

Agony and Ecstasy: The Transformation of the Academic Health Sciences Library

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The health care environment is under increasing pressure to deliver better quality of care while simultaneously reducing costs. From a global perspective this might not appear directly related to academic health sciences libraries. However, it is at the foundation of the angst permeating the profession. As a concrete indicator of the impact of this pressure on libraries over the past five years, academic health sciences libraries have witnessed substantive budget reductions and loss of personnel across the nation (Association of Academic Health Sciences Libraries, 2007; Association of Academic Health Sciences Libraries, 2011).

Other factors have led to this current state, including the perceptions that knowledge is becoming more freely available over the Web, librarians are no longer needed as expert searchers, and the academic health care environment has more need for specialized knowledge managers in research and clinical decision support than the generalists currently being trained in library schools. This has resulted in many institutions questioning whether or not the money put into the library cost center might better be directed towards more specialty trained knowledge managers.

High quality information continues to be in demand. Considering that medicine is one of the most information intensive professions, health care depends on having the right information at the right time, whether that information is critical knowledge about the patient or the evidence necessary to make an informed decision relative to the patient's condition. However, as health care becomes more specialized and the body of medical knowledge grows, it is impossible for the

health care provider to know what is important at any given time and it is impossible for the medical librarian to hope to assist the individual provider without the breadth of understanding of the patient's condition and how that relates to the evidence base.

Computers in medical practice are becoming more ubiquitous, particularly as the HITECH Act has moved forward with the demand for meaningful use of electronic health records (EHRs) (Blumenthal, 2010). Decision support utilities are central to meaningful use, and these are not created easily. Use of IBM's supercomputer, Watson, has recently been purchased by WellPoint, Inc. as a trial to improve health care in a variety of different venues by linking patient data to information contained in journal articles, texts, and high quality decision support utilities (Mathews, 2011).

The idea of coupling patient data with evidence is not new and is seeing a resurgence because of the need to reduce medical errors and health care costs (Weed & Weed, 2011). So where does this leave academic health sciences libraries, the traditional source for high quality health information? The obvious answer would be in a precarious position. However, in exploring the ways that library skills impact the utilities that support quality health care decision making, the future becomes brighter. Following is an analysis of the direction that academic health sciences libraries need to take when considering the full spectrum of academic medicine and the tools librarians will need to achieve their potential in this brave new world of high tech medicine.

New Models for Academic Health Sciences Libraries

There have been several seminal papers written over the past decade about the future of health sciences librarianship. The first of these was a paper by Davidoff and Florence (2000) introducing a new profession of Clinical Informationist to mitigate the problems with knowledge management happening during the patient care encounter. This professional would possess both the core information management skills of the librarian and also a deep understanding of the medical profession. Persons ideally suited to this would be clinicians who sought library degrees or librarians who became certified in one of the health professions.

Two years later the Medical Library Association convened an Informationist conference with the National Library of Medicine and added the concept of Research Informationist as a second new type of professional, mixing library skills with a detailed knowledge of one or more of the research disciplines (Shipman, Cunningham, Holst, & Watson, 2002). Both of these articles called for additional credentialing and/or degrees for librarians as a precursor to clinical or research collegiality, particularly in academic medicine where the doctorate is sacrosanct.

Lindberg and Humphreys (2005) took this concept one step further in a 2005 *New England Journal of Medicine* article in which they posited that the academic health sciences library of the future would be electronic and, although there was need for a physical presence for gathering, it would not have books or journals nor would it provide reference services in the most traditional sense. The new Informationists would be embedded in their respective departments to serve as part of clinical or research teams while high level paraprofessionals would manage the collections and other library services.

Many academic health sciences libraries today have begun this evolution. In a recent survey *Indiana Libraries, Vol. 31, Number 1*

of directors of academic health sciences libraries in the U.S. and Canada, of the 58% who responded, 100% stated that they purchased electronic journal access although only about half provided backfile access in that venue and only 26% purchased e-book access. There has also been a notable trend in moving away from having librarians manage either technical or access services departments (McGowan, 2012).

New Roles for Academic Health Sciences Librarians

While there seems to be a reduction of professional librarians in the more traditional service areas there is an incremental increase in professional librarians, albeit with a growing number possessing additional academic credentials, taking part in the four cornerstones of academic medicine, teaching, research, clinical service, and professional service, in the form of knowledge management. With the requirements to link electronic articles to disparate bibliographic databases and to find obscure publications for document delivery and interlibrary loan, paraprofessionals must be trained or have traditional library degrees to insure the necessary levels of competencies in these critical areas. This raises the question of whether or not there should be two types of professional librarians in academic health sciences library, those who provide more traditional library support services and those who are more actively involved in traditional faculty roles.

