective. Grefsheim *et al.* (2010) examined the effect of informationists on the information-seeking behaviors of clinical research teams. The study, carried out at the NIH, used focus groups and two surveys

(a baseline survey and a follow-up). The study asked survey participants about how and where they looked for answers to clinical questions, as well as their impressions of the informationist service at the NIH facility. The study found that after working with the informationist service for two years, participants were more likely to seek answers to their questions, and were more willing to spend time investigating those answers. Additionally, respondents used a greater range of informational resources after working with informationists, with use of Web of Science and the Cochrane database doubling over the study period.

Brian *et al.* (2018) investigated the quantitative and qualitative impact of a clinical librarian on clinical questions asked during rounds. The observational study was carried out at University of Chicago Medicine, and recorded the number, type, and quality of questions asked during internal medicine and pediatric rounds. The observations were taken with and without clinical librarians present, so that any differences could be identified. The study demonstrated significantly more questions were asked when a clinical librarian was present, and the questions were of higher quality (more likely to contain all four components of PICO). A survey asked participants in the study about their experience with a clinical librarian on rounds. Seventy-four percent felt that the presence of the clinical librarian "increased the relevance of the questions they asked" (p. 180).

A common metric for assessing the performance of a CL program is to look at how the information provided affects patient care decisions by the physicians that are working with clinical librarians. A landmark example of this is the "Rochester study"

(Marshall, 1992), and a similar, updated study twenty years later (Marshall et al., 2013), though these studies looked more generally at the benefits of medical librarianship, rather than focusing specifically on the effect of CL.The results are applicable to clinical librarianship, since they indicate the effects of receiving relevant medical literature about patients being treated. The earlier study asked physicians from fifteen hospitals from around Rochester, New York to request some information related to a current clinical case, and then to complete a survey to evaluate the impact of that information on patient care decisions. Eighty percent of the responding physicians changed aspects of how they handled this particular case. Additionally, respondents rated information provided by their libraries higher than other information sources like imaging and lab tests. The later version of the study targeted additional members of the healthcare team, like residents and nurses. In this study, a critical incident technique was used. A survey asked the respondent to remember "an occasion in the last six months when you looked for information for patient care that was not available in the patient record, electronic medical record (EMR) system, or lab results" (p. 39). The study then asked a number of questions about the patient, the information resource consulted, and the contribution of librarians to their search. With over 10,000 responses, ¾ of the responses demonstrated that the information found positively impacted patient care, including avoidance of adverse events, and again, the importance of informational resources was considered more important than information from diagnostic imaging or laboratory testing.

Shelagh Mulvaney *et al*. also investigated the impact of information on decision-making regarding patient care, this time specifically determining the effectiveness of an informationist consult service at Vanderbilt University (Mulvaney et al., 2008). The randomized trial selected certain clinician requests to receive a consultation with the library's Clinical Informatics Consult Service (CICS), and used a survey to determine if such a consultation had an impact on the clinician's decision-making process, as well as an "Action Index" to quantify effects on patient care. The greatest impacts were in satisfaction with the search process and time spent searching, but the presence of a consult also increased the Action Index and suggested that the results of the consult would continue to impact the physician's treatment of future patients (to some extent answering Gertrude Lamb's question of 40 years earlier, when she wondered how to measure the future impact of her clinical librarian program at UMKC).

One of the few studies to examine the medical effects of CL was carried out on patients seen at Louisiana State University Health Sciences Center in Shreveport in 2004 and 2005. After specific cases were presented at morning rounds, articles were selected by librarians, with the guidance of department chairs and chief residents, that were particularly relevant and clinically sound in their answers to questions posed at morning rounds. These presented cases were matched to a control group, and three outcome measures were tracked: length of stay, charges for hospitalization, and readmission rate. There were no statistically significant differences in readmission rate or charges,although there did appear to be a slight savings for the experimental group.

There was a significant reduction in length of stay for the experimental group ($P < 0.024$), but given the small sample size (only 55 cases were able to be adequately matched to controls) it is hard to adequately explain why the benefits were limited to that particular outcome (Banks et al., 2007).

