

## Selection: Electronic Resources

*"Science and technology multiply around us. To an increasing extent they dictate the languages in which we speak and think. Either we use those languages, or we remain mute."*

J.G. Ballard

Many health sciences libraries have microcomputer centers or areas where workstations are concentrated in order to facilitate software distribution, user assistance, and instruction. However, access to electronic resources is often not restricted to special settings. This chapter treats collection development for electronic resources in general, irrespective of the site from which they are used. While selection decisions parallel those for print materials in many ways, electronic formats are treated in a separate discussion because their unique characteristics introduce additional factors to collection decision making and because these formats can affect information delivery, budgeting, equipment, and staffing in profound ways.

Electronic resources play an essential role in every health sciences library, whether it is a microcomputer-based catalog and telecommunications to a vendor-managed MEDLINE database, or includes CD-ROM databases, computer-assisted educational software, and a locally mounted subset of MEDLINE. These resources are usually expensive, often more expensive than their printed counterparts, if such exist. Pricing may reflect research and development costs for the developers. As computer-based information consumes a greater proportion of a library's budget, a correspondingly greater degree of care should be taken in making decisions regarding what the library will provide for its users. Both policy and procedures need to be defined. The Association for Library Collections and Technical Services

From: Collection Development and  
Assessment in H.S. Libraries  
Richards & Eakin  
Lanham, MD: Scarecrow  
1997

(ALCTS) has published a useful *Guide to Selecting and Acquiring CD-ROMs, Software, and Other Electronic Publications* [1].

## Collection Policy

As knowledge-based computer programs in clinical medicine and other health care disciplines are improved and gain wider acceptance, they appear more commonly as library resources, especially if they can be consulted through remote access from offices or clinical care sites. As with print material, selection of computer software for use by students, hospital staff, faculty, clinicians, or researchers should be guided by the library's collection policy. Examples of policies for electronic datafiles and computer software can be found in the Medical Library Association's DocKit on Collection Policies [2]. The policy should address the criteria by which these resources are chosen. Scope, depth, and audience will define the boundaries.

Several types of software may be acquired by health sciences libraries:

- bibliographic
- full text: books, journals
- numeric or factual databases
- clinical assist programs for diagnosis or treatment decisions
- educational software, for example:
  - computer-assisted instruction packages
  - simulations of laboratory experiments, patient interviews
  - study guides and tests
- applications software, for example:
  - word processing
  - analytical or statistical packages
  - file management
  - telecommunications
- administrative functions or staff support

The following criteria illustrate the factors taken into account in the decision making process.

### Scope

The primary criterion should be whether the resource fits the subject scope of the library. As with print materials, the subject focus will be primarily in health sciences disciplines. If the subject is peripheral to the

library's core collecting responsibilities, this may be grounds to turn down a user's request or to seek extra budgetary funding.

### Depth

The intensity of collecting in a discipline may dictate how many resources the library will acquire, or the degree of specialization needed. For example, if the neurosciences are not an area of intense collecting, then a library may not acquire the *Neurosciences Citation Index* database, especially if it already provides the more general *Science Citation Index*.

### Audience

Perhaps a more critical question than for any other format is whose needs the library intends to serve with computer software. If the library's clientele includes health professional students, relevant resources will differ depending on whether the library supports the entire educational program or only the clinical training. In medical school settings, resources directly related to the curriculum will be the most commonly acquired software. The library should be cautious about acquiring programs that the students are not actually required to use for their coursework or patient care assignments. Schools that use a problem-based approach or emphasize self-directed learning may encourage students to use a wide array of resources. In schools with a more traditional curriculum, students have little time at their disposal and rarely turn to supplemental materials [3]. As with audiovisual materials, computer-based resources for student use should usually be selected with advice and recommendation from faculty or potential users.

For practitioners the library may consider specialized diagnostic assist software, electronic reference texts, treatment protocols, emergency treatment information, or drug resources.

If basic research is supported by the library, then the resources that will contribute to the research effectiveness of the institutions must be considered. Access to resources such as genetic databases, citation indexes, and electronic journals may be appropriate.

## Selection Principles

Each library will need to establish a set of criteria to assist in making individual selections of electronic resources. The first decision should be

whether the resource serves the mission of the library and fits the scope and depth defined in the collection policy. It should meet information needs of the library's users. Secondly, specific criteria should address the content, the user interface and retrieval software, the format, and the hardware and software required by the resource. These criteria may be applied as appropriate for the particular type of resource. Careful investigation and evaluation of the cost-effectiveness of different formats should precede any decisions. An information policy both for the library and for the institution will help guide these decisions.

