health care, give scant attention to psychosocial health. Whereas the purpose of quality assurance activities is to guarantee that high quality medical care is delivered, there is a failure to address psychosocial dimensions of quality, factors long recognized as important by health care consumers.[8]

Family physicians, who have special expertise in the area of psychosocial medicine, are in a position to influence quality assurance activities in their communities. It is essential to include psychosocial evaluation when quality of health care is being measured in the following areas: health maintenance, psychiatric illness, chronic or life threatening illness, illness that demands a change in lifestyle, and instances of psychological or social breakdown in patient or family.

Experience in the field of psychosocial health care evaluation is limited. Because most quality assurance activities focus on the medical record, and because psychosocial data are frequently not recorded in the chart, it will be necessary to develop alternative methods to evaluate psychosocial health care. In their hospitals and practices, family physicians, by recognizing psychosocial dimensions of health, can develop and experiment with innovative methods of health care evaluation. Some alternatives to traditional quality assurance studies include gathering of information directly from patients, evaluation of non-technical dimensions of health care quality (eg, art of care, continuity, patient satisfaction), direct observation of physician- patient encounters, and assessment of psychosocial outcomes (eg, quality of life). By assuring that all aspects of health care quality are being adequately assessed, such contributions by family physicians would be invaluable to the quality assurance field and to the health care consumer.

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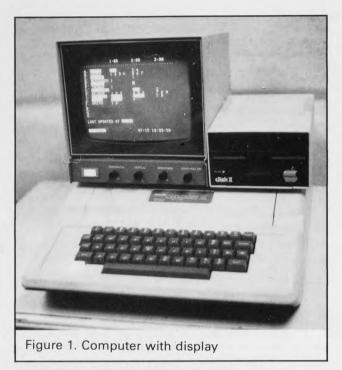# Use of a Microcomputer in a Family Practice Residency

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The Family Practice Residency at General Hospital has 32 residents, all seeing their outpatients in the Family Care Center adjacent to the hospital. The schedule of the center is complex, and residents' hours for seeing patients are staggered to better utilize existing room limitations. Good communication between the center and the residents is vital if efficient patient flow is to be maintained. During the day, when the residents are not in the center, they are occupied with duties in the main hospital building. Thus, it was felt that an efficient, ongoing communication system between the family care center and the hospital would be indeed beneficial.

With as many as 35 physicians using the center to see patients each day, physical limitations were a key factor. A major problem was the large volume of telephone calls coming into the center from the residents, requesting information about their patient schedule for the day. These calls, together with the many telephone "pages" from the center

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Figure 1. Computer with display

resulted in frequent, time-consuming interruptions for the nursing staff, taking them away from their nursing duties to use or answer the telephone.

The use of an inexpensive microcomputer, located and programmed in the family care center, was explored for the purpose of displaying the patient schedule over the existing hospital television system and to act as a dynamic message board. The advantages of the system were felt to be several, including: (1) communication of the schedule to residents without the use of paging; (2) ability of the system to expeditiously make adjustments in the schedule almost immediately; (3) freeing nurses in the family care center from the time-consuming chore of repeatedly answering the telephone to talk with residents about their patient schedule; (4) significantly decreasing telephone calls and "pages" from the family care center to the hospital; (5) improving patient flow in the center by more efficient use of nursing time; (6) helping residents budget their time by providing rapid access to a constantly updated schedule; and (7) displaying the midday conference topic as well as notifying residents of messages.

Methods

The system utilized is a readily available personal computer. The Apple II,* a commercially

*Apple II is a registered trademark of Apple Computer, Inc

available microcomputer which can be connected into the hospital television system and which then will display the schedule, is used here. The schedule is "entered" by the secretaries in the family care center in a matter of a few minutes at the start of the day. Updating is done throughout the day and requires only a few seconds. The residents are notified when needed by "flashing" their names on the screen. The computer also indicates when a patient arrives, when he or she is ready to be seen, and when the resident is present in the family care center by means of "flashing" the corresponding name. The daily conference topic can be displayed as well as important messages.

One unique feature of the system involves its updating ability. By "flashing" the patient number, one can inform the physician of the arrival of a patient at the center. Cancellations can be "cleared" from the screen and "add-ons" included in seconds. A clock display in the lower right corner of the screen assures the residents of current information by noting the time of the most recent update. With television sets already available throughout the hospital, the computer system was easy to initiate. The computer with monitor is pictured in Figure 1.

Telephone calls to the family care center by the residents relating to their patient schedules were monitored for four weeks prior to the installation of the computer system. Also, all pages from the center regarding the schedule were counted. At the end of this time, the computer was instituted and each resident instructed in its operation and availability. During the subsequent four weeks, telephone calls and pages were again tabulated.

Results

The comparison of calls before and after the computer system showed a reduction of over 200 calls in the first four weeks of the computer's operation from 536 to 324 calls, a 40-percent reduction. A confidential survey of the residents and staff regarding the computer display showed overwhelming approval.

Comment

The introduction of the microprocessor within the last few years has made inexpensive small computers available to the general public and small businesses. Since about 1975, these versatile machines have found their way into thousands of

homes, helping their owners in a variety of ways, from keeping track of checking accounts to monitoring lawn sprinkler systems. A key factor in the popularity of the computers is the ease with which they can be "talked to" using a readily understood, high-level computer language known as BASIC.* This language uses words and phrases which are entered into the computer via a typewriter-like keyboard. This makes it possible for anyone to operate a computer without knowledge of traditionally esoteric computer languages.

The use of a microcomputer to transmit the family care center patient schedule over the hospital television system has proved to be a real aid to communication. The system provides continuous, up-to-the-minute information for the residents, informing them when patients have arrived and are ready to be seen. It even "calls" the resident at the appropriate time. Messages can be relayed to residents, and the midday conference topic displayed via the computer. Those using the system

*BASIC—Beginner All-Purpose Symbolic Instruction Code

feel it to be beneficial in helping patient flow and time budgeting.

A computer can be purchased for under $1,000, with peripheral hardware costing approximately $500-600. An additional cost is involved to connect the computer to the hospital television system.

Since its introduction, it has become increasingly clear that the computer will have a number of other applications in the family care center, including data retrieval and research. The system is adaptable to any hospital with a television system, and its low cost and varied uses make it an attractive addition to a residency.

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An Improved Encounter Card for Documentation of Clinical Experience

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For previous reports of clinical experience recorded by medical students at Duke University Medical Center,[1,2] the data were collected using E-cards.[3] For computerization the information was coded and transferred to data summary sheets from which keypunching was performed. For the past two years students have been using an improved encounter card from which keypunching is done directly, thus simplifying the process by eliminating the time-consuming summary sheet.

The new encounter card (Figure 1) measures 3×5 inches and is printed on both sides. For each patient seen, the student fills out the left-hand half of the front and back. The cards are submitted at intervals and coded by clerks on the right-hand side. Then keypunching is done directly from the coded cards. A similar card which includes procedures done, as well as problems seen, is available

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