Electronic Sign-Out Using a Personal Digital Assistant

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Providers of care depend on information to make decisions that affect the health and quality of life of their patients. This information is typically recorded in the medical record, which documents subjective and objective signs and symptoms, assessment, and course of action. In the inpatient psychiatric setting, the patient's chart is used by many providers of care, including nursing staff, recreational therapists, medical students, pharmacists, physicians, and mental health clinicians.

This column describes the use of technology to help meet this need for information. We have found a personal digital assistant, the Palm Pilot, to be very useful in transmitting, storing, and retrieving information needed for the continuity of patient care at the Sacramento County Mental Health Treatment Center in Sacramento, California.

Background

The Sacramento County Mental Health Treatment Center is an 82-bed public mental health hospital that serves the chronically mentally ill population of Sacramento County. It has four treatment teams at two nursing stations in the hospital. Each team consists of an attending physician, a resident, two or three medical students, a nurse, two mental health clinicians, mental health workers, and a discharge planner. The team provides care for the patients in conjunction with recreational therapy staff who work with patients of all teams. Each patient has a chart at the nursing station, which is used by all team members.

Sign-out is the information necessary for continuity of care that is transferred from the physician going off duty to the one coming on. The hospital has an official sign-out procedure for charts, but because of the large number of users, the procedure has been difficult to enforce. The general policy is to return the chart to the rack when finished. At times, however, finding the chart is difficult, which causes frustration and wasted time. The hospital is busy, with nearly a full census of patients every day. On average, each treatment team has about 18 patients a day, with an average of three new patients a day per team. Keeping track of treatment goals and pertinent history is a challenge with such a large number of patients (1).

In one of the teams, two attending physicians work part-time, with one working Monday, Tuesday, and Friday and the other working Wednesday and Thursday. Both physicians need to learn relevant information about each new patient, and they must also keep abreast of any changes in the treatment plans of continuing patients. It was necessary to develop a portable mechanism to sign out such information rapidly.

Traditional solution

In the past such summaries were typed in a word processing program, Microsoft Word, and printed from a desktop computer. A brief description of the patient was given, along with the particular tasks to be accomplished. Although the physician coming on duty found this information sufficient, the paper format was somewhat restrictive.

Several problems arose with the above process. The information added by the physician going off duty was typed in a new paragraph below the previous information. After a period of time, the amount of information and the constant revisions made the process unwieldy. Also, the format was rather unstructured, and time-consuming editing was required to organize the information alphabetically by patients' last names for faster lookup.

Another problem was the need to retrieve information about patients who returned to the hospital. The patient population has a high return rate, and being able to review past information would save time and facilitate care. Retrieval was difficult, because the information was located in a Microsoft Word document of discharged patients that had the same unwieldy editing and retrieval process.

Novel solution

The physicians on the team could use their personal digital assistants (Palm Pilots) (2–4) to organize the information for easier retrieval. Information was copied from the Microsoft Word document and transferred into the Palm Desktop software. The data can be synchronized between the desktop personal computer and the personal digital assistant—that is, data are downloaded as well as uploaded, so

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that any changes entered in either system will be transferred to the other. The benefits of using a personal digital assistant for electronic sign-out are portability of information and ease of finding information (5). The device weighs only 6 ounces and is about the size of a deck of cards.

Data are entered either by writing with a stylus, using the proprietary Graffiti character system, or by tapping on a virtual keyboard. In addition, data can be entered via the Palm Desktop software, using the full functionality of the desktop computer. These methods work well, and since the development of the Palm portable keyboard, data entry is even easier.

The operating system is fast and efficient. The designers have focused primarily on speed and ease of use. Therefore, it is not bogged down with extra features and does not have a tendency to fail, requiring rebooting.

It became apparent that if other members of the team used personal digital assistants, less editing using Microsoft Word on the desktop computer would be necessary. In addition, the synchronization procedure saves time and provides a backup of the information. Also, when patients return to the hospital,the old summary can easily be found on the desktop computer and updated.

The Palm Pilot's built-in organizer features are one of its advantages in electronic sign-out. The to-do list provides a mechanism for keeping track of tasks that need to be done as well as those already finished. We use category tabs 1 through 5 to indicate priority as well as the status of the patient; for example, one tab indicates that the patient is stable and awaiting placement.

The attached-note feature of a to-do item is used to provide a clinical summary of the patient, which helps team members monitor patients' clinical progress. Other features of the Palm Pilot are also used. If detailed notes are too lengthy to fit in the attached-note feature, the memo feature provides more space. The address book feature lists the phone numbers of all hospital staff and of clinics for follow-up referral.

Although this process has not been rigorously studied, anecdotal evidence demonstrates how the use of personal digital assistants has facilitated continuity of care. When one of the physicians was on vacation, the substitute physician, who did not have a personal digital assistant, had no access to information. The clinical staff had to inform both the substitute physician and the oncoming physician of the clinical status of patients.

Discussion

Security is a key issue in the use of a personal digital assistant for electronic sign-out, because portability makes the information vulnerable to unauthorized access. This concern is partly addressed with the use of a password lock feature, which prevents unauthorized access if the device is lost. However, the owner of the device must always invoke the lock feature, which is inconvenient. A better mechanism is to automatically force the user to log on.

Another vulnerability is that the data are not encrypted. Software is available to encrypt blocks of information, but doing so is inconvenient and may be difficult for some users. Data in a desktop computer are also not encrypted, but data from the personal digital assistant are not readily viewable by the casual user. This potential security problem is of particular concern with mental health information; confidentiality is a critical element of mental health care.

The fragility of the device may also be a concern. However, if the synchronization feature is used regularly, the user is protected with a backup of the information. Some people may have difficulty learning to operate yet another electronic device, and some may object to having to do so. The original developers of the Palm Pilot, who are now at a rival company called Handspring, did their best to make the device fairly simple and intuitive to use with graphical icons. Most users learn the Graffiti letter interface fairly quickly or are content to tap out letters on a virtual keyboard.

Conclusions

Despite the potential security breaches that the portability of the personal digital assistant invites, portability is its strength. In our hospital the Palm Pilot has provided an organized and efficient method to transmit clinical information—a method independent of patients' charts, which are sometimes not available. The information transmitted by no means replaces the comprehensive information about each patient contained in the chart. However, it is clearly superior to scanning through a chart to become familiar with the salient clinical issues when time is of the essence.

The ease and organization of electronic sign-out using personal digital assistants has led to the development of a full-scale project in the department of psychiatry at the hospital. These devices will be purchased for all the resident physicians, who will use them for electronic sign-out in the consultation and liaison service and on all the teams at the hospital. Additional software will be purchased so that these devices can be used for documentation and printing via the infrared port. Limited decision support will be provided using medication handbook software and a list of *DSM-IV* criteria. Our experience with the Palm Pilot illustrates how the information needs of a mobile workforce in a health care setting may be met to ensure quality patient care.

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