SPECIAL SECTION

BUILDING A PATIENT RECORD SYSTEM

New Information Technologies Will Support Development Of Patient-Focused Care

BY AL HARRELL

Although the concept of a computerized patient record (CPR) is not new, few healthcare providers have implemented one, and no organization currently has the kind of CPR system experts envision for the future. Such a system, they project, will give users throughout a healthcare organization immediate access to diagnostic studies, treatment information, discharge summaries, operative reports, x-rays, and other patient information.

Experts also predict the CPR system of the future will take 10 to 15 years to materialize. In the meantime, health systems, physician practices, and managed care organizations can take a first step by building their components of a CPR system and ensuring they operate efficiently.

At Genesys Health System, Flint, MI, our vision is to build our continuum of care into a regional integrated healthcare delivery system. The system will have three components: a primary care physician network, a managed care organization, and a new hospital and healthcare delivery system based on patient-focused care (see Young S. Suh, "A System for the Future," *Health Progress*, December 1993, pp. 51-53, 60).

Any integrated delivery system now being developed will require a CPR as its information base. Genesys planners have set out to find a system that will accomplish its needs and be available and running when our new facility opens in 1997. We believe Genesys will be the first health system in the nation to build a new, patient-focused care hospital and related CPR from the ground up.

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Enabling Patient-focused Care

Before thinking about the technical aspects of a CPR, healthcare executives need to examine business and clinical issues and decide what they want

Summary As part of its plan to build a regional integrated healthcare delivery network, Genesys Health System, Flint, MI, has been developing a computerized patient record (CPR). The CPR will give users throughout the system immediate access to diagnostic studies, treatment information, discharge summaries, operative reports, x-rays, and other patient information.

Before considering technical aspects of the system, healthcare executives considering implementation of a CPR should examine business and clinical issues to determine what they want to accomplish with the CPR. The Genesys information system is being designed with the following goals in mind:

- Organizing based on patient needs
- Allocating resources at the point of care
- Working as a broadly skilled, empowered staff
- Delegating authority and accountability
- Using technology to enable patient-focused care within the context of the system vision

Genesys envisions a CPR system that brings together records from such sources as emergency rooms, outpatient clinics, community service organizations, physicians offices, care teams, managed care companies, and financial systems. Genesys's use of care plans for specified procedures and diagnoses will enable it to use exception-based documentation of care delivered, whereby only departures from the protocol or unexpected outcomes are recorded.

to accomplish with the CPR. This will determine which strategies are appropriate in working toward a CPR.

The information system of the future will not just automate the existing medical record or expand on claims processing or other administrative systems. Rather, it will generate records that chronicle a patient's care throughout the continuum of services. Such technology may create a virtually "paperless" system, increasing productivity, reducing administrative costs, reducing duplication, and providing a data base for outcomes measurement.

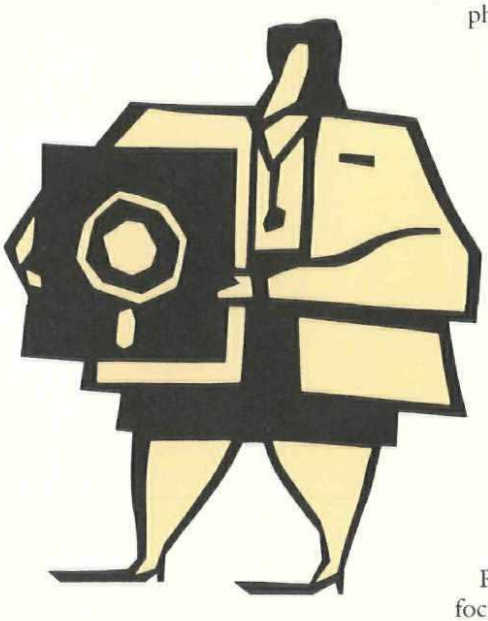
The Genesys information system is being designed with the following operational goals in mind:

- Organizing based on patient needs, wherever they are
- Allocating resources at the point of care
- Working as broadly skilled, empowered staff (care teams)
- Delegating authority and accountability
- Employing technology to enable patient-focused care within the context of the system's vision

The information system of the future will chronicle a patient's care throughout the continuum of services.

The Genesys Technology Vision

Under the CPR system Genesys envisions, a single electronic patient record will document all interactions with the health system, with the most current patient information available at the point of care, whether that is the acute care, ambulatory, home healthcare, or other setting. The CPR will include not only the nursing notes and output of various laboratory and diagnostic results, but also the radiologic images and perhaps even multimedia voice narratives.



