

# Role of expert searching in health sciences libraries

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## INTRODUCTION

The nation's health sciences librarians must continue to play a significant role in the expert retrieval and evaluation of information in support of knowledge- and evidence-based clinical, scientific, and administrative decision making at all health institutions. The nation's health sciences librarians also have a responsibility to train future health sciences practitioners and other end users in the best retrieval methods for knowledge-based practice, research, and lifelong learning and to help them identify which information needs should be addressed by expert searchers.

This policy statement:

- defines expert searching and provides the background on the issue;
- articulates the role of health sciences librarians in the provision of expert searching; and
- identifies a number of high-impact areas in which consultation and expert searching are critical to the success of the institution.

## DEFINITION OF EXPERT SEARCHING

Expert searching in the context of this policy document is a mediated process in which a user with an information need seeks consultation and assistance from a recognized expert. The recognized expert performs a search that is the combined and synergistic application of the following key skills and knowledge:

- ability to accurately identify an information need through effective personal interaction and to clarify and refine the need and retrieval requirements;
- subject domain knowledge and sensitivity to the professional information within the domain to place an information need in the context of a discipline or practice;
- ability to perceive the implications of the information need through relevant institutional knowledge and placement of a request in the context and mission of the institution;
- ability to identify and search resources beyond the electronically available published literature, including the older published literature, gray literature, unpublished information, and Web documents;
- ability to recognize personal searcher limitations related to subject domain or resource specificity as well as the limitations of available institutional resources;
- knowledge of database subject content, indexing or metadata conventions, and online record format to determine relevance to the information need and the method of retrieval access;
- expert knowledge of retrieval system interfaces to determine appropriateness of one interface over another;
- expert application of retrieval system logical, positional, and weighting capabilities;
- ability to be mindful and reflective; to think about and observe what is being retrieved through the use

of an iterative and heuristic search process for discovery of relevant evidence;

- ability to use both deductive and inductive reasoning combined with subject domain knowledge to respond to a desired outcome, not necessarily to a literal request;
- ability to efficiently and effectively evaluate retrieved evidence to determine closeness of fit to requestor's recall and precision requirements, expectations, or subject domain familiarity;
- ability to expertly process retrieval for results presentation through removal of irrelevant material from search results, application of data mining techniques to identify themes and gaps in retrieved information, and performance of other editing procedures aimed at optimizing and economizing the subsequent work by the end user; and
- ability to effectively document the search process for end-user information or retention for legal purposes.

Health care professionals and biomedical research personnel generally do not have this combined set of skills and knowledge. It remains the province of highly trained and experienced librarians and is applicable to other important areas requiring expert consultation and training such as:

1. provision of expert consultation to end-user searchers;
2. design of online searching education programs;
3. provision of expert consultation for a health care informatics application;
4. provision of the highly specialized services such as clinical medical librarian programs or clinical or research information specialist in context programs;
5. design of gold-standard searches and expert "hedgies" for use by colleagues and end users; and
6. design of expert searching continuing education courses or other peer-to-peer education opportunities.

## BACKGROUND

From its beginnings in the late 1960s through the middle of the 1980s, computer-based searching was nearly the exclusive province of medical librarians specially trained in this skill. Training included not only instruction in the somewhat arcane syntax of the command-based language, but, more importantly, a thorough grounding in the knowledge of the specialized subject headings used in the databases themselves and the policies that governed the application, manipulation, and coordination of the individual data fields. Although the National Library of Medicine's MEDLINE database was often the first database with which medical librarians became familiar, they were able to transfer their searching skills and analytic expertise to other databases that soon became available via commercial vendors or via internal computer systems. The formal online training programs sponsored by NLM also served as a form of credentialing system for medical librarians responsible for providing mediated subject

searches at their respective institutions. During this early period, physicians, researchers, and students who wished to take advantage of the power and convenience of computer searching were in most cases required to consult a trained librarian. The librarian's responsibility was to refine and clarify an initial research or clinical issue so that it could be effectively translated into the language and logic of a retrieval system. The process of refinement and clarification was repeated as often as necessary to achieve useful search results and could involve the active participation of the researcher or clinician during the search planning and online interaction phase.

Searching performed by trained librarians at academic institutions, including the nation's academic health center (AHC) libraries, was supplanted quickly in the late 1980s by end-user searching as database vendors developed user-friendly search interfaces. The number of online searches increased tremendously, first, as a result of this welcoming user-friendly environment and, second, as the databases themselves became readily available over the Internet. In this new environment, the role of the academic medical librarian in the online retrieval process was transformed from that of trained mediated searcher to online instructor and consultant. Many of the nation's hospital libraries have continued to offer expert literature search services, as well as clinical medical librarian services requiring expert literature searches, and have become online instructors and literature consultants to assist end-user searching demands.

