

Information galore

By William Garrity

MEDLINE celebrates its 32nd birthday this October. What's MEDLINE? It's a database, managed by the National Library of Medicine (NLM), of bibliographic references to articles in 4,500 biomedical journals published in the U.S. and some 70 foreign countries. The work that underlies MEDLINE is probably not what comes to mind when most people think of "biomedical research," but it is an essential part of the way that medical science advances are made nowadays. Currently, the database contains more than 12 million references, the earliest of which date back to the mid-1960s.

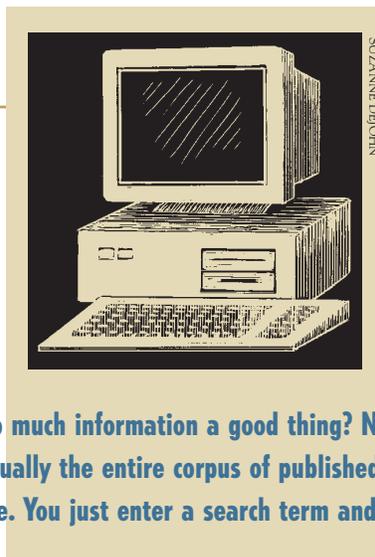
Convenience: At its birth, MEDLINE was a big deal: it was the first large reference database available via a national communications network. MEDLINE was soon considered the pinnacle of sophisticated biomedical information access. Today, we enjoy the convenience of searching MEDLINE by entering terms in a search box and getting instant results. But it hasn't always been so easy. MEDLINE grew from a computerized system that the NLM installed in 1964 to produce *Index Medicus*, a printed index to the biomedical literature. MEDLINE was part of the Medical Literature Analysis and Retrieval System, or MEDLARS. "MEDLINE" stands for "MEDLARS Online."

Initially, only librarians could request MEDLINE searches. They filled out a multipage form and mailed it to the NLM in Bethesda, Md. There "trained search analysts" processed the requests. It often took several weeks for the results to be mailed back.

It wasn't until 1971 that the online service was born. Even then the user didn't see a computer screen. Rather, the interface was a typewriter-like device connected to NLM host computers via a 300-baud direct-dial modem or TYMNET, a nationwide commercial computer network. The Internet hadn't been developed yet. By the end of 1972, about 150 libraries—all at medical schools and research institutions (including Dartmouth)—had access to MEDLINE. Service hours were limited, though. In 1982, searching hours were 3:00 a.m. to 5:00 p.m. on weekdays and 8:30 a.m. to 5:00 p.m. on Saturdays.

Companion: In 1986, the NLM simplified the search process by introducing "Grateful Med" software that could be loaded onto personal computers. Later advances included command-language searching via the Internet in 1992; "Internet Grateful Med," a Web application, in 1996; and "PubMed," plus a companion document-ordering system called "Loansome Doc," still later. (You have to wonder who's naming these products!)

PubMed, and free MEDLINE searching, were introduced in 1997. Then-Vice President Al Gore did the ceremonial first search—on treatment for a ruptured Achilles tendon. PubMed has grown from two million users then to some 39 million users now. They're about even-



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ly divided among the general public, researchers, and health professionals (including librarians).

But is access to so much information a good thing? With PubMed, anyone can search virtually the entire corpus of the published biomedical literature. It's simple: you just enter a search term—such as "ruptured Achilles tendon"—hit "Go," and, presto, you get 46 pages of references in mere seconds. But it can be difficult for people to make sense of information that's often conflicting.

The search process isn't necessarily easy for health-care providers either. Assuming a provider has time to consult the literature about a particular patient's problem, the process goes like this: 1) Provider searches MEDLINE. Fails to find anything relevant. Tries again. Maybe finds relevant citations, maybe consults a librarian, maybe gives up and consults a colleague. 2) If relevant citations are found, does the local library subscribe to those journals? 3) If yes, provider hunts them down (in hard-copy or digital form). 4) If no, does the provider have time to request an interlibrary loan? (Or maybe the provider decides that reading the abstract, if the MEDLINE reference includes one, is enough.) 5) Once the provider has the articles, she has to read and evaluate them, synthesize all the information, and decide how to apply it to the patient. It's a lot of work—almost impossible to execute at the bedside.

Cumbersome: Most providers don't have time for this cumbersome process. We are starting to see digital information resources that have presearched the literature via MEDLINE, appraised the result, and made specific recommendations about care. It's more practical to apply such tools at the bedside or in the exam room than to try to make sense of a bunch of MEDLINE-generated journal articles.

The accessibility of Web-based health information has also contributed to a new dynamic in the relationship between provider and patient. Now, patients come to appointments with sheaves of printouts from the Web. At best, they can be accurately informed about their health and be knowledgeable partners with their providers. At worst, patients can be wrongly informed, perhaps dangerously so. There is no quality control on the Web, so consumers must learn to be critical and sophisticated about what they find there.

Libraries, including the Dartmouth Biomedical Libraries, are helping to educate the public about how to find and evaluate health information on the Web. Health-care providers may want to suggest that their patients take advantage of libraries as places where they can learn to be savvy information consumers. ■

"Bench to Bedside" explores the research underlying advances in clinical medicine. Garrity has been the director of the biomedical libraries at Dartmouth since 1996.