Selection of resources in formats that have not been integrated into the library's collections, operations, processes, or services will require involvement of staff throughout the library, including those with responsibilities for collection development, user assistance, ordering, cataloging, and computer system support. Demas has suggested forming an electronic resources council as a "cross-functional forum for reviewing and approving selection of electronic resources that have not yet been fully mainstreamed" [4] to assess the impact of proposed new resources and to coordinate functions among library units.

## Selection Criteria: Content

Many of the elements by which content scope and quality are judged will be the same regardless of format: print, electronic, or other media.

### Quality

As with print materials and audiovisual media, computer programs with health sciences content must be judged on the quality of the material presented. Criteria include authoritativeness of the content, expertise of the authors, reputation of the producer, and comprehensiveness of the information. If illustrative material is important, quality of the images will be a critical factor. The use to which programs will be put will influence which factors are considered most heavily in choosing software programs. Computer-based diagnostic systems are used by physicians as a form of consultation or to produce lists of potential diagnoses. These programs must be judged carefully and should always be reviewed by the clinicians who may utilize them. Performance measures, such as the proportion of correct answers, comprehensiveness of the database, and relevance of retrieved possible diagnoses may differ among programs [5].

## Currency

If the software is designed to assist with diagnostic or treatment decisions, regular updates should be provided. Some software programs, e.g. *Quick Medical Reference—QMR*, have a mechanism whereby earlier versions are inactivated after a specified time period, based on the expected date for the next release.

## Content Usefulness

If the software is intended for student use and is being used as a teaching tool, it should offer features that contribute to learning, such as interactive capabilities or testing. Most educational software should be responsive to user input—either in the form of answers to questions or entry of data.

Multimedia products offer limitless possibilities for professional education, clinical problem-solving, and continuing education. They enable the user to simultaneously hear and see the heart beating and view the electrocardiograph tracing; to hear and see a lecture or patient interview. Resources that combine text and images, sound and movement, and that give the user control over the order, speed, size, and level of detail of information will transform the world of textbook medicine.

Clinical-assist software should offer more than highly accurate, up-to-date knowledge. It should be able to show relationships and probabilities, based on user input that would be impossible or extremely laborious to achieve otherwise. As a memory extender it must verify known information or alert the user to relationships, such as drug interactions, of which the clinician may be unaware or has forgotten. Diagnostic-assist tools should suggest possibilities that are reasonable and useful for the practitioner.

## Relationship to Print Publications

If the resource has a print counterpart, one should consider whether the content of the electronic version is enhanced by additional material, such as expanded coverage of journals, abstracts, full text, citations, or other data. Several factors will influence the library's decision to acquire both a print and electronic version, or electronic only. These factors may include convenience of access; amount of demand, especially if competing with other resources on a single workstation or small network; and need for permanent preservation. Increasingly, monographs are accompanied by data diskettes. Updates may be offered electronically through networks.

## Selection Criteria: User Interface

### *Ease of Use*

Some users will be willing to struggle with programs that are complicated or require some diligence to use effectively, especially if they have a flair for computers or if use of the software is an essential part of the curriculum. Many will be patient or persistent. However, busy practitioners are likely to be intolerant of software that cannot be used with ease. Commands or menus should be intuitive or at least very clear; time should not be squandered with excessive steps to retrieve information. Graphical user interfaces (GUI) are easier and more enjoyable for most users, but even these interfaces can become confusing if they are too cluttered with choices and there are so many pathways that the user becomes disoriented. Screen displays should be easily understood. Comparison studies can be useful. An example is the forum sponsored by the National Library of Medicine to evaluate the different CD-ROM formats for MEDLINE [6].

### *Software Functions*

The search engine or other control functions should be powerful enough to support the resource. Response time should be snappy. For database programs, consider whether the search interface permits use of Boolean operators (and, or, not), truncation, and adjacency features, and whether searches or search strategies can be saved.

### *Printing and Downloading Capability*

Depending on the institutional network and workstation configurations, the ability to print and download from electronic files can be problematic. It is wise to investigate the specific requirements for these essential features, both for in-library and remote users. No one is more unhappy than a user who has identified material that precisely meets an immediate need, only to find that it can't be printed. Most will also wish to be able to send results of searches to another address via electronic mail.

## *Duplication of Print Publications*

When software duplicates to a large extent a print publication, such as a textbook, the library must determine whether the electronic version offers additional features that justify its purchase. Can the user search topics more easily or move from one concept to another using a hypertext or a similar application? Will the software reformat information and display it in unique ways? Can illustrative material be manipulated or animated? Can data be extracted and manipulated for individual use?

