A recent paper by Dr. John U. Thomson, now Dean of the Iowa State University College of Veterinary Medicine, lists four building blocks in the veterinary curriculum essential to the future competence of the profession: expert-based learning (typically biomedical science courses taught by an expert in the discipline), problem-based learning (PBL), evidence-based medicine (EBM), and finally, medical outcome assessment, which he describes as a prospective longitudinal clinical trial conducted by veterinarians to help fill gaps in the scientific knowledge base (1). Veterinary reference librarians have long supported the traditional expert-based learning by helping students find needed books and journals in the library, teaching online catalog and database use one-on-one and in classroom settings. Librarians have also worked with instructors in putting class materials on reserve and at times may teach one or more class sessions in a particular course on information retrieval using in-library, catalog, database, and Internet resources.

At least two of the other veterinary curriculum building blocks mentioned above, PBL and EBM, would appear to offer new challenges and opportunities to veterinary librarians. Problem-based learning, while it has been adopted in educational programs in a variety of disciplines since the 1960s, is of growing interest to veterinary colleges in the U.S. and elsewhere according to a recent journal article (2). Its author identifies several common key features of PBL programs which include teacher as facilitator, the use of problems or “scenarios,” learning in small groups, and assessment. The tasks of PBL focus on problem identification, setting learning goals as a group, self-directed knowledge searching, group sharing of that knowledge, and then applying it. The author indicates that even though PBL has been highly scrutinized, questions remain concerning its effectiveness, so veterinary educators should rigorously evaluate development of their curricula. There are a number of recent articles in the library literature about PBL as it relates to health sciences libraries, but little mention of veterinary libraries in particular. A survey of Iowa State University College of Veterinary Medicine professional students revealed that a small group of students (ten) in an optional, experimental PBL program indicated that as a group they used the Web/Internet more frequently than other students; more of their courses required use of library print or electronic resources; and they showed the highest use of the computerized indexes (3). This is not surprising, given PBL’s focus on seeking, sharing, and applying information. The multiple roles of librarians involved in PBL are put into a framework of six activities by Jolene M. Miller, a medical librarian at the Medical College of Ohio, Toledo. Activities listed encompass assistance and instruction at the reference desk, course-related instruction, consultations with faculty and students, group facilitation, and resource management (which includes collection development) (4). Although the modest budgets and staffing of some VMLs may affect the degree of library participation in PBL, there will be opportunities for new and challenging roles that include direct involvement with faculty and students in the
PBL curricula, course related instruction in information seeking, and even the possibility of librarians serving as group facilitators, in programs that do not require that subject experts fill this role.

Evidence-based veterinary medicine (EBVM) as an adaptation of evidence-based medicine (EBM) is a relatively recent development in the veterinary profession. A sure sign that EBVM had “arrived” came in 2003 with the release of a new book that addressed the concept and practice, *Handbook of Evidence-based Veterinary Medicine* (5). The same authors, Cockcroft and Holmes, soon afterwards published a three-part series on EBVM in the veterinary journal *In Practice* (6-8). The first article in the series offers a definition (the use of current best evidence in making clinical decisions) which it contrasts with EBM (the integration of best research evidence with clinical expertise and patient values). Cockcroft and Holmes make several comparisons that account for the less exacting criteria at present for EBVM: existing evidence is greater in human medicine as are its resources, a broader approach is required in veterinary medicine because its literature base is much smaller than that of human medicine, and by necessity veterinary professionals are forced to evaluate poorer sources of evidence than their counterparts in human medicine. This is not to understate the importance or potential of EBVM. The authors report a growing body of opinion that EBVM is vital to the future of the profession, but this will require a dedicated expansion of the existing clinical evidence base both by and for veterinary practitioners. The authors state that the single most important source of information in EBVM is peer-reviewed journal papers, and touch briefly upon searching the PubMed/Clinical Queries, CAB, and Consultant databases. This would suggest an expanded role for librarians in database knowledge and evidence-based searching, and possibly in document delivery, as EBVM is accepted and adopted by faculty and students in veterinary colleges and ultimately by veterinary practitioners.

As a cautionary note, preliminary investigations into the EBVM-searching effectiveness of PubMed (9) and CAB Abstracts (10) by Sarah Anne Murphy found mixed results and the need for further studies. This would indicate a research area for veterinary librarians in exploring EBVM searching characteristics and efficiencies of databases, in addition to searching them and instructing in their use.

