
Computers in Family Practice

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The Computer and the Family Medicine Resident

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The dawn of the computer age has long since drawn to a close, and the contemporary family practice resident has certainly felt the effects of computers for the bulk of his or her adult life. Most family practice residents were selected for their positions with the help of a computer program, The National Resident Matching Program.¹ It is important to note that they were not *chosen*

by a computer; rather, the machine was used as a tool to convert the personal preferences of thousands of residency directors and applicants into a mutually acceptable list of assignments. The notion of the computer as a tool rather than as an independent actor in the lives of family practice residents will be the focus of this essay. Thus, the question confronting young physicians is not whether computers will be a part of medical practice in their future careers. They will. The question is how well physicians will prepare themselves to manipulate the information and use the data-processing capabilities computers are able to provide.

The computer already plays a major role in the professional lives of most family practice residents. A recent survey revealed that more than 80

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Table 1. Examples of Computer Applications in Family Medicine Residency Programs

Patient Care	Education	Administration	Research
Computerized test results	Direct interactive programs	Scheduling	Computer-assisted literature searches
Medication lists	Monitoring of patient care experiences	Experience documentation	Chart audits
Computerized problem lists	Patient education	Billing	
Computer-assisted diagnosis			

percent of family practice residency programs were either using or developing computer systems.² Current usage ranges from relatively straightforward administrative applications, such as billing, to sophisticated attempts to identify residents' educational weaknesses by monitoring their practice patterns. For instance, Given et al³ demonstrated that it was possible to recognize weaknesses in a resident's sensitivity to psychosocial factors presenting as emotional complaints by monitoring the frequency of diagnostic studies ordered. In one instance it was noted that a resident requested an inordinate number of upper gastrointestinal series, and a chart review suggested insufficient attention to psychological issues involving abdominal pain in his patient care. Although the computer is an inanimate, soulless machine, it can be a powerful tool to improve patient-oriented primary care. Young family physicians, who may not by nature be predisposed toward easy acceptance of new technologies, should recognize that the computer need not distance the physician from the patient.

Four categories in which computers have major applications in family medicine residency programs are delineated in Table 1. The daily activities of the average resident are perhaps most affected by patient care applications. Any resident who has been forced to retrieve laboratory results by either foraging endlessly through hospital laboratories or haggling with harried technicians on the telephone will appreciate the convenience of computer terminals with current laboratory results placed throughout the hospital. In many hospitals, computer-generated medication lists make the

house officer's daily administrative and patient care tasks somewhat easier. An interesting approach taken by a British training program involves a computerized clinical information system for house officers designed to provide assistance with the management of common clinical problems of hospitalized patients.⁴

The topic of computer-assisted medical diagnosis attracts a disproportionate share of interest compared with its current level of sophistication. The construction of a differential diagnosis from clinical data is exceptionally complex, and even the best available computer programs for medical diagnosis do not fare well compared with clinicians.^{5,6} Although the computer as clinician has not yet matured, the possibility that computer-assisted diagnosis will be the standard of care in the future has been suggested.⁷ It is somewhat humbling to contemplate the possibility of being culpable for missing a diagnosis or therapeutic strategy that a computer would have recognized. Currently, however, computer-assisted diagnosis plays a negligible role in family practice residencies and is likely to remain primarily within the arena of the researcher for several years to come.⁸

Educational applications of computer technology are burgeoning and will doubtlessly enrich teaching programs in residencies within the decade. Although the interactive capabilities permitted by computers are intuitively appealing, uncritical acceptance of educational software is a pitfall that must be avoided. The information packaged for the consumption of video-age learners may be as inaccurate, out of date, and misleading as that in any written text. The obligation to

prove that computerized education is more effective, cheaper, or generally more palatable than more traditional teaching techniques lies with the creators and advocates of the technology. In fact, there is some evidence that computer-based instruction in medical education is not necessarily superior to other modalities.⁹

Some family medicine residencies utilize computer-based systems to monitor residents' patient care experiences and management capabilities. One commercially available program* allows residents to compare their clinical experience with a detailed set of performance and knowledge standards designated by residency faculty. Whether such techniques are superior to pencil-and-paper methods or occasional experience reviews with preceptors remains to be seen.

Although many administrative applications of computers, such as billing and word processing, seldom affect residents directly, there are a few significant exceptions. Some residencies utilize computer programs for the scheduling of rotations¹⁰ or to keep residents aware of patient appointment schedules.¹¹ Because of the importance of experience documentation for obtaining hospital privileges, some residencies have chosen to maintain computerized records of residents' learning activities.¹² At the University of Washington Family Medicine Residency Program, a computer listing is available for all procedures performed in the Family Medical Center along with age, sex, and diagnosis listings for all patients seen in the clinic during residency.

As research training becomes more prevalent in family practice residencies, so does the utilization of computers for resident research. Most research projects include a search of the available medical literature, and the MEDLINE computer literature search system offers clear advantages in efficiency and time over manual methods.¹³ Katherine Barber, librarian at King County Medical Society Library Service (personal communication, July 1983) notes that about 60 literature searches per year are performed for family medicine residents at the University of Washington Family Medicine Residency Program by the program's medical librarian. The utility of computers for

research involving panels of patients with specific diagnoses or receiving various drugs or having specific demographic characteristics is obvious. Because many resident research projects involve chart audits, the computer can indeed be a valuable tool for residents.

The computer is firmly entrenched in family medicine residency programs, and in medicine in general. To achieve the computer literacy necessary for intelligent use and understanding of this technology, it would be wise for training programs to develop instructional modules in the medical applications of computers. Both the Society of Teachers of Family Medicine and the American Academy of Family Physicians have organized task forces to study computers. Perhaps they will provide guidance for residency training. In the meantime, family medicine residents should begin to make their peace with computers, for they will doubtless add some complexity to our lives, but will be much more manageable as allies than as foes.

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