## *Compatibility with Other Resources*

When there is a choice, there may be an advantage to selecting as many resources as possible from the same vendor to minimize the number of different interfaces a user must learn. When the institution has a single interface used to access multiple information sources, regardless of their source, users will be more facile in using the range of resources available. Use of a common interface instead of the interface developed for the product, however, may inhibit the user's ability to maximize the particular database because all features may not be available.

## *Documentation and Guides*

The producer should provide documentation and guidance in use of the resource. An adequate number of manuals should be supplied and they should be easy to consult. If there are help screens for various functions of the program, they should be easily accessed and understandable. They should address the question the user is likely to have at the point in the program where the help feature is activated. The user should be able to easily return to the previous step. An 800 number for help may be an advantage, but its usefulness can be impaired by long response times. The technical support staff should be knowledgeable and helpful.

## Selection Criteria: Format

One of the most vexing questions libraries face is the choice of format when multiple options exist. Does the library provide access to an index or other resource only in print, on standalone CD-ROM or CD-ROMs on a local area network, by tapes mounted on the local institutional network, or

by various routes to a remote utility through a gateway? The library should consider the following factors in making these decisions.

### *Users*

Consider the likely users: members of a single department, individuals throughout the institution, or students in a professional education program. If the resource is applicable to very few, the cost of the resource and all the support it will require may not be justified.

### *Expected Use*

Consider the anticipated demand. The number and frequency of use of each user group will affect decisions, not only about acquiring the resource, but about licensing, multiple-access points, and user assistance.

### *Accessibility*

Consider the users and where will they want to use the resource: in the hospital, from labs and offices, in the library or learning center, from remote clinical sites, or from home. Convenient access to network resources will increase the likelihood that individuals will use the resource.

### *Content*

If a resource is available in different formats, consider how they differ in comprehensiveness or specialized content. Compare the interface and performance characteristics. Is the electronic format updated more or less frequently than the print format? Software may offer full text indexing that is not possible from a print version. Some may bundle several resources together, such as textbooks, dictionaries, or other reference works and journal articles.

### *Costs*

Consider the anticipated cost per use. Ongoing producer or vendor charges for maintenance, upgrades, and required new versions must be

factored into cost decisions. Equipment and system or network costs must be evaluated, as well as other support costs.

### *Equipment*

Consider whether the resource is compatible with local systems. Changes or upgrades may be required. Users may or may not have necessary equipment and software to access the resource. Does the library possess the needed expertise to support the resource? Even if it does, the library must judge where to put staff time and effort.

### *Legal Issues*

Consider whether site or multiuser licenses are available. If restrictions apply to making backup copies, downloading, and printing the library needs to understand this and determine its impact on the local environment and anticipated use. If the publisher imposes restrictions that would inhibit the expected use, the library should attempt to negotiate a change or decide not to acquire the program.

General recommendations are very difficult to make. Each environment must be assessed in terms of its resources, users, needs, and opportunities to participate in shared systems. In a large institution it may be cost-effective to acquire and manage subsets of heavily used databases, such as MEDLINE. These may be part of a campus-wide, multicampus, or even state-wide system. On the other hand, a CD-ROM version may be the best choice for smaller libraries without network capabilities. Boss has suggested a method for cost analysis to guide decisions [7].

## **Selection Criteria: Hardware, Software, and Space Requirements**

Designing microcomputer facilities within libraries is a sufficiently large topic to justify its own book, which fortunately has already been written. Hannigan and Brown discuss in detail considerations for equipment and space [8]. What is appropriate to note here is that the special needs for access to computer-based resources impose another significant set of questions to consider when building collections.

## Space

A decision to acquire computer-based resources assumes the library has facilities for using them. One consideration in making decisions is whether the facilities are conducive to the type of use that will be made of them. Materials that are consulted quickly or do not require intense concentration may be used on workstations in busy open areas. If assistance is likely to be needed, workstations should be situated where help is easily available. Some individuals can work in a crowded, noisy environment. Others find it difficult and work more effectively where there are fewer distractions. The library should assess the needs of all its user groups when determining how to place workstations within the library and, in selecting electronic resources, consider whether they can be used effectively in the available setting.

## Workstation Configuration

The library's networking capability needs to be considered. Do users have remote access to the network from outside the library? If all resources are on a network server, the library will need staff to manage the network resources effectively. Workstations dedicated to single resources should generally be avoided, except as needed to preserve constant access to the most heavily used resources, such as MEDLINE or the library's catalog. If the library has numerous resources requiring manipulation of CD-ROMs or diskettes, how convenient is access? There should be an adequate number of workstations for effective use of computer-based information resources. Resources that require proprietary hardware should be avoided if there are reasonable alternatives. Technology changes too rapidly to justify purchase of single-purpose dedicated equipment under most circumstances.