There have been several systematic reviews of CL carried out, most recently by Brettle *et al.* (2011) and Perrier *et al.* (2014). Brettle *et al.* identified 18 studies for inclusion, and grouped them into four models of CL services. They divide the studies into a "Question and Answer" approach, in which clinicians reach out to librarians with specific questions and an "Outreach" approach, which involves librarians pro-actively engaging clinicians. Adding a "Critical Appraisal" component to those two approaches—in which librarians not only provide informational resources, but also attempt to summarize or synthesize the available information—form the four models identified. They note that the "Outreach + Critical Appraisal" model matches the informationist role as defined by Davidoff and Florance (2000). This review further noted that existing studies used such a wide range of outcome measures that it is hard to make conclusions about the impacts of CL. Several of the studies included in this review, for example, measured usage of the CL service in question, and did not actually measure effectiveness or impact. The review is able to conclude that clinical librarians "are effective in saving health professionals time, and the results of literature searches provided are relevant and useful, indicating that clinicians are happy with the quality of the services" (p. 20). Additionally, the review notes the positive move towards using critical incident technique (CIT) to collect data. Especially if the CIT evaluation is

conducted after the clinical event, it will enable clinicians to specify how the information was actually used, rather than how it was intended to be used.

The Perrier *et al.* systematic review, which reviewed 25 articles, included an in-depth quality appraisal of those studies, using a risk-of-bias tool and other quality assessment models. The review found statistically significant evidence that CL services that include a search skills training component provide a positive impact to participants' search skills, which increases the likelihood that research evidence will be incorporated into patient care decisions. Additionally, those increased search skills, as well as searches provided by librarians directly, represent a significant savings of time that can translate directly into treating more patients (Perrier et al., 2014).

Clinical Veterinary Librarianship

While the informational needs and information-seeking behaviors in veterinary medicine have many commonalities with those in human medicine, there are obvious, significant, differences. Many veterinarians treat multiple species, whether cats and dogs in small animal medicine, horses and cattle in large animal medicine, or everything from hamsters to snakes in exotic animal medicine. Despite this requirement to manage additional information, veterinary professionals are at a disadvantage compared to their counterparts in human medicine, in that there is no prominent clinical knowledge management (CKM) system in veterinary medicine. CKM software like DynaMed, Micromedex, UpToDate and more have been demonstrated to improve clinicians' information-seeking behaviors and to lead to better patient outcomes (Maggio et al.,

2019), but in a recent study, veterinary students, residents, and graduates rely on a wide range of informational resources, from class notes and non-veterinary search engines to textbooks and journal articles (Garner et al., 2019).

All of the schools of veterinary medicine that are accredited by the American Veterinary Medicine Association are required to be served by a professional library, providing access to informational resources and trained professionals (*Accreditation Policies and Procedures of the AVMA Council on Education*, 2021). The first formal survey of veterinary libraries was conducted in 1964, in order to assist the planning of a veterinary library at Kansas State University. At the time, the fifteen libraries responding to the survey held an average of 11,062 volumes and subscribed to an average of 312 periodicals. Their budgets ranged from $22,000 to $1,000 per year, and they offered between 158 and 26 seats (Fadenrecht, 1964). In comparison, a 2001 survey showed a mean of 44,589 volumes and a mean annual budget of over $350,000 (Kok et al., 2002).

Despite the challenges inherent to veterinary knowledge management, and the requirement for veterinary schools to be adequately supported by a library, there is little evidence of Clinical Veterinary Librarianship (CVL) programs and no research into their effectiveness or impact. The only school of veterinary medicine that appears to have created a CVL program is Texas A&M University. Established in 1980 as a direct response to the success of CL programs in human hospitals (Guidry, 1980), the program began with the Small Animal Clinic. Demonstrating some evidence for the program's initial success, it was expanded in 1982 to include the Large Animal Clinic (Thomas, 1983). The primary activity of the CVL program is attending rounds. Rounds in an

animal hospital differ from rounds in a human hospital, in that they are generally not performed on the patient care ward, but in a more classroom-like setting, but just like CL programs in human hospitals, the CVL program at Texas A&M largely involves answering questions that arise in rounds by searching the literature and providing a selection of appraised articles and papers to answer the pertinent questions. An additional goal of the CVL program is promotional. The program hopes to increase recognition of the library and its librarians as important members of the educational mission of the college by increasing the prominence of librarians and library resources within the hospital setting (Thomas, 1983; Olmstadt et al., 2001). In the first two years of the program, 65 requests were processed (Thomas, 1983), but by 2000, the program was answering 252 questions per year (Olmstadt et al., 2001). Unfortunately, neither Thomas (1983) nor Olmstadt *et al.* (2001) performed any assessment of the impact of Texas A&M's unique CVL program, though both writers note the subjective value of the program, both to the library itself in terms of visibility, and to the educational growth of the students, residents, and faculty.

