

² Renaud, S., Godsey, F., Orchanian, E., and Boudier, F.: *Table de Composition des Aliments*. Paris, Astra-Calve Ed., 1976.

³ Paul, A. A., and Southgate, D. A.: *The Composition of Foods*, 4th edit. London, HMSO, 1978.

More on SMBG Techniques

I read with fascination the article entitled "Use of Tactile Techniques for Self-Monitoring of Blood Glucose in Visually Impaired Patients with Diabetes Mellitus," which appeared recently in *DIABETES CARE* (1984; 7:313-17). Knowing that independent control is a key issue for blind diabetic patients, I was very impressed with the attempts to design and evaluate tactile techniques that enable legally blind patients to self-monitor blood glucose.

Boehringer Mannheim Diagnostics, Bio-Dynamics Division, was approached by The American Foundation for the Blind with the request to design and develop a system that visually impaired patients could use to reliably test their own blood glucose levels. I am very happy to report that we honored the request and are now ready to introduce a system called Reflocheck-S.

The Reflocheck-S is a complete, speaking blood glucose monitoring system. It contains a sampling device equipped with a photo detector that virtually guarantees a standard size blood drop and its precise placement on a test strip. When the drop is detected, it signals the start of a timing cycle. In addition to a reflectance photometer, a voice synthesizer provides audible step-by-step instructions, timing announcements, and results. To allow for an accurate, easy to accomplish calibration, a lot specific bar code is attached to each test strip. All necessary components are contained in a carrying case and operate on either house current or batteries.

The system was evaluated and modified based on inputs from blind patients throughout its development. The final design was tested by 67 patients, 44 of whom were visually impaired or blind. A comparison to the reference hexokinase method resulted in a correlation coefficient of 0.988, a slope of 1.01, and an intercept of 5.12 mg/dl.

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Microcomputers in Diabetes Management and Education

In addition to the letters of Morrisett¹ and Rodbard et al.,² we would like to present our package for clinical applications at a diabetes center. This package operates on an eight-bit

microcomputer, with a CP/M compatible operative system and a mass memory of at least five megabytes. (We use a DMD 1000, DMD Computers, Torino, Italy.) The package uses a compiled Basic and a DBMS (Data Base Management System).

The following uses are offered:

1. Fully automated diabetes record for in-patients, with many facilities: print, statistical analysis, updating, etc.

2. Management of out-patient clinic, with two different procedures:

(A) Slave units to be given to the patients involved in a regimen of self-monitoring of blood glucose (SMBG), to collect routine daily parameters (blood sugar, glycosuria, and ketonuria, meals, hypo- and hyperglycemic episodes, etc.). The slave unit is connected to the master unit at each visit to the center, and data are displayed and graphically printed. Individual data are stored on the patient's floppy disk.

(B) A program for storing data collected during periodic consultation at the center for patients without slave units. Future appointments and exams (fluoroangiography, microproteinuria, etc.) may be pre-planned.

3. Computer-assisted instruction (CAI). Two programs for continuous diabetes education, in a global approach to the patient, are available:

(A) EDICO1. A questionnaire for self-appraisal of basic information, with 20 multiple-choice questions covering principal knowledge and skills. Explanations are displayed when wrong answers are provided.

(B) EDICO2. A second-level questionnaire for assessment of behavioral attitudes in patients on SMBG with 10 multiple-choice questions. Lateral fluxes are activated by unsatisfactory answers. Results and patient's comments may be stored for evaluation and education of the teaching team.

4. Other utilities. Several routines for medical guidance in clinical conditions, such as autonomic neuropathy and diabetic coma (monitoring of plasma osmolality, hemo-gas analysis, actual fluid deficit, etc.).

The package has been proved useful and user-friendly in the management and education of diabetic patients. Revision and further development of the programs are in progress.

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¹ Morrisett, W.: More on patient education: use of microcomputers. *Diabetes Care* 1984; 7:105.

² Rodbard, D., Pernick, N., and Jaffe, M. L.: Diabetes data management program available for microcomputers. *Diabetes Care* 1984; 7:401-402.