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Prognosis good for KM in patient treatment

- **Judith Lamont** of Zentek

By Judith Lamont, KMWorld senior writer

A hospital operating room might seem like a perfect match for a computerized workflow system—one that tracks a patient moving through the complex stages of a surgical procedure, for example. Workflow software, an enabling technology of knowledge management, has much to offer the medical profession, codifying process knowledge and facilitating team interaction. Surprisingly, few such products are available to support the delivery of medical care. However, when key KM technologies such as workflow, decision support and data mining do enter the scene, the result produces improved care and greater cost-effectiveness in treatment.

The Hennepin County Medical Center (HCMC), a Level One Trauma Center in Minneapolis, Minn., has 18 operating rooms situated in two surgery units that are two blocks apart. The prospect of also integrating a newly built surgical center was raising concerns about coordinating staff and hospital functions in multiple locations. The remodeling steering committee began exploring options for improving the communication process, and discovered NaviCare. NaviCare offers a family of workflow solutions for operating rooms, inpatient nursing units, emergency departments, and other medical services.

“We had seen NaviCare’s product at a neighboring hospital,” says Alana Conlon, R.N. and clinical IT manager at HCMC, “and heard favorable reports from the doctors.” Installation was easy, reports Conlon, and was timed to coincide with the opening of the surgical center. “Now, everyone has the same information about patients at the same time,” she adds, “and because of the icon-driven presentation, our staff was able to use the system practically from the moment it was turned on.”

NaviCare’s products track and display a patient’s progress through surgery or other medical procedures. In the waiting room, families view a screen that indicates the patient’s status (with the patient’s name encoded for privacy). The medical staff views screens that show a list of patients and the surgery that is scheduled, along with an indication about whether steps in the critical path have been accomplished. In addition, NaviCare can flag certain precautions such as an allergy to latex. In other parts of the hospital, departments can view the NaviCare screens and know immediately where staff such as anesthesiologists are located.

Inspired by a combination of personal experience, market research, and collaboration with a highly computer-literate physician, Dave Richter, CEO of NaviCare , worked with physicians, nurses and hospital administration to develop a flexible tracking solution. The system has been well received by patients, families, and staff alike. “Our clients tell us that when patients are interviewed about their hospital experience,” says Richter, “they often bring up the NaviCare tracking system. They can observe caregivers documenting steps in the process, and it reduces anxiety, an important factor in clinical outcomes.” Family members report a reassuring feeling of being connected to their relative as they view

his or her progress through the procedure. Also, families need less feedback from staff, since they are well informed. Similarly, physicians and caregivers have a smoother experience, because everyone has the same view of the patient's status.

eRecords

Victory Springs Senior Health Associates developed an eRecords system for internal use that is now being made available to other providers. Based on Lotus' Domino server and using Internet Explorer as the interface, eRecords creates and maintains medical records, streamlines workflow and manages data.

"We chose Domino because it provided the security we needed and the ability to interface with other systems," says Mike Torppey, director of online operations at Victory Springs. For example, at the end of a patient visit, the doctor might place orders for lab tests, which are sent electronically to the lab. Once the results are entered into the system, the doctor reviews them and creates a visit document that includes lab results and the conversation with the patient.

Victory Springs has also partnered with ElderPort, which provides a portal in nursing homes and assisted living settings through which families can communicate with staff caregivers. Access to doctors will soon be included in the portal so that family members can receive information and ask questions about the patient. In addition, when eRecords is integrated into the portal, doctors will be able to automatically generate a letter at the end of the patient visit in which they provide information on issues such as medication changes and treatment suggestions. The system has great potential for improving the communication with families of those in nursing care, who may have trouble getting accurate information from elderly relatives.

Clinical aid

A new Web-based physician order entry (POE) system in the neonatal intensive care unit is helping to ensure that correct doses of medication are given to premature and critically ill infants at Brigham and Women's Hospital in Boston, a founding member of Partners HealthCare System.

"The guiding principle," says Steve Flammini, CTO and director of application development at Partners, "is that the system is a tool that makes it easy for clinicians to follow clinical policy guidelines." The POE is one of several core clinical applications supported by the Caché database from InterSystems. Partners' Web-based deployment followed a previous client/server version that had substantially reduced adverse drug reactions in patients.

Caché, a post-relational, object-oriented database, can handle the complex, hierarchical data sets that are typical of healthcare, and offers a powerful way through which various clinical platforms can interact.

"Our knowledgebase is very heterogeneous," says Flammini. "We have established a model of loose coupling that allows such sequences as an information exchange between two databases, followed by a query for a result in the clinical data repository, and a clinical decision support algorithm." The system can detect, for example, whether a particular medication could harm a patient in combination with other medication, or indicate that it may not be the most effective medicine given factors such as the patient's age or weight.

"The system does not replace a physician," says Paul Grabscheid, VP of strategic planning at InterSystems, "but it brings together complex data sets to improve medical quality from two perspectives—avoiding mistakes and optimizing treatment." Grabscheid notes that the system at Partners is always being enriched from a medical knowledge and rules standpoint. In addition, he says, much work is being done to standardize diagnoses, so that qualitative descriptions can be made more consistent.

Real-time analytics

Underlying the recommendations contained in treatment guidelines are extensive analyses of risk factors and clinical outcomes. Florida Hospital launched a pilot study using IBM's Intelligent Miner for Data to study the factors associated with readmission for patients with congestive heart failure. By applying the models developed in the analysis, the hospital was able to choose treatments that reduced the likelihood of readmission. The new system reduced costs substantially, resulting in a 100% ROI over the first year.

"We can now carry out real-time analytics," says Alex Veletsos, IT director at Florida Hospital. "As patients are admitted, we can use our analyses to help make treatment decisions." The system also includes clinical best practices for stroke and pneumonia. The hospital's chief medical officer developed a recommended path of care for each of those conditions after reviewing the analyses. The treatment model is dynamic, changing with new information such as the ideal timing of medication.

"We can also merge demographic data with our internal data," says Veletsos. "This allows us to find geographic areas that are associated with specific health problems."

"Florida Hospital is unusual in its real-time application of predictive modeling," says Karen Parrish, VP Worldwide Sales, Business Intelligence Solutions at IBM. "In addition, they are sharing their data with physicians and residents at the hospital, to teach new doctors about best practice protocols." Intelligent Miner has been used successfully in other hospitals and in retailing, logistics, publishing and other environments for sophisticated, cross-platform data mining.

Doctors vs. guidelines?

How receptive are doctors to treatment guidelines? According to a report from the Center for Studying Health System Change, more than half of today's physicians are influenced by treatment guidelines, and two-thirds of that group view the guidelines positively. Doctors who completed their training within the last five years were more likely to answer affirmatively on both factors (being influenced, and viewing guidelines positively). Among the possible explanations for the overall favorable attitude is that the guidelines provide an extra measure of quality control that helps protect against malpractice claims.

Automating physician order entry (POE) can provide another layer of protection. In a study conducted by Harvard University physicians, nearly three-fourths of errors in prescribing medication were deemed preventable. POE systems contain information about dosage and drug interactions, so that inappropriate prescriptions are questioned. The study stated that measures including computerized prescribing systems could eliminate the adverse reactions that resulted in the malpractice claims.

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