

# Development and Evaluation of a Computer Genogram

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The use of computers in primary care is an area of growing research interest. Already widely used for accounting, billing, and scheduling, computers are increasingly being used for the storage of medical records. The advantages of such a system are quick access, compact size, legibility, and the ability to manipulate stored data.

The family history is an important part of any medical history, and a genogram provides an efficient means of recording this information,<sup>1-3</sup> especially in the family practice setting. At a glance the physician may know the patients' past and present relationships, previous medical and surgical conditions, and whether certain diseases are prevalent in the patient's family. Other information, such as substance abuse history, other household members, and conflictive or overly close relationships, can also be included according to the clinician's special interests.<sup>4,5</sup>

Because self-operated interactive computer systems have been shown to be successful in terms of patient acceptance,<sup>6,7</sup> it was felt that the family history could be obtained in this way. The goal of this study was to write a patient-operated, interactive computerized genogram program for IBM-compatible systems, and assess its acceptability by patients. The genogram generated by the program was designed to serve as a template for the physician's use. Its purpose is to capture information concerning the patients' birth dates, ages, diseases, and basic relationships to augment and standardize the family history taken by the physician. Acceptability of the program was determined by patients' responses to a questionnaire, completed after their experience with the program.

## METHOD

A patient-operated interactive computer program was written in BASIC for use on an IBM PC or compatible

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computer. The genograms generated by the computer displayed four generations, current and previous marriages, up to eight siblings, up to 11 children, and any medical or social conditions that the patient wished to include. It also specifically asked for a history of cancer, stroke, heart disease, angina, diabetes mellitus, and hypertension in each family member. The program checked for data-entry errors and inconsistencies, and provided appropriate reinstruction when a mistake was detected. The data were stored in a database on a disk, allowing regeneration of a previously stored genogram.

The sample included patients from 16 to 60 years of age at the Family Practice Center of the University of Michigan in Chelsea, Michigan (population 3,800). Patients who were new to the clinic or who did not have a previous genogram in their chart were approached for inclusion in the study by the research assistant. The amount of time required to complete the interaction was recorded. Following the interaction, the patient completed a questionnaire regarding his or her educational level, prior computer experience, and overall impression of the experience.

## RESULTS

Of the 50 patients approached to take part in the study, 48 agreed to participate. Every patient using the computer was able to generate at least a partial genogram (Figure 1). The average genogram contained 11 family members, including an average of three siblings and two children. The average number of medical conditions recorded per genogram was 7.4.

Acceptability (as measured by the rating of the computer experience as very unpleasant, unpleasant, pleasant, or very pleasant) was correlated with age, educational level, prior experience, and personal computer ownership; no statistically significant relationship was found. Overall the program was found to be pleasant or very pleasant by 94 percent of the patients. Most patients (60 percent) had no more than a high school education, and 40 percent had