This CPR will bring together records from the following sources:

- Emergency room and outpatient freestanding facilities
- Community-based services, including nursing homes, medical sports complex, social agencies, home healthcare
- Primary care and specialist physician offices
- Laboratory, pharmacy, operating room, and radiology
- Patient care management team (through protocols of care, point-of-care devices, multimedia high-resolution devices)
- Managed care company
- Financial systems and operational support

In effect, a seamless longitudinal patient record will be instantly accessible to care givers at any point in the continuum.

Healthcare systems will have records for patients who have never even been in their hospitals. Records would be entered for every contact with the health system (e.g., doctor office visit, medication prescriptions), as well as for visits to system-sponsored programs (e.g., nutritional seminars, smoking-cessation clinics). Ultimately, CPR will enable the system to provide better and more effective care because it will contain a longitudinal history of a range of some health habits, as well as actual healthcare services delivered.

Exception-based Documentation

Automated management of data will be essential to an effective electronic patient record. Genesys is currently developing protocols of care, or care plans, for many medical conditions.

For example, the system will establish a set of protocols that generate the care plan and physician orders for patients with appendicitis. Such care plans will not only streamline the care process, they will also simplify the collection of data. In fact, if the care plan is followed and outcomes meet expectations, documentation will be unnecessary. Documentation will be required only when changes are introduced into the plan or patients do not respond to treatments as expected. Such "exception-based" documentation will not only make data collection easier, it will more clearly identify procedures that need to be modified or replaced.

Defining Goals and Benefits

Reengineering the workplace for patient-focused care involves changing the way care givers process orders and test results and document care. Acceptance of the CPR and the operational changes that accompany it thus involves a change in mind-set. Without the cooperation of patients and care givers, no information system will be successful. It is therefore important that physicians help define and clearly understand the

goals of the system and buy into them.

The primary goal of patient-focused care is to enable care givers to spend more time with the patient, instead of shuffling paper or waiting for diagnostic results. The benefits of such an approach include improved clinical quality and physician, staff, and patient satisfaction. Patient-focused care also lowers costs and enhances the flexibility, responsiveness, and dependability of services.

Operational Efficiencies The day-to-day benefits of patient-focused care include:

- Less time on rounds
- Less paperwork
- Ability to anticipate physician needs
- Improved communication between care team members
- Improved coordination of patient transitions
- Improved organizational responsiveness to physician problems

Genesys conceives CPR as, in essence, a technological enabler for patient-focused care. The system's plan includes innovative technology such as portable terminals, hand-held laboratory instruments, and automated input of vital signs, as well as user-friendly, fast, and dependable software.

The ability to enter clinical and legal data on computer at the bedside will relieve nurses of their traditional time-consuming chore of logging such information at the end of the shift. Not only will the information be easier to enter; it will also be more accurate and more quickly available, resulting in improved productivity and patient care.

Improved Clinical Research The CPR will also yield more comprehensive clinical information for research and analysis to help better define the organization's practice patterns. Currently, a researcher or analyst can obtain that information in a number of ways (e.g., studying a representative number of charts, following up on study or analysis on a given condition or situation). But computerizing the function will allow them to obtain relevant information more quickly and easily.

Reduced Duplication Many physician offices have computer systems that store information only in the office setting. The longitudinal CPR eliminates most of the duplication of clinical information between the physician offices and the health system, thus eliminating redundancies in patient charts and diagnostic reports. With the CPR, such information can be kept on one system, where all those who need it have easy access.

TIPS FOR THOSE CONSIDERING A CPR

Health networks considering installing a CPR from the ground up, should keep several strategic considerations in mind:

- Information avenues are a key to the project's success. From the outset, develop a clear vision of how care is delivered. This provides a road map and drives the CPR system's design.
- Involve the highest levels of administration in the planning and implementation process.
- Involve care givers in the planning and development process. Ultimately, the system will succeed by meeting their expectations.
- Keep expectations realistic. Technology capabilities exist, but applications may be limited and will most likely require extensive, customized modifications.
- Do not make the CPR the goal; rather, it should be the result of appropriate use of technology that aids the care-delivery process.

Patient-focused care enables care givers to spend more time with the patient, instead of shuffling paper.

