Computers for Clinical Practice—Not Yet, But Soon

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Today's family physician is expected to keep up with an ever-increasing flood of new medical information. More than 1600 different clinical practice guidelines have now been published, and over 360,000 new medical articles are added to *Index Medicus* each year. Obviously, keeping all this information straight is impossible, and studies of physicians' knowledge needs have shown that, on average, each physician encounters approximately one unanswered question for every patient seen.[1]

Computers, with their ability to store, analyze, and retrieve huge masses of data, would appear to be valuable tools for family physicians attempting to apply this growing body of medical knowledge to the care of their patients. The article by Ebell and colleagues[2] in this issue of the *Journal* suggests that the potential use of computers to meet practice information needs and to support clinical decision-making has not as yet been realized.

Why has the computer, which has revolutionized so many areas of modern life, had so little impact on the way family medicine is practiced? Physician intimidation by computers or unfamiliarity with their use, while often cited as a problem in the past, appears not to be the culprit. The survey by Ebell and colleagues shows that most physicians are no longer intimidated by computers, and use them for a variety of nonclinical applications. Nor is lack of evidence of the effectiveness of computers a problem. In a recent review, Balas et al[3] were able to identify 98 prospective randomized trials that evaluated the effectiveness of computers in improving medical practice. Eighty-five percent of the trials showed benefits in either the process or outcomes of care as a direct result of using computers. What appears to be lacking is a "killer app"—a new program or computer application that proves so powerful and efficient that it changes our ways of

thinking about what computers can do, as the development of spreadsheets did in the 1980s.

While no "killer app" is apparent at present, a number of recent developments in medical informatics show definite promise, and suggest that family physicians' use of computers to assist them in decision-making in their practices is likely to increase in coming years. These developments include the growing use and increasing sophistication of computerized medical records, the explosion of useful medical information on the Internet, and the rapid development of more powerful and useful palmtop computers.

While there have been many barriers to the implementation of computerized medical records systems in family practice,[4] their use is clearly growing. Not every computerized medical records system is able to assist family physicians in their information management tasks. Many of the currently available systems do little more than allow the recording of patient clinical data, and have no capability to provide prompts to action, reminders, or access to clinical guidelines or relevant information.[5] Even when medical records systems provide these functions, physicians may not find them helpful because of time constraints or concerns about the applicability of computer recommendations to the care of a specific patient.[6] These concerns are being recognized and remedied by the designers of computerized medical record systems.

An ever-growing amount of medical information is available online to the physician with a computer and a modem. The National Library of Medicine has made a major effort to simplify computer-mediated search of the medical literature in an effort to get the contents of MEDLINE to physicians and into clinical practice as quickly as possible.[7] While there are many success stories in which literature searches have led to new treatments and improved outcomes for patients, few physicians attempt to use MEDLINE to search for information that will aid in caring for their patients. The time required to do such a search remains a significant barrier, and even the most skilled searchers become frustrated when they can-

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not find an article addressing their specific question or find themselves overwhelmed when their search produces a large number of irrelevant articles.

This problem of excessive "noise" is even greater when the search to find useful medical information extends to other sources on the Internet. Fortunately, a growing number of Internet resources, such as *The Journal of Family Practice* Journal Club (http://jfp.msu.edu/jclub/indexes/jcindex.htm) and the Cochrane Library (http://hiru.mcmaster.ca/Cochrane/reviews.htm),[8] present relevant and valid medical information in a condensed format that greatly increases its usefulness to busy practitioners. In other fields, intelligent software "agents" roam the Internet searching through the great reams of material available to find only those few specific items likely to be of interest. While there are yet no software agents that are useful for family physicians, we can expect to see their development in the future.

One of the most impressive features of the computer revolution has been the ongoing ability of the industry to provide increasingly powerful machines in ever-smaller formats. This trend has now reached the point at which it is literally possible to carry around multiple medical textbooks in one's pocket in a "palmtop" computer. While some "pocket textbooks" with relevance to family medicine exist, the full potential of these devices will not be realized until programs become available that provide physicians with up-to-date medical information, practice guidelines, and clinical decision rules in a format that allows rapid access.

The article by Ebell and colleagues provides an important "snapshot" documenting the minimal use of computers by family physicians in managing their clinical information needs at this early stage. In 10 to 15 years, we may look back in wry amusement at the limited appreciation we had of the impact of computers on the practice of family medicine.

REFERENCES

1. Smith R. What clinical information do doctors need? BMJ 1996; 313:1062-8.

2. Ebell MH, Gaspar DL, Khurana S. Family physicians' preferences for computerized decision support hardware and software. J Fam Pract 1997; 45:137-41.

3. Balas EA, Austin SM, Mitchell JA, Ewigman BG, Bopp KD, Brown GD. The clinical value of computerized information services. A review of 98 randomized clinical trials. Arch Fam Med 1996; 5:271-8.

4. Rodnick JE. Computer-based medical records: time for an upgrade [editorial]. J Am Board Fam Pract 1994; 7:359-61.

5. Sullivan F, Mitchell E. Has general practitioner computing made a difference to patient care? A systematic review of published reports. BMJ 1995; 311:848-52.

6. Lobach DF, Hammond E. Computerized decision support based on a clinical practice guideline improves compliance with care standards. Am J Med 1997; 102:89-98.

7. Lindberg DA, Humphreys BL. Computers in medicine. JAMA 1995; 273:1667-8.

8. Becker L. The Cochrane collaboration. A valuable resource for family physicians. Can Fam Physician 1997; 43:403-4.