Meanwhile, EBM is going through its own changes and development within the medical profession. An interesting overview article traces the history of the medical sciences knowledge base, along with the evolution of the EBM model into Evidence-Based Health Care (EBHC) and now possibly into Evidence-Based Practice (EBP), all from the perspective of the health sciences library (11). The article’s authors suggest several new emerging roles for health science librarians that will be built around clinical knowledge-based systems, informatics, and instructional technology. At least some educators contend that it is unrealistic to expect most clinicians to make point-of-care decisions based upon the standard EBM approach. Instead, EBM instead needs to be taught to students, residents, and physicians within the larger context of information management (12). While EBVM will follow its own course within veterinary schools and the
profession, it is not likely to be immune to new EBM developments and trends within human medicine.

Yet another opportunity for those librarians with the inclination, time and necessary subject familiarity is in bioinformatics, and more specifically clinical bioinformatics and biomedical informatics, genomics, and proteomics. For example, there is presently considerable interest in searching non-bibliographic databases from the National Center for Biotechnology Information (NCBI) including Nucleotide, Protein, Genome, Structure, and others, all freely available and prominently linked from within PubMed. An excellent non-specialist introduction to bioinformatics, along with related scientific fields, their definitions and relationships, appears in a recent JASIST article (13). An attempt in the late 1990s by Smith and Williams to define the veterinary informatics knowledge base by identifying peer-reviewed biomedical literature indexed in the MEDLINE database found only 611 articles, but speculated that as the field grows there may be a need for “veterinary informaticians” to monitor the field and explore new ways of using computer and information science in veterinary medicine (14).

It would appear that as veterinary and biomedical information continues to increase at a rapid rate, along with a corresponding need to identify, locate, retrieve, deliver and manage it, and assist others in doing so, there will be a continued need for veterinary reference librarians. In addition to traditional responsibilities of reference and instruction, new opportunities for librarians are likely to be created by problem-based learning programs in veterinary colleges, the profession’s adoption of evidence-based veterinary medicine, and bioinformatics, to name a few.

**THE CHANGING FACE OF VETERINARY LIBRARIES**

With the explosion of medical knowledge and technology in the health fields, the need for access to information by health professionals, including veterinarians, has increased greatly in recent years. The Internet has brought veterinarians together for information exchange as never before through private e-mail and professional e-mail forums. Web sites and databases with professional information, and clinical practice Web home pages that include animal health information for pet owners are among the variety of Internet applications available for use by academic veterinarians and those in veterinary practices. Electronic resources have the advantage of being more current, and sometimes more comprehensive than comparable print equivalents. To best serve the newest needs of this community, VMLs must continue to focus on Web site and infrastructure development in order to improve the ability of their patrons to effectively access large collections of digital resources. In her article about the issues being faced by reference librarians, Carol S. Scherrer boldly stated, “The library used to be this gate keeper. Now the whole ballgame is access” (15). She presents the notion that reconfiguring the library to meet the needs of patrons NOT coming into the library should be the focus of libraries in the future. Knight and Brice see the future of health science libraries as being reinvented to be libraries without walls that act as filters of knowledge and as “center(s) of instruction in which to learn skills as well as access knowledge” (16). This notion is certainly compatible with the reality of non-academic veterinary practitioners who are physically
removed from VMLs, as well as veterinary academics and students who are increasingly computer literate.

The role of medical librarians is increasingly that of curriculum based instruction and outreach. As noted above, there are challenging opportunities for veterinary medical librarians to be involved directly with faculty and students in problem based learning instruction and in expert based learning. Dr. Thomson asserted that “[Veterinary] Students need to become information literate to the point where they understand the processes and systems for acquiring current and retrospective information. They need to understand how to use information storage and delivery systems”(1). He concluded by stating that graduate veterinarians who are well versed in expert based learning improve the overall quality of veterinary medicine offered to the consumer. The veterinary medical librarian can be instrumental in teaching and providing the basis of information to achieve this goal in the electronic environment. The Internet is not only bringing together veterinarians with the latest published information as never before: it can also bring together veterinarians with librarians who provide the latest published information as never before.

NOTES