Improved Treatment Information An important benefit provided by the CPR and automation of the patient record is dramatic enhancement of the information available to help treat conditions and to get diagnostic work under way. The CPR will enable care givers across the continuum to provide the patient with the right treatment at the right time, at the right cost. From their offices, doctors can review standing orders and diagnostic results and issue new orders much more efficiently. Treatment can begin sooner, and patients can recover at a faster pace.

The efficiencies provided by the CPR and other technology can thus reduce the length of a patient's stay in the hospital, resulting in substantial savings in resource utilization for the health system. Most important, more timely and accurate information helps the health system to better achieve its goal of a healthier community.

Other Benefits The new technology will also allow the health system to transmit images electronically. Radiology results, for example, will be sent directly to a physician's office, saving the time and resources now used for duplication and transportation. Film storage libraries will be replaced by computer storage, freeing up institutional space and resources, as well as the tasks of indexing, stacking, retrieving, and delivering film images.

The marriage of the telephone, television, and computer will soon revolutionize day-to-day

Continued on page 54

VITAL LINKS FOR TODAY AND TOMORROW

Continued from page 47

diet), health risk status (e.g., blood pressure, chronic conditions, cholesterol), self-care knowledge and confidence, patterns of utilization of health services, use of preventive and early detection/intervention services (e.g., immunizations, mammography, prostate screenings, Pap smears), and utilization of services for preventable events (e.g., asthma and diabetes crises).

Lessons Learned

One of the key lessons the process taught was the importance of patience and of a clear understanding of what implementing a system entails. Planners should recognize that installing a new information system is a major commitment of time and energy. For the process to succeed, managers must closely watch every step and evaluate every piece of the system for its compatibility with other components and its effectiveness. Administrators should also avoid the temptation to customize the system in response to every request, which increases system costs enormously.

It is also important to ensure that reliable data are input into the system. This will often delay implementation—sometimes by many quarters—but it will be critical to the network's effectiveness.

Finally, managers and administrators can expect to encounter some initial resistance to the system. Educating users about the benefits of a comprehensive management information network is perhaps the most effective approach to overcoming such resistance. □

PATIENT RECORD SYSTEM

Continued from page 53

The success of a CPR system depends on its acceptance by the system's users—the care givers.

communications in medical practice. Within five years, voice/data/multimedia devices will enable two physicians in different locations to look at the same information simultaneously and discuss the patient's status.

Special Design Considerations

The plethora of computer-based applications and systems either available or being developed can make choosing system components a difficult challenge. Preliminary studies by a Genesys Health System consultant show that a typical medium-sized hospital can expect to spend between $15 million and $30 million to create and implement a CPR system like the one being developed at Genesys. Although this is a major investment, Genesys projects that overall cost savings will be achieved within five years after implementation.

Among care givers' most serious concerns about CPRs is that the computer will get in the way of "hands-on" care. Physicians have also expressed concern that patient information might be used in a manner not in physicians' or patients' best interests. The involvement of physicians, staff, and all departments in the design process is crucial to allaying such fears and promoting the CPR's acceptance and effectiveness.

Security and patient confidentiality in the CPR system are also important concerns in the healthcare community. Many researchers and vendors emphasize that, when used properly, the CPR offers more security than paper records and charts. Organizations can, for example, establish an audit trail that tracks everyone in the system who actually accesses the record. In addition, CPR system users can be required to use identification cards, keys, or passwords that are changed periodically. One scenario could involve requiring a password, plus another level of access (e.g., a two-tiered password or a password and a biometrics identifier such as fingerprints). However, too many security measures can be burdensome and actually hurt the speed and efficiency gained in the first place. Ease of access must be balanced with appropriateness.

Ensuring User Acceptance

Genesys put together a team of evaluators on the CPR project that included 25 to 30 clinicians from various parts of the system. The team members had numerous day-long sessions with vendors, where they reviewed and rated the potential of each CPR system based on established criteria.

Ultimately, the success of a CPR system depends on its acceptance by the system's users—the care givers. Four to five products could be equally effective for a health system. Every system has users who rave about it, and others who feel it does not meet their needs.

A good portion of every potential system considered by Genesys has been in use elsewhere. Some are very close to what we require, but none completely fits our new environment. Approximately 80 percent of what is needed for the health system of the future is available now. Designing and implementing the other 20 percent is the key to the success of any CPR system, requiring customization to the individual health network and continued technology improvements. □