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Charles H. Nash III, B. Douglas Wilson & Melissa D. Puckett

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# Implementation of an Electronic Clinical Management System: One Cancer Center's Experience

by Charles H. Nash III, M.D. F.A.C.P., B. Douglas Wilson, and Melissa D. Puckett, M.T., H. (A.S.C.P.)

**T**he Don & Sybil Harrington Cancer Center, a large freestanding cancer center in Amarillo, Tex., is implementing a clinical management system to integrate its clinical and administrative functions. This modular system includes software programs for scheduling, charge capture, billing, patient assessments, transcription, electronic patient records, and on-line radiation therapy treatments. Patient demographic information, medication history, vital signs, and laboratory results are also available on-line to help staff care for the patient population in a more efficient manner. Each outreach clinic has access to the system via modem or the Internet.

The system functions as an electronic means of collecting, processing, and interpreting data for existing patients and for the more than 1,500 new patients seen at the center each year. It also acts as a tool for planning and implementing process changes throughout the organization, especially those old processes that existed for no other reason than "they had always been done that way." The clinical management system has enabled staff to design more

*Charles H. Nash III, M.D., F.A.C.P., is president and medical director of the Harrington Cancer Center in Amarillo, Tex. Melissa Puckett, M.T., H. (A.S.C.P.), is director of quality services, and B. Douglas Wilson is manager of information services at the same institution.*

efficient processes throughout the center.

Early in the development process, Harrington established an Implementation Committee, a multidisciplinary group including department members from nursing, medical records, lab, radiation therapy, accounting, quality services, information systems, and members of the medical staff to oversee the overall process of system implementation. First, committee members had to examine the various center operations to see how new computer hardware and software would affect them. Any center-wide process change would require broad buy-in and interest from the staff.

Regular communication with other departments is crucial. Committee members met with staff to create flowcharts that documented the step-by-step procedures and processes within each department. Proposed changes were re-charted and reviewed by affected constituencies.

## **THE SEARCH FOR SOFTWARE**

The search for a new information system is a daunting task. Vendor information is helpful, but frequently it fails to disclose product limitations that are crucial to the functioning of a center. To begin the search, staff physicians and administrators were asked to list functions they would like to see performed by the new system. These functions then were collated and prioritized. Vendors whose products seemed to accommodate the needs of the center were invited to make on-site presentations to the committee and staff, a step that limited the vendor candidates

to three. After the on-site presentations were made, one product seemed to be the most applicable to our needs. We then hired a consultant to independently evaluate our center's software needs and to recommend a solution. When his product recommendation concurred with the committee's first choice, site visits were made to two different institutions where the product was in use. These visits were helpful to gain a firsthand view of the product, its strengths, and weaknesses.

Commitment by the vendor to support the center's implementation is a crucial determinant in the selection process. Overall, we have been pleased with the fulfillment of this commitment. Another key element to consider is the software's ability to write reports using data in the system. This capability allows members of the administrative team to use standard and customized reports to better analyze departmental functions. These reports can range from payer analysis to documentation of patient waiting times. We expect this capability to expand as the final components of the system are added.

## **SYSTEM IMPLEMENTATION**

Implementation of the Harrington Cancer Center's clinical management system began in January 1998. It has been a gradual process, with special attention focused on users who are unfamiliar with a computerized environment. The first phase involved construction of the network infrastructure that would electronically link Harrington sites. The purchase and installation of new

equipment, upgrading of some existing workstations, and work-space renovations came next. Training classes were organized to familiarize staff with new hardware and standard office software packages that included word processing and spreadsheet applications, e-mail, and the Internet.

Our aim was to help users become as familiar with a computer as possible, even before training on the new patient software itself. Not surprisingly, those who embraced computer training had a shorter learning curve than those who were less receptive. Those who remained uncomfortable with basic computer functions had much more difficulty with the new clinical management software and took much longer to train. We compensated by grouping staff with similar comfort levels together to minimize the frustrations from learning at too quick (or too slow) a pace.

The second phase was marked by configuration of the clinical management software. Configuration included setting up center location directories, staff and physician referral directories, procedure and supply lists, CPT codes for billing, and customizing the ICD-9 codes. Workstations were configured with the appropriate capabilities, and interfaces were established with radiation therapy equipment and the laboratory information system. The Technology Advisory Committee, a group responsible for overseeing new technologies at the center, drafted guidelines and procedures for use of the new HCC network. Training for use of the clinical management system was then initiated.

The third phase involved the laborious task of data conversion from the old system to the new system. Determination of the types of data to be converted is key, and planning the task is crucial before the "go live" date. To reduce the risk of lost data and to enable the clinical functions of the center to proceed smoothly during the transition, both systems were run in a parallel fashion for several days. The committee decided what information would be retained in both systems and when the older system would be shut down.

Scheduling and billing modules

were the first to be brought on-line, four months after the project began. During this initial period, processes were continually reviewed and evaluated by the staff and the Implementation Committee. Refinements were made as necessary and eventually implemented. A month later, automation of the radiation therapy equipment was accomplished. Implementation of other modules followed every two or three weeks thereafter.

A pivotal tool in a clinical management system is its ability to electronically map and deliver a course of treatment for an oncology patient. Under development, these "care maps" (or care plans) are designed to integrate predetermined diagnostic and treatment elements for patients. These elements could include lab tests, X-rays, chemotherapy regimens, and follow-up appointments. Eventually care plans will be used to standardize care, evaluate outcomes, and track cost by diagnosis.

#### **SLOW BUT STEADY TRANSFORMATION**

The gradual process of implementing new modules continues at the Harrington Cancer Center. The team currently is preparing for implementation of the electronic portal imaging workstation, enabling clinicians to review on-screen X-ray images, compare X-ray and simulation films, and interface with the center's CT unit and 3-D treatment planning system.

Process change often is accompanied by additional stress for the health care team. The eventual evolution towards a paperless environment will no doubt ease data management at the center. However, maintaining ties to the paper environment is necessary for a freestanding cancer center that today must interact with numerous hospitals and other external health care facilities that are themselves at various stages of technological development.

People are usually excited about the change that a new information system can bring...that is, until they begin to realize that a system change will necessitate a personal change in the way they perform

their daily functions. We found then that those who resist change really dig in. Highly structured processes that have been in place for years are usually the most difficult for people to forsake. For example, transitioning from a paper-based scheduling book to an electronic system was a traumatic event for some staff. In fact, the Harrington Cancer Center held a ceremonial (but non-flammable) "burning of the book" to mark the transition to the electronic scheduling system. The key is to keep users focused on how the computer system is going to benefit them in their jobs. Eventually staff will depend on the new electronic system in much the same way they did the old system.

The well-being of patients and the efficiency of staff performance depend on the system's ability to function optimally. Reliability and service are critical elements to consider when choosing a vendor. We recommend discussing a potential vendor's commitment to a reliable system at the outset. An institution should be assured that the system won't go down; but if it does, it goes down for minutes rather than days.

To protect itself against an unlikely system failure, the Harrington Cancer Center has implemented a paper back-up system to ensure that data are documented. Each day a set of reports necessary for daily and weekly operations is saved directly on the network. This backup information can be printed in the event of a sustained failure.

#### **CONCLUSIONS**

The implementation of a new electronic clinical management system is not easy, and certainly not instantaneous. Each institution will have to discover its own comfort level with technology and how best to invest in it. Planning a technology investment must be performed wisely with input from key leaders and staff. The focus should be on process improvement, and care should be taken to consider staff anxiety. However, the ultimate undertaking should improve quality of care and quality of life for both patients and staff alike. ■