## Compatibility

Consider whether the computer-based resource being evaluated is compatible with existing equipment. Memory must be sufficient and the machine fast enough for the type of content, such as images. The new software must be evaluated to assure that it won't conflict with any other resources on the same equipment, by disabling programs or degrading response time.

## Additional Software

Determine whether the resource requires specific software, such as an operating system or database loader. Audio and video will require additional components. The existing hardware must be adequate to accommodate the required software or the library will need to budget for new or upgraded equipment. Staff expertise must be available to install and maintain it.

## Licensing Agreements and Copyright Restrictions

Cramer has suggested several actions libraries should take when faced with license agreements for electronic products [9]:

1. Determine what you are going to do with the product prior to purchase or renewal.
2. Build a relationship with your legal staff.
3. Establish a contact with the vendor to answer questions.
4. Obtain a copy of the license agreement as part of selection process.
5. Understand local definitions of user, site, etc.
6. Be clear about deviations from the standard license agreement.
7. Spell out local requirements to vendor.
8. Be prepared to monitor use for compliance.

In some cases, especially for subscriptions to databases, the library does not own the software and if it discontinues the subscription must return the disks already received. Restrictions on access and use may also pertain and should be reviewed carefully prior to purchase.

If purchasing an electronic resource for which there is a corresponding printed product, any requirement to continue subscribing to the print version should be weighed against total costs and expected use for both formats. Some licensing agreements restrict use of databases to certain classes of users, such as students. If restrictions limit the usefulness of a resource significantly and acceptable modifications cannot be negotiated, the library may decide to forgo acquiring it.

Copyright guidelines for electronic formats are somewhat murky, but libraries should follow reasonable practices to protect software from abuse by prohibiting unauthorized copying and making information available to users. The library should prevent, to the degree possible, illegal downloading and copying of databases and full text files.

## Policies on Applications Software

Some health sciences libraries have a role in providing tools that help their clientele manipulate information or accomplish tasks. Individual health professionals, especially faculty and researchers, will usually have computer resources available in their own offices and labs, and if they work at home, they are likely to have similar access to word processing and other general use software. They may expect the same resources when they escape to the library to work. Students, who depend more heavily on on-site use of the library, may also need access to applications software that, although not a medical resource, will nonetheless assist them in their studies. As personal computers have become more compact and convenient, users will more routinely bring their own computers with them. However, the library will likely continue to have a role in providing software applications through library-based network resources to which users can link from their own computers.

The library should have a policy on whether it acquires general purpose software in addition to subject-related resources. Once acquired, the library must then decide whether these types of software are considered part of the collection, that is, whether they are funded from the collection budget.

### *Word Processing*

Although clearly not an information resource itself, word processing can facilitate notetaking, downloading information from other electronic resources, and writing papers or case reports.

### *File Management*

Software that allows users to organize, format, and search references in their own bibliographies or assists with reprint file management may have a justifiable place in the library. Searches conducted by the user in the library may be downloaded and formatted for personal use. Library staff may have instructional programs that demonstrate how to use such software for better management of individual information files. Having the software and documentation available in the library for public use will complement the educational programs and encourage practice and continued use.

In selecting which program to acquire, compatibility with other resources such as journal contents services (online or locally managed files) or databases may be a factor. Whenever possible, users should be able to

download or transfer references from searches into their own files with the least effort and without needing to reformat.

### *Authoring Software*

Health sciences libraries that serve medical or other health professional schools may consider making available software that assists faculty in developing computer-assisted learning programs. Opportunities to use simulation software, hypertext programs, and other types of authoring programs may stimulate faculty to develop innovative approaches to teaching and to assessment of learning. Library staff may use such software for developing materials for library education programs and user orientations.

### *Analytical Software*

Spreadsheets, statistical packages (such as SAS or SPSS), and database management software may also be useful in the library context for students undertaking research projects or working on papers. Faculty needing such software are more likely to have resources available within their own offices or labs.

### *Graphics Software*

Software that creates graphs, charts, and other illustrative materials, including those that produce slides or overhead transparencies will be greatly appreciated by faculty or staff who teach or make presentations, if these services are not readily available through a biocommunications or publications department. Presentation software that incorporates text, visual, and even audio material offers an easy method for library users and staff to present information for lectures, seminars, or reports.

Even if a library determines that any or all of these types of resources are justified and fit the library's purpose, the question remains about how intensely to acquire them. Typically only one word processing program (or two, if the library has both PCs and Macintosh computers) will be offered, only one graphics program, etc. Decisions may depend on whether the institution uses a standard set of software, has acquired site licenses, offers instruction, and other similar factors. If the library provides classes or demonstrations on a variety of file management software, then it may wish to make each program taught also available for public use.