Teaching

Academic health sciences librarians have had an active role in teaching search strategies to medical students since MEDLINE, primary bibliographic database of medicine, became an end user's tool (McGowan, Passiment, & Hoffman, 2007). More recently, they have become involved with evidence-based medicine (EBM) courses, a content area that teaches medical students to critically analyze the articles to ensure that they obtain the best evidence for the patient care problem. However, even EBM tends to be an extension

of an old paradigm, and the roles of many librarians in this content area tend to be more of teaching identification and access skills rather than teaching the analysis competency.

There are a number of teaching opportunities that most academic health sciences librarians have not pursued but which fall into areas of critical importance to the next generation of both clinical practice and translational research. These include the need to inform future researchers about the knowledge-based tools that are available from both national and global sources and to teach not only their use but also how they can be efficiently and effectively linked into local databases to improve decision support and create new knowledge.

In clinical practice, with the mandate for meaningful use of EHRs, librarians have a unique opportunity to own the teaching content of linking decision support (knowledge-based) components of the EHRs to patient care – when to use alerts and how to insure that knowledge questions are answered when they could have a noticeable impact on patient safety and quality of care. In addition, librarians generally have exceptional organizational management skills and have the opportunity to teach/disseminate knowledge about quality improvement projects and other similar process activities that are critical in today's health care environment.

Although falling outside of the more traditional teaching of health sciences students, librarians also have a major opportunity to participate in any patient care project that focuses on therapy compliance or patient decision-making that requires improved health information literacy. Librarians are in a distinctive position to work with patients in helping them understand information on which they need to base their health care choices.

Research

Academic health sciences librarians have generally focused their efforts on supporting research projects within their institutions

through providing high quality literature searches. However, with the dramatic change in the preferred sources of research knowledge, even this traditional service role is being lessened. Cancer researchers tend to rely on the Cancer Biomedical Informatics Grid® (CABig) while the proteomics and genomics researchers rely on Entrez and many similar knowledge sources, bypassing the refereed journal literature. Since the National Institutes of Health (NIH) requiring all grant supported research data be made freely available, this trend will grow towards access to primary source data rather than published analysis of data, even if it is in a highly respected refereed journal.

Again, librarians have a unique opportunity to become knowledge leaders in research projects, but to move into that area, as with the Research Informationist, a subject specific second master's degree or a Ph.D. is generally a prerequisite. There are some notable examples of dual degreed academic health sciences librarians who are part of research departments and actively participant on research grants as investigators in their own right. However, this type of individual is currently rare and some academic health sciences libraries are hiring Ph.D.s without the master's degree in library science and training them as information managers to fill a critical need in their institutions (McGowan, 2012).

There are some areas that do not require the advanced degree but rather the ability to expand the definition of the types of information needed in academic medical centers. These require the ability to span boundaries but could have a significant impact on both the profession and the institution. Again, knowledge of the information needed is critical and this could be gleaned from a librarian embedded in a department or even a major institute who "researches" information problems and offers potential solutions. Examples include finding the best reagent to facilitate an experiment, mining major local, regional, or national data and knowledge bases to discover new relationships among disparate entities, or linking databases with knowledge

bases to create decision support tools. None of these falls into the traditional expert searcher definition, but they are all important to the research and clinical enterprise and offer new roles for librarians willing to move outside the physical and virtual library space.

Clinical Service

Ten years after the first Informationist article was published, Davidoff and Miglus (2011) called for building an information system to deliver evidence-based medicine. The information system they discussed was an organizational construct in which the informationist would be part of the health care team. However, there is a tension between the information system optimally being an organization or a technology. Dr. Lawrence Weed in his recent monograph stated that "Patient data must be systematically linked to medical knowledge in a combinatorial manner, *before* the exercise of clinical judgement..." (Weed & Weed, 2011, p. x) suggesting a framework that includes both the data found in the electronic health record and the knowledge parsed from the peer reviewed literature. While the clinical Informationist has a place in today's health care environment, there is some question as to whether or not this position will remain viable if technology enables this linking automatically. When this happens, the unique patient will not fall victim to Bayesian based decision support systems which suggest the most common diagnosis or management for the condition rather than taking all of the individual patient data into account. Again, this can open unique opportunities for academic health sciences librarians willing to transform their role in providing clinical information support to health care providers.

