AUTOMATED CLINICAL RECORDS

Ulett, George A., M.D. and Spitzer, Robert L., M.D.
with assistance from
Sletten, Ivan W., M.D.,
and Endicott, Jean, Ph.D.

1. Definition

The term "automated clinical records" refers to the recording, storage, and retrieval of information about patients in a form available for processing by electronic or mechanical devices. Today, the term generally implies the use of computer systems. Several systems with multiple facilities linked to a central computer now exist, or are being developed, which involve either single hospitals, individual states or several states. In some systems the traditional clinical record is unchanged, and the information is simply stored or first coded and then stored in the computer. In others there is no paper record or chart, and information is transmitted directly from and to the clinician by his interacting with a terminal device connected to a computer. In these systems, a permanent copy is generated only when needed, as in communicating with another facility.

2. Input

2.1 Type

The information that enters the system (input) can be introduced in a number of ways. The information can be in narrative form as a direct statement or, more commonly, first converted into pre-coded categories. The latter can be true-false statements, scaled judgments reflecting intensity or severity of some trait, or multiple choice items. Precoded items need not be limited to simple concepts; any concept that can be defined can be translated into a pre-coded form.
2.2 Processing

There are many methods for getting information into the computer, including key punching from a narrative or any type of data form, optical scanning of specially designed pre-coded forms, typewriter console, and visual display devices (cathode ray tubes) that can receive information through a light pen or by physical contact with the finger of the person supplying the information.

3. Sources of Information

Automated clinical record systems facilitate the use of information collected directly from the patient himself, from family members, or from other informants by means of pre-coded questionnaires. In addition, they lend themselves to the collection of certain kinds of information by trained technicians, thus saving professional staff time.

4. Storage and Retrieval

The more commonly used systems permit storage of the data in a central data bank, which can consist of either cards, magnetic tape, or disks that permit rapid access to individual records. In the latter case, it is possible at a terminal to obtain immediate information about a specific aspect of a patient's condition or status.

5. Output

5.1 Type

For some systems the input document, or a copy, also serves as the definitive medical record. In most systems, however, the computer generates a report that can either serve as a permanent printed record, which becomes the medical record, or the information is shown on a visual display device. The information can be presented in narrative form (even though the input information may have been in coded categories), as a listing of the information. If the input is numerical, it can be presented as scale scores or graphs.

The output information for a given subject can contain more data than was present in the raw input data. For example, output information may contain change scores over time, comparisons with other groups of patients, and suggestions for patient care based upon the comparison of this patient with previous patients given a variety of treatment modalities. (This latter use is discussed under Assessment and Treatment Techniques.)

5.2 Processing

The same methods are utilized for output as for input. The output can involve individual patients or groups of patients, as for example, patients from a given ward or from a hospital with certain demographic features, etc.

6. Use of System

6.1 Clinical

Automated clinical record systems can replace the traditional system of record keeping so completely that there is virtually no information on the record that is not available for electronic processing. At the other extreme, the system can be added to an existing traditional system. For example, the clinician might fill out a mental status automatic form in addition to dictating his usual mental status examination. However, this kind of double work is always resented. Most likely, future automated systems will replace portions of the clinical record, while still permitting additional comments and information that is not in a pre-coded form. For example, the clinician may wish to add additional information to supplement the pre-coded mental status examination. Some systems permit this information to be entered as narrative (via a typewriter) through the computer terminal. Other systems permit the clinician to write some comments that will be part of the medical record but that are not available for computer processing.

6.2 Research

For a variety of reasons, the traditional clinical record is practically useless for research purposes. If the information supplied to an automated clinical record system is of sufficient
7. Rationale for Automation

There are several reasons why there is considerable pressure to automate the traditional method of recording psychiatric case records. Automation can reduce the clinician's time in getting information into and out of a record; it also simplifies information retrieval for an individual patient or for summary data about groups of patients. An automated record keeping system can also provide the clinician with data not usually available to him from traditional clinical charts; and, thus, help him with decisions about the patient's diagnosis, management, and treatment. Finally, information from an automated record keeping system can be of great value to the administrator or researcher, who usually has great difficulty retrieving information from traditional clinical records.

8. Issues

8.1 Confidentiality

The issue of confidentiality relating to data banks in general is discussed in another section of this report. Although automated systems create problems in the protection of confidentiality, many have pointed out that current nonautomated clinical record systems are far less than foolproof. It is sometimes possible in hospitals for various persons to have ready access to the confidential clinical information by merely presenting themselves and requesting the patient's chart. With an automated system it is more feasible to put reliable safeguards against such access by unauthorized individuals. This can be done (1) by using assigned code numbers or various physical characteristics detected by sensing devices to identify individuals who are authorized to have access to the system and by permitting only certain types of information to be entered or referred by specifically designated staff members, and (2) by limiting the accessibility of certain kinds of data to certain terminals (e.g., business office terminal can not have access to psychiatric history information).

8.2 Legality

Data entered through precoded systems can be considered a legal medical record entry if the identity of the person entering the information is noted and if the person making the entry has been authorized as responsible for the patient's care.

8.3 Training

Opinion is divided about the impact that the use of precoded standardized forms will have on the training of clinical personnel. Some feel that training will be improved because of increased attention to definition of terms, comprehensiveness of coverage, and the results of instruction in the use of the specific forms. Others feel that training will be adversely affected because of the inhibition of spontaneity and creativity both in the interaction with the patient in obtaining the information (e.g., trainees will only observe what is on the form) and in becoming too dependent on the form for structuring of thinking. It may well be that in some settings the training will deteriorate, but in most settings it will be improved. The best way to avoid a negative effect on training is to develop and use forms that encourage clinicians to make careful and pertinent observations rather than merely to record preconceived notions into stereotyped categories. In addition, we caution against limiting training programs to teaching student psychiatrists how to complete standardized forms.

8.4 Standardization of Forms

Standardization of forms and computerization go well together — the former makes processing easier, the latter acts as a reinforcement for the administrative edict to standardize. There are many advantages to standardization. Findings can be more easily compared between centers, and development of items and forms can be facilitated with a reduction of costly duplication of effort. As a variety of output reports are developed, they can be more widely and generally disseminated. For example, as the data base is analyzed to provide computer aided suggestions regarding patient behavior and outcome, these suggestions can be made generally available.

Complete standardization of all items and forms is proba-
bly not possible and may even have some disadvantages. Some items will not be of use as significant predictors of behavior. Also, since patient populations differ from institution to institution, some items may be more useful in one setting than another. Finally, even in the most definitive system, forms must be left open-ended. It will be necessary to search constantly for new items that carry more information and are better predictors.

At this time, however, a set of core items satisfactory to most centers could probably be established. As one example, there appears to be considerable overlap from one center to another regarding the mental status items.

With administratively independent organizations, it will not be easy to standardize. Geographically separate workers do not regularly have the opportunity to exchange views, to discuss common problems meaningfully, or to discover that others are working on these problems. Collaboration on forms will then involve travel for which funds may not be available. Institutions and administrators may have trouble getting their own organization to accept forms from outsiders. Also there is a pride of ownership in building one's own system, a psychological reward not easily put aside.

In order to facilitate collaborative efforts toward standardization, the APA could establish a committee to assist centers toward this goal.

9. Cost

At present, automated record keeping systems are expensive. Even the cheapest systems are more expensive than the existing ones that they replace. However, the additional cost can be justified by considering their greater potential for improved records, improved patient care, savings in professional time, and value for research. Also standardization of forms, procedures, programs, and equipment will eventually reduce costs and increase the benefits.