## Sources of Information

Reviews or descriptions of new software programs in the health sciences may be found in *JAMA*, *MD Computing* [10], *Bulletin of the Medical Library Association* and a growing number of publications geared toward information professionals. A summary of medical CD-ROM products reviewed by Hogan in *JAMA* was published in 1993 [11]. *Information Today* includes a section "CD-ROM Today" which contains product information [12]. Other sources are *CD-ROM Professional* and *CD-ROM Librarian* [13-14]. *Library Journal* publishes a regular CD-ROM review column, which sometimes includes health resources, primarily for the public.

The "Library for Internists," published every three years in *Annals of Internal Medicine*, lists a small number of databases and CD-ROM products [15]. In the 1994 edition, most of these entries referred to various forms of MEDLINE, but one would expect the software selections to grow in the future.

To identify programs in the health sciences, selectors might consult the *Software for Health Sciences Education: A Resource Catalog* [16]. Each year *MD-Computing* devotes an issue to its "Annual Medical Hardware and Software Buyers' Guide." Listed by MeSH term, entries consist of vendor-supplied descriptions, including system features and technical information. NLM has published a listing of items in its collection [17]. Two nursing sources include the *AJN Multimedia Catalog* and the *Directory of Educational Software for Nursing* [18-19].

The Lister Hill National Center for Biomedical Communications sponsors an online computer conference network, E.T. Net, that seeks to link users with developers of interactive technology in health science education and encourages participants to share reviews and comments on software. A separate conference, NUCARE (NURSING CARE RESEARCH), promotes similar communication for the nursing profession. Numerous interest groups and discussion lists may be identified on the Internet where information about electronic products are shared [20].

More general compilations may be found in *CD-ROMs in Print*, the *CD-ROM Catalog*, and the online directories, *CD-ROM Databases* and *SOFT; Buyer's Guide to Micro Software* [21-24]. A list of health sciences CD-ROM products has been extracted from *CD-ROMs in Print* [25]. This list groups similar resources together, including full text journals, books, and databases, subdivided by specialty. Vendors also produce catalogs periodically that list new products of interest to health sciences libraries [26-28].

Information about new software developed for health professional education is described in the annual abstract book that accompanies the Research in Medical Education (RIME) exhibits at the annual meeting of the Association of American Medical Colleges. The voluminous proceedings

of the annual *Symposium on Computer Applications in Medical Care* (SCAMC) also describe many new applications. Viewing the proceedings is, of course, a poor substitute for seeing demonstrations and hearing discussions at the meetings themselves.

The Health Sciences Consortium, a consortium of institutions that promotes development of instructional materials in health sciences education, issues catalogs on computer-based education programs, as well as more general medical and allied health catalogs that include computer-based programs [29]. Their catalogs include descriptive information, hardware requirements, and cost. In addition to the catalogs, the Health Sciences Consortium issues a quarterly newsletter and distributes announcements and fliers about individual computer-based education programs.

## Selection Process

Most libraries acquiring such software will want to be assured that the product has been assessed positively by subject specialists. In addition to seeking published reviews, recommendations from local users should be obtained; this input may in fact be more crucial to the decision than the external review. It is often possible to get a demonstration version of the software to examine and evaluate. However, unlike review copies of videos or films, demonstration copies of software are often extremely limited and cannot be considered working copies of the software. A more reliable evaluation may be obtained by visiting a site where the software is currently in use.

Because electronic resources may have implications for equipment, library and institutional networks, mainframe resources, system staff requirements, and consortial arrangements, the selection process should include consultation far beyond the decision of a selector, selection committee, or department. If decisions regarding electronic resources are made fairly frequently, the review process should be formalized. A committee, including representatives with knowledge of the system requirements, may be used. If a committee already makes decisions on journals or other materials, the same committee could be expanded when reviewing electronic resources.

Prior review and consultation with the appropriate systems staff, within the library or at a broader level depending on the application and institutional environment, will lay the groundwork for final decision making. Because additional costs for hardware upgrades or support software may be involved, decisions should not be made precipitously without adequate information.

A checklist of criteria to be used in assessing an electronic resource will assure that all the important factors are considered. The published literature should always be checked to determine what experiences others may have reported with a product or application. When there are multiple products that appear to offer roughly the same content, the decision-making process may be more time consuming as a careful comparison of alternatives must be made.

### Costs and Budgeting

Computer-based resources have complicated many of the collection decisions in health sciences libraries. Although some advocate "mainstreaming" electronic resources into the collection budget, this approach may take different forms [30]. Which costs should be considered collection costs? Support software costs such as operating systems, menus, use-monitoring software? Hardware costs? Staff support costs to install and maintain?

