Computers

How to choose the online medical database that's right for you

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CMA's iNet trial assessed the usefulness of electronic information systems for private practices. One result of the trial was a great number of requests for guidelines on selecting and using online medical databases. So many access routes are available that selecting one to meet your needs is difficult.

In response to the interest shown, the following is a brief review of the systems currently available. As well, it may be helpful, when considering a system's functions, to define some of the specialized terms most often encountered in the program descriptions.

"Online" means that, in accessing the systems, the user's computer is directly connected by a modem and telephone line to the source computer containing the information. To search the database, the user must type particular commands or instructions in a form that the computer understands to find the needed references and to display them on a monitor or to print them. An online search takes approximately 5 to 15 minutes, depending on the complexity of the topic and the number of references to be printed. If a large number of references is retrieved, a request can be made for the source computer to print the list "offline" — that is, after the user has signed off the system. The results of offline search can be mailed to the user.

The US National Library of Medicine's (NLM) Medical Literature Analysis and Retrieval System (MEDLARS), which refers to all of NLM's computerized literature retrieval services, currently includes about 16 different databases and contains approximately 6 million references to journal articles and books in the health sciences published in *Index Medicus* or other printed NLM indexes and bibliographies. All of the MEDLARS databases are developed at NLM. The Canada Institute for Scientific and Technical Information (CISTI) of the National Research Council, in Ottawa, offers one direct access route to NLM. CISTI provides NLM access codes to individuals and organizations, and runs MEDLARS training programs. However, some of the MEDLARS databases, notably MEDLINE and Health Planning and Administration, are also available through a number of commercial vendors. These vendors, and the introduction of electronic "gateway" systems such as Telecom Canada's iNet 2000 and the US-based Easynet, have increased the routes of online databases that are available. In fact, the proliferation of system vendors, the various selections of search software and database combinations, and the many options available in services (for example, electronic mail or online database directories) present a confusing array of systems. This situation is unlikely to change: the "knowledge industry" is a rapidly expanding section of the economy.

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- MEDLINE is the most comprehensive and economical medical database; therefore it is still the most widely used, even though it is a bibliographic file. It contains approximately 800 000 references to biomedical journal articles published since 1983. As well as article references (including the author, title and source), an English abstract, if published with the article, is frequently included. This addition is an advantage when using a computer because these summaries do not appear in *Index Medicus*. Articles in MEDLINE are from 3000 journals published in the United States and internationally. Coverage back to 1966 is available through separate databases called 'backfiles'. When the results of a MEDLINE search are displayed, the references start with the most recent article entered into the database unless a specific article is requested by author or journal title. MEDLINE references the source journal articles and often contains an abstract or short summary of the content but it is not designed to provide the full text or a copy of the original documents as published.

Recently medical full-text services have begun to appear.

although this coverage is still limited, these services are particularly for physicians who do not have ready access to a medical library.[1]

- BRS/Saunders Colleague is a medical search service that has over 15 major biomedical journals and some 25 textbooks available in full text as well as standard bibliographic databases, such as MEDLINE and International Pharmaceutical Abstracts.
- Mead Data Central, previously known for its online service to lawyers, has launched a medical full-text service known as MEDIS.[2]
- The American Medical Association (AMA) and GTE Telenet have taken a different approach by trying to provide a multipurpose information service for physicians. Their service, called MINET, includes full-text drug and disease descriptions, a small bibliographic database, continuing medical education programs, a medical news service and electronic mail.[3] The American Medical Network offers a similar service.