### LIBRARIAN'S ROLE TRANSFORMED

The transformation from expert searcher to consultant and online instructor has had both positive and negative aspects. On the positive side, the ubiquity of databases on the Internet and the ease of searching make online searching convenient and efficient for many end users. Highly trained librarians are no longer required as intermediaries for straightforward searches that can be done effectively by end-user searchers; on the other hand, the results obtained by untrained or unsophisticated end-user searchers in the present environment are often of questionable quality at best and dangerous at worst. End-user searchers unfamiliar with a subject domain will not be able to determine what relevant references have been missed or whether they have retrieved the most relevant and accurate information to answer their information need. In some cases, less than expert searching is quite acceptable to end users who only want a few recent references or who are looking for a key citation. On the negative side, librarians who are not required to perform expert searches or expert consultation soon lose the knowledgebase and skill sets required if these skills are not exercised in other ways, such as support of in-depth reference questions requiring literature research, database collection development, and curriculum support. The end-user driven Web and Internet provide end-user searchers with the illusion that they can find anything, even in

the gated and highly structured resources so familiar to librarians.

Recently, the increased emphasis on evidence-based practice by the Institute of Medicine has created a renewed interest in the knowledgebase and skill set required for expert literature searching and expert consultation. Librarians are being recruited to join clinical and research teams as clinical medical librarians and information specialists in context and to provide expert consultation on issues ranging from informatics literacy to evidence-based medicine classes. All require the same knowledgebase and skill set identified for expert literature searchers. The emphasis on evidence-based practice, along with publicity about the need for more vigilance about the quality of literature searching following the unfortunate death of a healthy research volunteer at Johns Hopkins, have underscored the need for this policy document.

### WHERE KNOWLEDGE MATTERS MOST IN DECISION MAKING

It is well known in research that the results of a well-planned, expert literature search often creates the rationale for conducting a new research study (Has it ever been done before? Is it fundable?) and uncovers extant published knowledge related to the new study's proposed methodology. What has become clearer with the emphasis on evidence-based practice is that published evidence is also a critical success factor in the clinical, administrative, and information technology settings of hospitals and academic health centers.

A number of high-impact areas continue to benefit from rigorous examination of the published evidence prior to decision making. The use of evidence- or knowledge-based information retrieved through the expert searching process can help ensure the clinical, administrative, educational, and research success and positive performance of the individual health care provider as well as the hospital or academic health center.

High-impact areas include:

- Complex or unusual clinical cases: Effective management of complex cases almost invariably involves a review and ongoing evaluation of the published evidence.
- Research design support: Assistance with discovering relevant prior work related to a proposed research study or clinical trial will help refine the research problem, identify methodological techniques, uncover contradictory findings, discover alternative animal models, and avoid duplication of effort through effective use of existing knowledge.
- Support of basic science research: Expert identification and application of databases and other tools in the areas of molecular biology and genetics is used to support researchers in the basic sciences.
- Institutional support of patient safety: Support of the institution's efforts at ensuring patient safety including internal review board (IRB) activities will be assisted by expert literature consultation. IRB staff and committee members may need assistance or training

in evaluating the adequacy of the literature search portion of proposed research studies to ensure patient safety. Hospital patient safety committees may need expert search consultation to support the monitoring and resolution of operational issues related to patient safety.

■ Institutional support of litigation: Legal actions related to health care institutions including depositions by health care professionals may involve discovery of relevant biomedical evidence through the expert literature search process.

■ Key business and academic decisions: An expert search of the published and unpublished evidence may uncover knowledge that will have as great an impact on positive outcomes as a hired consultant. Support of new product line development, recruitment and retention of staff, and other business areas will benefit from the knowledge discovery process. Aca-

demically related to promotion and tenure and research productivity will be better informed through the expert search process, in particular through the use of citation searching and journal impact factors.

■ Support of scholarship and grant applications: Sophisticated literature research to discover published precedents and prior art is key to success in this area.

■ Best practice identification and development: Expert consultation on search methodology and ongoing current literature alerting is used for continuous improvement projects and for constructing best practice guidelines.

■ Evidence-based interfaces to the electronic medical record (EMR): Expert consultation is used on search methodology and literature evaluation.

■ Patient education support and information therapy: Identification of high quality, authoritative lay health materials in support of patient education is used.