Both initial and ongoing costs must be considered. In addition to the cost of the software itself, what is the cost of upgrading existing equipment or acquiring new hardware or associated software needed to use the product? Is an annual software maintenance fee required? What are the requirements to acquire new versions as they are released?

When purchasing resources that will be accessed through a network, additional costs must be determined. The producer may offer a network version, or may price the product on the basis of the number of simultaneous users permitted. The amount of use should be estimated in order to determine how many simultaneous users to allow for and to judge whether a network version will be cost-effective.

In order to control costs and encourage a systematic approach to selection, it may be helpful to designate a portion of the collection budget specifically to acquire locally installed electronic resources, even though these resources themselves may fit other budget categories, such as journals or reference materials. As electronic resources become more commonplace, they may be integrated into other collection categories, such as journals, monographs, or subject allocations.

Costs for locally mounted databases such as MEDLINE may also be included within the collection budget. The full costs may encompass not only acquiring or leasing the databases, but storage space and other computer costs. Even if these are not included within the collection budget, they need to be considered when determining the overall cost of providing access to the resource.

### Funding Sources

Although basic information resources in electronic formats will be incorporated into the library's collection budget, other sources of funds should not be neglected — especially when they permit experimentation or allow the library to introduce its users to new resources.

### Cooperative Endeavors

A number of libraries or institutions may join together to purchase or lease databases that are then made available to their respective users through a common network. Libraries that participate in an integrated library system on a single campus, or share a system within a multicampus system or consortium, have a good opportunity to add databases to the shared system, often with the advantages of linking the bibliographic databases to local library holdings and presenting the user with a single interface.

### Cost Sharing

When acquiring subject specific software for which the expected user population is concentrated in a single department or school, shared funding may be considered. A department might support the purchase or if the interest is broader, the cost could be divided among departments. In funding a major resource such as MEDLINE or *Science Citation Index*, a formula could be developed to apportion costs among the various institutional units.

### User Charges

Another cost-sharing device is to charge each user for consulting or retrieving information from a resource. The literature is replete with debate over whether to, when to, and how to charge individuals or groups of users. Options include per-use charges, flat rates, block purchases, and other formulas. When weighing alternatives, the institutional environment, the ability and inclination of users to pay for resources, and potential barrier to information charges might impose, will drive the decision.

## Staffing and Service

What will be the staff costs to install and maintain the software? How often are updates or new versions expected, and what is the anticipated cost? How much staff time will be anticipated to provide user assistance? Can the library provide that assistance? If not, how high will be the level of user frustration?

Chiang has suggested four potential levels of service [31]:

- Referral: telling requesters where they can find a resource.
- Reference: telling someone about a resource; providing a description or recommendation.
- Consultation: showing someone how to use a resource; providing assistance.
- Instruction: teaching formal classes in use of a resource.

Before making a decision to acquire an electronic resource, the library must agree on what level of support staff should give and whether they can in fact provide it. Does the library have staff who are expert enough to provide consultation? On all applications, or only some? A mix, depending on the resource, is quite possible. For instance, the library staff may teach courses on use of file management software, provide expert assistance with an electronic textbook, give a description and basic introduction to clinical diagnostic software, and refer a requester to another department for a statistical package. The level of support should be determined prior to purchase, following a conscious policy.

## Updates, Retention, and Preservation

### *New Versions*

In the same way that print publications are updated with new editions, computer software is updated with new versions. Should the library acquire every new version, especially if updates are not included in the pricing? While the decision is not as simple as choosing to purchase a new edition of a textbook, some of the questions may be the same, such as the extent to which the field has changed, making the content significantly out of date. Additional factors also need to be considered: has the user interface changed? If so, do the changes improve the effectiveness of the product or

make it easier to use? Have the memory requirements increased? Will the microcomputers or server on which the software is installed still be adequate? Whatever the answers to these questions, decisions not to acquire updates or revisions should be clearly articulated to library staff and users.

### *Retention*

As with printed publications new versions of electronic resources may supersede earlier editions. Unless the previous version offers content that is still useful and is not contained in the current release, earlier versions of electronic resources will not ordinarily be kept.

The reasons for discarding earlier versions have to do both with technology and with type of use. In common with audiovisual programs, computer-based programs are often created specifically for student use, rather than as more traditional information sources. As learning tools, they should be as up-to-date as possible. Additionally, if the software has seen significant changes in the user interface, it will be confusing to users to have versions that differ noticeably, especially if earlier versions have fewer features. It is also possible that if the library has updated its technology to accommodate new software requirements, older versions may become incompatible with existing equipment. As electronic information resources become more standard and encompass a broader range of uses, research libraries may give more thought to retaining representative versions of selected products.