The trend toward electronic publishing and full-text databases is clearly tied to the marketing of online databases directly to professional users. In the past, MEDLINE searches were most often performed for physi-

Table I—Comparison of online search systems*

		Specialized medical services†	
System	Subscription fee	Other fee	MEDLINE cost and special features
American Medical Network (AMNET)	None	None	PaperChase/MEDLINE $49/h. Also includes Knowledge Index, $39/h, E-Journal (which summarizes recent medical literature) and services such as electronic mail and bulletin boards. User friendly
BRS/Saunders Colleague	Group $125 Individual $75	Monthly minimum for group $50; individual $15	MEDLINE $38/h prime; $29/h nonprime. Contains over 15 journals and 25 textbooks in full text. Other databases include PDQ, PsycInfo and others from regular BRS. User friendly
MEDIS Mead Data Central	Group or individual $200	Monthly administration $50	All files including MEDLINE $30/h. Half price in evening. An added per search charge of $6 to $21 is made depending on file groupings searched. Over 49 full-text journals. Allows searching within specialties. User friendly
MINET AMA/GTE Telenet	$100 for first user, second to 11th $25 each, max $295	Monthly minimum $220	MEDLINE not available. EMPIRES clinical database indexing 300 journals $39/h. Also has drug and disease descriptions, CME programs, news service and electronic mail. User friendly
MEDLARS NLM CISTI	None	None	MEDLINE charges based on time and type of system use. Works out to about $35/h prime; $25/h nonprime. Only system that gives access to all 16 MEDLARS databases including BIOETHICSLINE and HISTLINE for history of medicine. Command language
PaperChase	None	None	MEDLINE only. $24/h + 10¢ for each search statement or list created: 10¢ for each reference displayed and 10¢ each abstract. Automatically points user from text word to medical subject heading. Unifies spelling, plurals. Can limit search to institutional holdings. User friendly

*This summary is intended as a general guide only. Cost and special features are subject to change and should be further investigated when signing up for a system. MEDLINE and other database costs quoted include telecommunications charges as well as connect time. Some systems offer different rates in prime and nonprime time. Specific hours vary by service. However, prime time is generally considered to be weekdays; nonprime, evenings and weekends.

An average 8- to 10-minute MEDLINE search, which would involve entering two or three subject terms, scanning the most recent titles and printing about five complete references with abstracts, would probably cost $7 to $10 US. Printing out a full-text article also costs in this range and does not include the graphs or images at the present time. The systems indicated here as command language systems are generally faster to search than user-friendly services, however, they require more training and regular use to maintain search skills.

†All costs given in US dollars unless otherwise noted.

Commonly asked questions about online medical databases

Which online search system is the best?

Because of the wide range of systems available to the physician, the answer depends on what type of information is needed, such as references, full text or other services like electronic mail and continuing medical education; how much the services cost; what equipment is needed; and how much time it takes to learn the system.

If a specialized medical search service that offers both full-text and bibliographic databases in a user-friendly environment is needed, seriously consider BRS/Saunders Colleague and Mead Data's MEDical Information Service (MEDIS). AMA's MINET system is also user friendly and it offers services in addition to online databases. MEDLINE is currently not available on MINET, and MINET is being marketed mainly to hospitals and other organizations rather than to individual physicians. The American Medical Network, similar in concept to MINET, also offers PaperChase and Knowledge Index as part of its service. All of these specialized services are more expensive to subscribe to than general search services.

If only user-friendly MEDLINE access is required, consider PaperChase.[5] The Beth Israel Hospital, in Boston, developed this system, and physicians who do not have computer experience are able to use it. PaperChase is the one system that gives the user some assistance in selecting Medical Subject Headings, indexing terms that are assigned to each article by NLM and also used in *Index Medicus*. Using these headings can greatly increase the quality of any MEDLINE search by making it both more specific and more comprehensive. However, a few users find the particular menus and subject heading suggestions in PaperChase somewhat tedious. PaperChase can be subscribed to independently or through the American Medical Network.

If cost is a major concern, stay with one of the conventional search systems, such as NLM, BRS or Dialog. A recent study[6] found that NLM was the least expensive system to use. Numerous different arrangements can be made for BRS and Dialog that involve various prices and user-friendly options. Carefully review these options and choose the one that best suits your needs. The command language systems, such as NLM and the regular versions of Dialog and BRS, are for the serious searcher who uses the systems regularly and they are a faster and a more direct form of searching.