Proposal

Plan

Libraries that serve colleges and schools of veterinary medicine that include an onsite teaching hospital should consider piloting a CVL program, ideally one that includes, from the outset, a rubric for assessing the impact of the program across

different aspects of the hospital. Traditionally, CL programs, especially in the Informationist model, have focused almost exclusively on the single activity of attending rounds and answering clinical questions, but by diversifying the activities of the clinical librarian, the program can find (and demonstrate) success in a range of modalities.

The traditional CL activity of attending rounds should clearly be a part of this hypothetical CVL program. It is hard to imagine applying the "clinical librarianship" name to a program that does not include this aspect. Olmstadt (2001) notes that future plans for the Texas A&M program include "providing information at the point of care in the clinics" (p. 396) and with the modern ubiquity of portable computers and wireless networks this can easily be achieved. As we have seen in the wide range of CL programs, the means of delivering the acquired information may vary. The implementation of a CVL program should include some discussion with clinicians and other members of the veterinary team to determine how best to provide these answers to clinical questions.

Another activity that could benefit the library and the hospital would be for the clinical veterinary librarian to keep regular "clinical office hours" within the hospital. It is easy for busy clinicians to focus on the cases piling up in front of them and not consider the resources represented by the veterinary medical library, whether it is across campus or right next door. By maintaining a presence within the hospital, the CVL program may inspire additional clinical questions or other avenues for partnership. These hours should be conducted in a highly visible and centralized location - a rounds room, a break

room, or even on the ward - to make sure the librarian is top of mind when a question arises.

A CVL program should also consider offering more traditional library instruction, but within the hospital context. Workshops on subjects like search techniques, citation management, organizing grant applications, bibliometrics, and more would be easier for hospital staff to attend when they are offered in the hospital. Additionally, spending time within the hospital will allow the clinical veterinary librarians to obtain a better sense of what times and duration these sessions should be, whether shorter lunchtime sessions, longer early morning sessions or something else entirely.

The final activity that should be included in a CVL program is an active collection development mindset. The additional exposure to hospital staff, from faculty clinicians to technicians will educate the librarian on the resources that get used in the hospital and the types of resources - especially electronic or web-based resources that are accessible at a moment's notice.

Assessment

The primary mode of assessment of this program would be simply quantitative. Counting the number of questions answered, the number of articles provided, the quantity of office hours provided, the number of consultations provided during those hours, workshops conducted, new resources purchased, etc. In addition, the program can and should be assessed from a more qualitative perspective. This can be accomplished via surveys or focus groups. Using the Critical Incident Technique (CIT) can be an effective way of gathering relevant qualitative data. In the CIT model,

respondents are asked to recall a specific incident and discuss its impact. The primary benefit of this technique is that the interviewee is providing facts about a specific event, rather than overall impressions and opinions (Flanagan, 1954).

A crucial question regarding the assessment of a CVL program is whether or not to assess the impact of CVL on medical outcomes. Ultimately, the field of medical librarianship must determine if a well-staffed and effective clinical librarianship program can have a positive impact on the patients being treated. If studies can eventually demonstrate that CL can reduce a patient's length of stay, or the charges they incur, they will be considered essential. Unfortunately, developing an acceptable level of significant correlation is an enormous endeavor that will require an extensive team of clinicians, statisticians, medical records specialists, librarians, and more. This level of evidence is not realistic for a pilot project in CVL to obtain. In the interest of creating a program that is reasonable for a veterinary medicine library to implement, demonstrating an impact on medical outcomes should be held for the future.

Conclusion

Clinical librarianship is an important and effective aspect of medical librarianship, and can and should be a part of the work of any library of veterinary medicine. The opportunities for research are significant, and given the potential—though as-yet unproven—benefits for the health of veterinary patients, should be investigated as thoroughly as possible.

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