### *Preservation*

Electronic media have an unknown life-span. Content that has lasting value and that is not available in a more permanent medium may be lost to the future. On the other hand, electronic resources may also provide access to the content or reproduction of older works that might otherwise be unavailable. For many health sciences libraries, with an emphasis on current information and primarily supporting teaching or patient care, archival quality is not an overriding concern. For major research collections, the question of what should be preserved will become more acute as more resources are produced only in electronic form and hardware, software, and operating systems become obsolete at accelerating rates.

## Local Productions

Software produced by the local institution will often be made available through the library or associated learning center, especially if used in conjunction with the curriculum. If the library has archival responsibilities or collects books within scope by local authors, it should also consider acquiring significant computer-based products developed within the institution.

## Review and Evaluation

Electronic resources should be evaluated on a regular basis. Ongoing commitments need to be reviewed. The library must assess how much and by whom the programs are being used and whether they are serving their intended purpose. Newer products should be reviewed to determine whether the current resource is still the best choice among available resources. Single purchase software should be assessed to assure that it is being used and still provides accurate and current information. If more recent versions are available, they should be evaluated. If a more current version is acquired, the library will need to decide whether to keep previous versions. Except for situations where older information has some value from a historical or research perspective, outdated sources are not likely to prove useful. Collections, electronic as well as print, require regular attention; each library should have a collection assessment plan in place.

## Remote Resources: the Global Context

The world of text, image, data, and multimedia information, as well as individual collaborative communications accessible through the Internet, has exploded. This world is changing daily and any textbook discussion will be sadly out of date by the time it reaches the reader. Interfaces and browsers in use today (Gopher, WorldWide Web, Mosaic, NetScape) may be gone tomorrow. The challenge to libraries in general, and collection development in particular, is to find the proper perspective for these far-flung resources, when access can be confusing, erratic, and disorganized as well as fun and full of exciting discoveries.

One method of harnessing remote resources to meet needs of the local institution is to view them as both an extension of the library's collections and as an integral part of it, applying similar criteria for selecting and providing easy access. Riley and Shipman have described a process of

"resource discovery," resource evaluation, and menu design [32]. In the resource discovery phase, potential resources are identified through listservs, newsgroups, and Internet resource guides. Following discovery, resources are evaluated using criteria similar to those for electronic resources: perceived quality; relevance to local activity and interest; "fit" with local/available relationship to other library resources; and evidence of ongoing maintenance. Selected resources, which have been screened and recommended are added to the institution's local menu of resources, facilitating easy access by users.

Not only do the individual information resources accessible through the Internet continually appear and disappear, but so do the network sites that point users to them, through such programs as Gopher or World Wide Web (WWW). Because of the transient nature of these resources, only two electronic directories are mentioned here. Both are interdisciplinary directories listing a wide variety of Internet resources: *Clearinghouse for Subject Oriented Internet Resources Guide* (Ann Arbor: University of Michigan, <http://WWW.lib.umich.edu/chrome.html>) and *Yahoo* (<http://WWW.Yahoo.com/Health>). A subject directory has also been published in paper form [33].

Identification, evaluation, and ongoing monitoring of remote resources can be incorporated into collection development responsibilities. Selection guidelines developed for local collections can be adapted to address the unique aspects of Internet or other remote resources [34-35]. By selecting particular resources and guiding users to them through local information systems, the library plays an important role in making the vast world of accessible resources more responsive to institutional priorities and individual user needs.

## References

1. Bosch S, Promis P, Sugnet C. Guide to selecting and acquiring CD-ROMs, software, and other electronic publications. Chicago: American Library Association, 1994. (Acquisitions guidelines no. 9).
2. Morse DH, Richards DT. Collection development policies for health sciences libraries. Chicago: Medical Library Association, 1992. (MLA DocKit no. 3).
3. Taylor CR. Great expectations: the reading habits of year II medical students. *New Engl J Med* 1992 May 21; 326(21):1436-40.
4. Demas S. Collection development for the electronic library: a conceptual and organizational model. *Libr Hi Tech* 1994; 12(3):71-80.
5. Berner ES et al. Performance of four computer-based diagnostic systems. *New Engl J Med* 1994 Jun 23; 330(25):1792 - 1826.
6. Elliot R, ed. MEDLINE on CD-ROM; National Library of Medicine evaluation forum. Medford, NJ: Learned Information, 1989.
7. Boss RW. Accessing electronic publications in complex LAN environments. *Libr Technol Rep* 1992 May-Jun;28(3):311-20.