The general search systems, such as BRS and Dialog, also have user-friendly versions. BRS BRKTHRU offers a choice between full and partial menus and is available around the clock. Dialog's Knowledge Index can only be accessed on evenings and weekends. These user-friendly services have lower evening and weekend rates that are not available on the regular BRS and Dialog search services; these are designed for the individual end-user. As major commercial database vendors, BRS and Dialog offer access to online databases in other fields, such as business, social sciences, humanities, engineering and the natural sciences. The two other databases available in BRS and Dialog that are of particular interest to physicians are PsycInfo and BIOSIS, the online equivalents of *Psychological Abstracts* and *Biological Abstracts*. However, these databases are not available through NLM.

What equipment is needed to search online databases?

To access online databases, a communicating microcomputer or terminal is needed. Many physicians have access to a microcomputer in the office or at home and can use this equipment if it has a "serial" or an "asynchronous communications" card or circuit board, a modem and a cable to connect the modem and computer. Some microcomputers come with internal modems, in which case separate equipment is not required. The other essentials are a communications software package and a telephone. Online searching can be done at two speeds, 300 bits per second (bps) and 1200 bps. Searching at the higher speed saves both time and money; however, the 1200 bps modem required is more expensive. Searching on a microcomputer is, in fact, more complicated than searching on a simple computer terminal, because the telecommunications software and the modem have to be taken into account. Therefore, if searching is the only application, purchase a terminal instead (it is considerably less expensive than a microcomputer). On the other hand, the microcomputer offers such options as downloading to disk and editing offline, which can be very useful and economical. Addition information on using a mi-

crocomputer for searching can be found in the references by Fenichel.[7,8]

How much do online searches cost?

The systems vary in their arrangements and costs change periodically. NLM (CISTI) has no startup fee or monthly minimum charge and uses an algorithm based on time and characters transmitted to determine the database charges. A search during the day averages about 90¢ per minute and about 70¢ per minute during evenings and weekends. Other systems like BRS charge an initial fee of $75 (US) and then individual databases are paid for as they are used. Making cost comparisons is difficult because of the varying pricing structures (some of the key information has been summarized in Tables I and II). Alternatively, select the preferred system, work out the cost for signing up and the number of times it would be used each month; ask yourself if that amount is acceptable.

The user-friendly services, such as Knowledge Index, the menu version of BRS BRK-THRU and BRS/Saunders Colleague, tend to cost considerably more for the same search compared to the command language systems because of the time taken up by the menus. It's possible to spend a lot of money searching these systems, so it's important to search carefully in advance and make the best use of online time.

How easy to use are online systems?

Unfortunately, they are not as easy as most system suppliers would have you believe. First, the operator must have typing skills — a significant problem for many professionals who have never used a typewriter; second, he must be comfortable using the computer, the modem and the telecommunications software; third, he must learn to search the databases; and fourth, he must have the time available to learn about and to use the systems.

The typing problem can be solved by having a staff member or a librarian conduct the searches, but one of the real advantages of online searching is "being there", interacting with the computer to develop and to modify the search strategy online. Therefore, learning how to type is worthwhile. Don't be discouraged; online searching is a good place to start gaining computer literacy.

The best way to learn to search databases is to attend courses given by the system vendors in major cities and/or to study the manuals. Medical librarians will often provide informal advice on search systems and some larger medical libraries are starting to offer courses or seminars in online searching. Most vendors have toll-free telephone numbers if a particular search problem develops. After signing up with a system, vendors usually send customers periodical newsletters with search tips and news of the latest databases that have been added to the system.

