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# Computers in Family Practice

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## Teaching a Core Curriculum in Rural Family Practice Preceptorships Using Microcomputers

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The third-year Family Practice Preceptorship at the University of South Alabama is a six-week experience that allows medical students to spend the entire rotation with a practicing family physician in various sites throughout South Alabama. The major portion of the experience takes place on a one-to-one relationship with the preceptor in his clinical setting. In addition, formal teaching sessions are conducted on several occasions during the rotation by the course director and other full-time faculty members of the Department of Family Practice. A description of the preceptorship has been detailed elsewhere.<sup>1</sup>

From data that have been gathered over the past several years on the preceptorship experience, it has been shown that student experience varies considerably from season to season, and from preceptor to preceptor. Given this problem, a core curriculum of the ten most frequently seen diagnoses in a family practice office setting was developed. The selection of these ten diagnoses was based partly on the Virginia Study<sup>2</sup> and partly on an epidemiology study done at the University of South Alabama.<sup>3</sup> These various diagnoses were

incorporated into a computer-assisted instruction (CAI) program using the MED-CAPS system, which is an interactive clinical problem-solving system.

### Program Details

Ten Apple IIe microcomputers were purchased, one for each student on the preceptorship. The computers are individually assigned for the six-week period to each student, and each student is then able to transport the system to the community setting in which he or she will be located. The MED-CAPS cases include hypertension, urinary tract infection, upper respiratory tract infection, diabetes, vaginitis, obesity, anxiety, depression, pneumonia, and otitis media. A contractual agreement was arranged with the Health Sciences Consortium in Carrboro, North Carolina, for the development of the necessary software for the MED-CAPS cases. This system is designed for use on the Apple IIe and tailored to department specifications to present a comprehensive picture of the diagnoses mentioned above.

The MED-CAPS program itself is tailored to various clinical vignettes. It provides listings of past medical history, physical examination, and laboratory test results for each of the ten hypothetical patients. Each separate diagnostic prob-

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lem consists of two floppy disks; the first is the case driver disk, which is common to all problems, and the second is the diagnostic problem disk, which is unique to each particular clinical problem.

At the beginning of the preceptorship, each student is provided with complete instructions at the computer terminal about the use of the computer and the MED-CAPS system. Information regarding objectives is provided to the student, who then proceeds with the workup of the patient problem. Instructions and explanations given by the computer are explicit, requiring no particular keyboard or computer expertise. The MED-CAPS diagnostic workup is interactive and multidirectional, enabling the student to request and receive the patient's past medical history, review of symptoms, family medical history, growth and development, social history, physical examination results, and laboratory tests.

The program provides prompt feedback on diagnostic accuracy, the approximate time needed for the workup chosen by the student, the total cost of the tests ordered, and the risks and implications of procedures used. Knowledge of all these factors allows the student to form a realistic picture of the proper approach to treatment. The program is flexible; it provides branching to various topics and allows return to previously studied material which reinforces concepts and enhances the student's participation and interaction with the computer. Discussions of correct and incorrect diagnoses are also integrated into the program, giving immediate feedback.

The students are asked to keep a log of each completed case, including the name of the case, the time spent working on the case, the diagnoses entered by the student, the correct diagnosis according to the computer, and the time and cost calculated by the computer. Data collected from preliminary student surveys reveal that each case requires an average of 30 minutes to complete, which means approximately five hours are needed during the rotation to spend with the cases.

A workshop was held at the University of South Alabama to introduce the preceptors to the use of the microcomputers and the rationale for computer-assisted instruction. There was opportunity for questions about computer use and time for hands-on experience with the machines and their programs. As a whole, preceptor attitude toward

the introduction of CAI has been favorable.

## Comment

Computer-assisted instruction provides a reproducible, standardized learning experience for students<sup>4</sup> and enhances problem-solving skills. The use of computer-assisted instruction is in no way meant to substitute for actual patient contact, or for contact with the student's preceptor. It does, however, provide instruction that augments the learning experience.<sup>5</sup> The use of the computer-assisted instruction programs assures that the students will be exposed to problem solving and discussions of the most common problems seen in a family practice office setting.

At the computer terminal, the student is allowed flexibility to make any decision at his or her own pace and to learn immediately the consequences of that decision. The real time factor in usual patient care is reduced to a minimum; that is, the progression of a chronic disease over a period of years is compressed into an overview that takes only minutes at the computer terminal.

A survey of all participating students is being conducted to assess the effectiveness of the CAI program. The collection of these data, as well as continual upgrading and expansion of CAI programs, are planned for the near future.

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