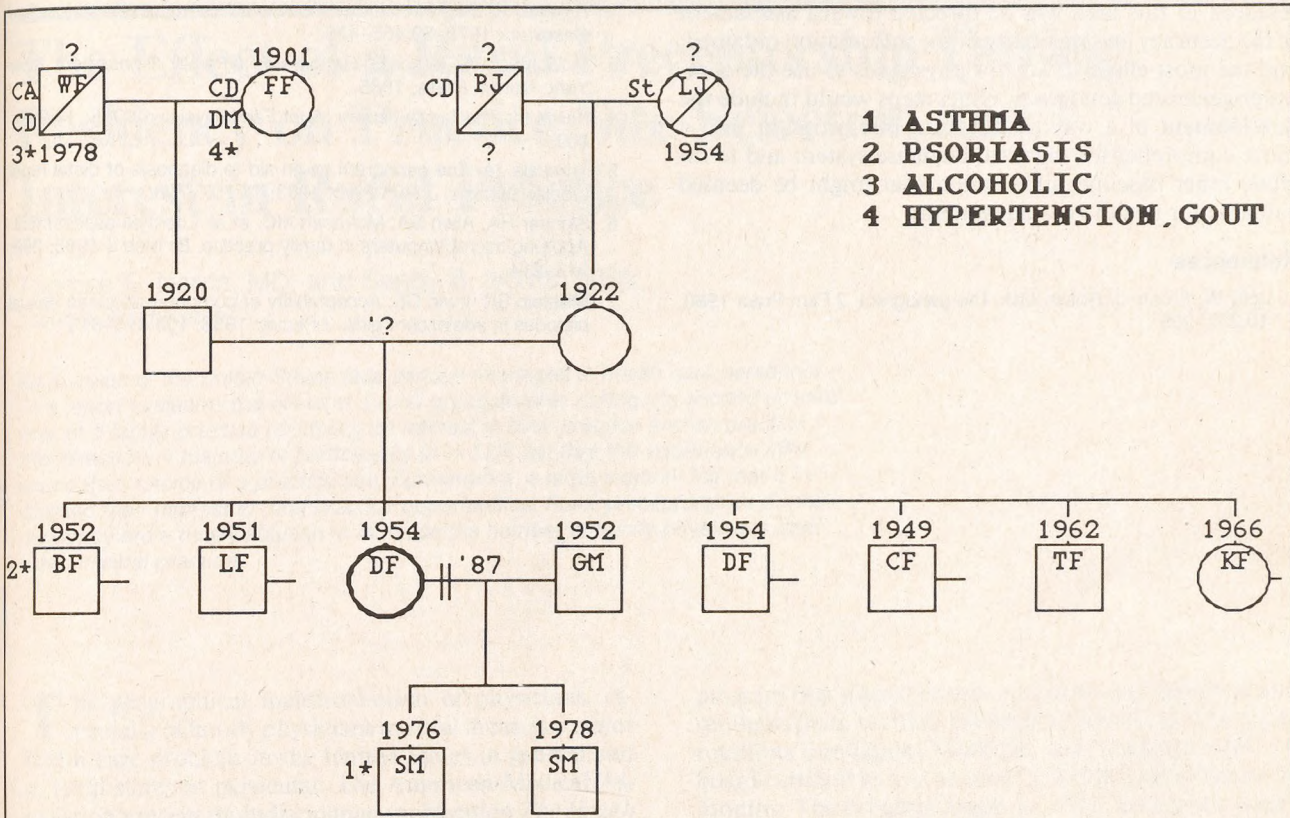


Figure 1. Sample genogram generated by a patient during the study. Key: CA—cancer, CD—cardiac disease, DM—diabetes mellitus, St—stroke, Ht—hypertension, n\*—other diseases. Dates of birth, death, marriage and divorce, if known, are indicated. A short line on the right side of a box or circle indicates that the individual is married; a slash through the box or circle indicates that they are deceased. Vertical hash marks indicate a divorce

no prior computer experience. Only 15 percent were uncomfortable with the idea of entering confidential information on a computer. Home computers were owned by 15 percent of the patients. The average length of time to complete a genogram was 18.7 minutes, with a range of 9 to 55 minutes. Only 10.4 percent felt that the program took too long.

**COMMENT**

The results of this study suggest that a user-friendly, interactive computer program can be successfully used by most patients to generate a genogram containing important family history information. For the vast majority of patients the experience was a pleasant one and did not take too long. It is encouraging to note that as many com-

mon nonusers as frequent users of computers rated the experience pleasant, and that the age or educational level did not affect the patient's acceptance of the program.

One important advantage of the computerized genogram is that it is standardized. Once a physician becomes experienced with the program, he or she knows that certain diseases have been addressed. In this program heart disease, hypertension, stroke, cancer, and diabetes are specifically queried. By doing the routine work of asking the patient about birth dates, ages, diseases, and relationships, the computer frees the physician for more time to cover such areas as substance abuse, depression, and relationships between family members. In this way the computer program is meant to facilitate the process of taking a family history, but not replace physician involvement.

The results of this study support further investigation and application of the computerized genogram. Additional



research in this area will be directed toward assessment of the accuracy and reliability of the information obtained, and the most effective way for physicians to use the computer-generated genogram. Other steps would include the development of a way to integrate this program into a more comprehensive medical database system and to include other baseline information that might be deemed valuable for health risk assessment.

**References**

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