Once a search system is learned, others will be much easier because the principles are very similar. Only the computer commands vary from system to system. A new book on MEDLINE searching by Feinglos[9] compares the search techniques on NLM, BRS and Dialog. Considerable time and effort are then required both to learn a search system initially and to keep up with system developments. Search often enough so that new search skills are not forgotten. If the system is used less than twice a month, delegating the searches to a librarian is a better idea.

Will online databases really be useful?

Many physicians have already found online databases to be very useful. The problem is, however, that many professionals have unrealistic expectations of the content and the ease of use of online systems as they presently exist. A great deal of advertising exists that says online systems are the "total answer" to the physician's information problem — a clear exaggeration. CMA's iNet trial found that online systems did not answer the majority of questions that come up in a physician's daily work. Many of these problems are multifaceted, requiring other types of knowledge and insight apart from the medical and scientific literature contained in online databases. It is also difficult to get to the "final answer" to a problem in online databases because what is being retrieved is literature relating to a problem rather than a specific answer. These problem-based databases will likely arrive with the next generation of artificial intelligence systems.

Despite the limitations, many physicians find online systems very useful in investigating new or unusual medical conditions seen in their practices, in helping prepare hospital rounds or other professional presentations or in keeping up-to-date with the literature. Researchers have found the systems particularly helpful in finding other studies in their field and in locating other researchers who are doing related work. Physicians in isolated locations also find the systems beneficial when they do not have access to a medical library.

Given these potential uses, you must decide for yourself whether online databases would be useful and cost beneficial in your own practice setting.■

cians by trained librarians or search intermediaries in medical libraries. While such searchers will continue to be the experts in online systems, database vendors want to expand their market to include direct use by physicians. More user-friendly forms of search software are being produced as a result. Users of most of these systems still require training in the conventions of searching online databases; however, the friendlier versions provide more prompts, allowing the user to make choices when going through the search process. Even these systems require some familiarity with the databases and search techniques to get good results. The friendlier systems are usually more time consuming and more expensive because of the extra prompts and menus. An alternative is the user-friendly "front end" software available for microcomputers that allows users to formulate a search when offline.[4] The program then logs onto the online system and executes the search, saving considerable time and money.

Besides speed of access, the major advantage in using online databases is that the search systems can retrieve information related to a specific problem. Given the ever expanding store of biomedical information, it's important for the physician to be able to supplement existing knowledge by finding additional information when it is required.

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Table II—General services which include medical databases*

System	Subscription fee	Other fee	MEDLINE cost and special features
BRS Search System	$75	Password fee $50/yr	MEDLINE $47/h. All BRS services allow searching of MEDLINE and all backfiles at once (MESZ) for a $2 surcharge. Wide coverage of other fields. Command language
BRS BRKTHRU	$75	None	MEDLINE $46/h prime + 6¢ for each reference displayed or printed. Nonprime $34/h with no added charge for references. Offers choice of full or partial menus at sign on
BRS AFTERDARK	$75	Monthly minimum $12	Evenings/weekends only. MEDLINE $28/h. No added charge for references. Offers 65 of the 95 different BRS databases with user–friendly menus
Dialog	None	None	MEDLINE $45/h. Wide coverage in all subject areas. Over 250 databases. Well-developed training programs and manuals. Command language
Knowledge Index	$35	None	Evenings/weekends only. MEDLINE $24/h. Includes other major databases, such as PsycInfo, but fewer than regular Dialog. User-friendly menus
iNet 2000 Telecom Canada	Group or individual $50 (Cdn)	Monthly administration charge for first 200 users in organization $3 (Cdn) each	Access to MEDLINE is provided through the BRS Search System at $47/h or BRS BRKTHRU, which offers lower nonprime rates. Also acts as a gateway to many other services, such as Infoglobe and Questel. Use of iNet features including directories, messaging and dataconferencing. Costs $15 (Cdn)/h prime, $11.25 (Cdn)/h nonprime. User friendly in gateway, then use the commands or menus of the particular service accessed

*All costs given in US dollars unless otherwise noted.