Rather than supporting the individual provider, librarians are critically important to searching the peer reviewed literature and finding unique factoids of information that can become critical elements in a massive knowledge network. This network in turn is requisite to supporting the type of clinical decision making assistance that will ensure the most appropriate diagnosis or management of the individual patient, whether delivered by Watson or some other

computer system (Mathews, 2011).

In addition to helping to create the next generation of EHR-linked decision support tools, academic health sciences librarians are uniquely positioned to teach the use of these tools, thus bringing the information roles full circle with the aim of best patient care practices. In this way, academic health sciences librarians will become essential to the next generation of the academic medical enterprise.

Professional Service

Professional service has been considered the fourth cornerstone of academic medicine although it has not been perceived as important as the first three. In many institutions, academic health sciences librarians have frequently viewed service on institutional committees or service in their professional associations as a way to validate their contributions. While this type of service is important, it is generally not considered as a measure of success within the institution. However, many librarians continue to build their vitae around the numbers of committees on which they serve.

To ensure that professional service is valued, again, a new way of looking at the concept is necessary. Academic health sciences librarians possess a great deal of skill in knowledge management and the academic medical center has significant needs in high quality knowledge management. Translational and transformative sciences initiatives that cross basic and clinical sciences and push new therapies into the community have substantive needs for information management using social networking tools, creating utilities to evaluate new forms of research, and capturing tacit knowledge to facilitate the creation of new hypotheses leading to innovation.

The next generation of knowledge management must also involve the entire academic medical enterprise and assist in capturing its knowledge capital and helping it to grow. Again, this is an area in which academic health sciences librarians can be

actively involved and help support the true learning organization fostered on access to and creation of knowledge essential for the health care community.

Threat Assessment

While there are many opportunities for academic health sciences libraries and librarians to transform themselves within a new domain of knowledge management, being able to successfully accomplish this will not be easy. There are a number of perceived threats that will inhibit rapid advancement into a new and more viable profession.

Many middle and older generation librarians pursued a library degree because they loved books and envisioned that they could make substantial contributions by providing essential information to others through retrieval and dissemination, capture and control, and creation of knowledge. The work done by these librarians has been substantial and has made major contributions to health care. However, new tools have been developed and new organizational models have been created that put the current paradigm of academic health sciences libraries at risk and threaten many of these librarians.

Results of semi-structured interviews done in conjunction with the survey of academic health sciences library directors indicated that the characteristic of librarians most valued to move the profession forward was a "willingness to be proactive and innovative in seeking opportunities outside of conventional library roles" (McGowan, 2012, p. 45). Lack of librarian tenure was considered an asset for those library directors who had been able to rapidly convert from a traditional medical library to one far more responsive to the needs of the dynamic academic medical center. Many directors also noted that recent hires, particularly those with dual degrees or National Library of Medicine Fellowships, were embracing the new models and providing thought leadership for the next generation of academic health sciences knowledge managers.

What does this mean for academic health sciences librarians who are reluctant to give up their traditional work and embrace new forms of knowledge discovery and dissemination? For those with tenure there is a degree of protection but at the potential expense of their libraries. With more and more academic medical centers rewarding departments, including their libraries, based on the quality of their work products, even the perception that the professional librarians are not contributing to the mission of the institution while being able to demonstrate a positive return on investment could lead to reduction in funding and, concomitantly, staff.

Conclusion

Academic health sciences libraries are at a watershed period. They are under an increasing mandate to demonstrate their value beyond the accreditation requirement for the health professions schools. The move to electronic, aggregated collections and the re-engineering of former library space into classrooms and research labs have resulted in a loss of identity. Clients no longer come to the library for information that is available in their labs or clinics and even the formats of needed knowledge is changing. Academic health sciences libraries are agonizing over change.

However, these same libraries have exciting opportunities and wonderful challenges to re-engineer themselves into the knowledge centers of the future and the trusted source of knowledge management for their institutions. Academic health sciences librarians, by expanding their views of knowledge curation, communication and creation, and their roles in these activities that embrace the needs of their institutions, can experience the ecstasy of renaissance as essential and transformational team members in the new academic health sciences environment.

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Bio

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