8. Hannigan GG, Brown JF. Managing public access microcomputers in health sciences libraries. Chicago: Medical Library Association, 1990.
9. Cramer MD. Licensing agreements: think before you act. *Coll Res Libr News* 1994 Sep; 55(8): 496-7.
10. MD Computing. Bimonthly. New York: Springer Verlag.
11. Hogan R. Medical CD-ROMs. *JAMA* 1993 Oct 6; 270(13): 1613.
12. Information Today. Monthly. Medford, NJ: Learned Information.
13. CD-ROM Professional. Bimonthly. Weston, CT: Pemberton Press.
14. CD-ROM Librarian. Bimonthly. Westport, CT: Meckler.
15. Mazza JJ. A library for internists VIII. Recommendations from the American College of Physicians. *Ann Intern Med* 1994 Apr 15;120(8):699-720.
16. Software for Health Sciences Education: a resource catalog. 6th ed. Ann Arbor, MI: Learning Resources Center, Office of Medical Education, University of Michigan Medical Center, 1995.
17. NLM Catalog of Publications, Audiovisuals, and Software. Bethesda, MD: National Library of Medicine. 1995.
18. AJN Multimedia Catalog. New York: American Journal of Nursing Company, 1994.
19. Bolwell C. Directory of Educational Software for Nursing. 5th ed. New York: National League for Nursing, 1993. (Publ. no. 41-2553).
20. King LA, Kovacs D. Directory of electronic journals, newsletters and academic discussion lists. 4th ed. Washington, D.C.: Association of Research Libraries, 1994.
21. CD-ROMs in Print; an international guide to CD-ROM, CD-I, 3DO, MMCD, CD32, multimedia and electronic book products. Annual. Westport, CT: Meckler Media.
22. CD-ROM Catalog. Annual. Los Angeles, CA: Updata Publications (<http://www.updata.com>).
23. CD-ROM Databases. Monthly. Boston: Worldwide Videotex.
24. SOFT; Buyer's Guide to Micro Software. (Distributed through BRS, Dialog).
25. Chiang D. CD-ROMs in health sciences libraries. *Med Ref Serv. Quart.* 1993 Summer; 12(2): 67-81.
26. CD-ROM Handbook. Birmingham, AL: Ebsco Subscription Services.
27. Faxon guide to CD-ROM. Boston: The Faxon Company.
28. Multimedia catalog. Dallas: J.A. Majors.
29. Computer-based Education Catalog. Chapel Hill, NC: Health Sciences Consortium, 1995.
30. Demas S. Software and collection development. Pt. I Mainstreaming software. *Tech Serv Quart* 1990; 7(3): 13-16.
31. Chiang K. Software and collection development. Pt. II Services and staff skills. *Tech Serv Q* 1990; 7(3): 17-20.
32. Riley RA, Shipman BL. Building and maintaining a library gopher: traditional skills applied to emerging resources. *Bull Med Libr Assoc* 1995 Apr; 83(2): 221-7.
33. Internet resources: a subject guide. Chicago: Association of College and Resource Libraries, 1995.
34. Demas S, McDonald P, Lawrence G. The Internet and collection development: mainstreaming selection of Internet resources. *Libr Res Tech Serv* 1995 Jul; 39(3): 275-90.
35. Cassel R. Selection criteria for Internet resources. *Coll Res Libr News* 1995 Feb; 56(2): 92-3.

## Selection in Special Settings

*"There are times when I think the ideal library is composed solely of reference books. They are like understanding friends, always ready to change the subject when you have had enough of this or that."*

J. Donald Adams, 1956

Health sciences libraries exist to serve a range of user interests. Consequently, the collections and emphases in those collections can and will vary significantly from library to library. There is great similarity among collections that support an academic curriculum in the health sciences or in libraries where the focus of the collection is research in a particular field such as pharmaceuticals. One expects the collections to contain a high percentage of the same materials. While most libraries will hold a common core collection of book and journal titles that focus on the health sciences generally, those libraries will also have reference collections to support information services. The selection process for reference materials requires the consideration of additional criteria before making a decision. Collections that support research in historical health sciences topics or that provide assistance and information to health care consumers are assembled with different criteria in mind.

In each of these special settings, there are special concerns in the collection development process, principally in selection of materials, which are different from collection development for general book and journal collections. The generic criteria described in Chapter 4, Policies and Criteria, and elaborated on in Chapters 5, Selection: Journals and Books, and Chapter 6, Selection: Electronic Resources, will apply to selection in special settings, though the emphasis and applicability may vary. Further, there are some specialized selection sources which will be of interest. The following sec-