Computers in Family Practice

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Microcomputer-Based Patient Education Programs for Family Practice

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Personalized computers or microcomputers have altered irrevocably the ways Americans conduct business, play, educate, and even live. Medicine has also not been immune to the invasion of microcomputers. These machines have already proved they can perform many clinical and administrative tasks in physicians' offices.[1-4] In addition, despite some limitations, microcomputers have facilitated the analysis of data collected in family practice settings.[5] As technological improvements result in larger data-storage capabilities, more extensive applications of microcomputers for medical management and office practice will undoubtedly occur.

Patient education is one important area that will benefit from the increasing versatility of the microcomputer. However, as Ellis,[6] who pioneered the development of microcomputer-based education programs, pointed out, technological advancement is *not* the limiting factor in the utilization of computer-based patient education. The major issues that must be addressed are cost, efficacy, and acceptability. In addition, the limited current availability of software for health education is a major bottleneck. In this article, these issues will be addressed as they relate to family medicine.

In order to explore the use of microcomputers in patient education, a microcomputer-based patient education program was placed in the waiting room of an ambulatory family practice clinic. The major objective of this experiment was to assess the degree to which a microcomputer-based patient education program would be acceptable to patients and providers. An Apple II Plus with 48K of memory, dual disk drives, and a 21-inch color television serving as a monitor were conspicuously placed at one end of the waiting room. A color poster placed nearby invited those in the waiting room to try the microcomputer.

The software used in the study, "kardia," had originally been implemented on a mainframe computer and was converted for use on the Apple by one of the authors (JLB). "kardia" is an adaptation of the Michigan Heart Association's RISKO game for assessing predisposition to a heart attack and was designed for use and interpretation by a nonprofessional population. As formatted for the microcomputer, "kardia" required approximately 15 minutes to complete.

Based on the data collected from both "kardia" users (patients) and family physicians whose patients had been involved in the study, it was concluded that a microcomputer-based health educa-

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tion program was quite acceptable. The methods and results have been reported in detail.[7] This conclusion corroborates that of Ellis and Raines,[8,9] who conducted a similar study in a general medicine clinic waiting room. Thus, patient acceptance in itself does not appear to be a significant barrier to the use of microcomputer-based patient education programs in family medicine.

The three major factors currently inhibiting immediate adoption of microcomputer-based patient education programs are (1) software availability, (2) cost, and (3) evidence of efficacy. The first obstacle to widespread implementation of microcomputer-based patient education programs is the dearth of appropriate and high-quality software. Unfortunately, many of the commercial software manufacturers have yet to produce appropriate patient education programs. The best types of software appear to be those that have been developed by health professionals themselves for specific predetermined applications. Appraisal and widespread marketing of these programs are limited, however. If a variety of microcomputer-based patient education programs were available, family physicians would be more likely to "prescribe" them. These programs could either be viewed in the physician's office or lent for home use by those patients with access to a personal computer.

The cost of producing software for patient education is another concern for family physicians. Besides the cost of the software itself, the cost of purchasing a microcomputer and its peripherals (eg, television monitor) must also be considered. The cost of placing a microcomputer and one software program in an ambulatory medical setting is approximately $3,500. Once the equipment is available, each additional software program would cost from $15 to $50. Unless some of these costs could be recovered through third-party reimbursement (currently not permitted), or unless family physicians could simultaneously utilize the microcomputer for administrative and clinical tasks, a microcomputer-based patient education system would not seem to be cost effective.

A third unresolved issue associated with introducing microcomputer-based patient education programs is evidence of their efficacy in promoting health or in treating disease. Desirable outcomes include contribution to patients' knowledge of their health status, improved attitudes, enhanced compliance with therapy, and most important, behavioral changes. The "kardia" study was not designed to collect such evidence. Gathering evidence for the effectiveness of microcomputer-based health education programs will require further research, longitudinal data, and comparisons with alternative forms of patient education.

Nevertheless, in spite of insufficient evidence of efficacy, the novelty associated with microcomputers has increased physician interest in patient education in an ambulatory family practice clinic. Patient acceptance of microcomputers for health education is not a major problem. As more and more family physicians purchase microcomputers for their office practices, costs of providing microcomputer-based programs for patient education should decrease. Patient education is a promising area for the application of the computer in family practice.

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