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Data Integration Needed for Hospital IT Payoff

By Robert L. Scheier, senior editor, Triangle Publishing Services Co. Inc., January 2007

For decades, hospitals, physician groups and other healthcare providers have automated many individual tasks in handling clinical information. The admissions clerk taps patients' health and insurance information into a computer rather than writing it on paper. Patients' MRIs and lab results probably exist only on a computer disk rather than on film and paper, and their nurses might record their vital signs on a portable computer rather than on a clipboard.

Each of these applications reduces the costs of buying, moving, storing and searching through paper forms. But the real financial benefits come when such standalone applications are linked to give healthcare providers a more complete picture of the care they're providing each patient. Connecting the applications helps to ensure providers get paid for each procedure they perform. It also allows providers to track the success of their treatments, which in turn helps improve patient care as well as the marketing of that care to potential patients.

Islands of Automation

Patient safety is, of course, the primary reason for moving to automated systems. A 1999 study by the National Academy of Sciences' Institute of Medicine estimated that as many as 98,000 people die in hospitals each year as a result of preventable medical errors. But those errors also have a financial impact, which the report estimated at between \$17 billion and \$29 billion a year. This includes not only lost income and household productivity of the victims but the cost to hospitals of providing extra care to compensate for the error.

So it's no surprise that automating the process of dispensing medication is one of the current growth areas, observers say. A 2004 ruling from the Food and Drug Administration requires barcode labels for drugs as well as blood and blood components. When combined with barcodes on patient ID bracelets, this would allow a central pharmacy application to automatically check to ensure that the proper drugs reach the proper patients.

In response to all these concerns, most hospitals have moved away from paper for at least some functions, but rarely all of them, says Andrew Kemmeling, vice president of consulting services at Phoenix Health Systems, a healthcare automation consulting and outsourcing firm in Richardson, Texas. "They might be automated in the general finance area and in the way they process bills," he says, "but the pharmacy might still be paper-based."

Many hospitals have "done the easy stuff," such as automating patient



admissions, "which is a pretty linear process," says Nancy Miracle, a registered nurse and manager at Phoenix Health Systems. "Now, we're starting to get into some very complex patient care processes." Even with the recent introduction of software that can handle the complex flow of work among different departments that care for a single patient, many hospitals still have 20 or more separate computer systems. That level of complexity makes it hard to get an overall view of patient care or quality trends, Kemmeling says.

ROI of Digital Health Information

Reduced paper-handling costs

Fewer non-reimbursed procedures

Increased ability to qualify for "pay-for-performance" reimbursement

Ability to capture quality-of-care data for marketing purposes

One big challenge in getting these systems to work together is bridging the various ways used by different vendors to format information within their applications and to make that information available to other applications. For example, Kemmeling says barcoding is being held back by issues such as competing standards for the creation and formatting of such codes. However, the emerging HL7 standard "has pretty much revolutionized" the ability of different medical applications to share clinical and administrative data, Kemmeling says.

Case Study: Integration at Work

High Point Regional Health System, a 384-bed hospital in High Point, N.C., is an example of the value of integrating medical systems. Ever since the early 1990s, it had been inputting data such as patient admission, discharge and accounting records into a computerized administrative system.

In 2002, it added software that allowed nurses, nurses' assistants and respiratory therapists to update each patient's care record on one of 100 wireless computers. Karen Harris, a registered nurse and director of clinical information services at High Point says the system paid for itself in the first two years through reduced spending on paper and forms. Among other savings, the medical records department reduced its staff from 32 to 21 people and freed up office space for use by another department. Since then, the hospital has extended the system for use by physical and occupational therapists, social workers and pastoral care workers.

Beyond reducing spending on paper forms, capturing clinical information online has made it easier and less expensive to share, distribute, analyze and act on that information. Rather than paying an experienced nurse to sit and extract information from a pile of paper records to review the success of a certain medication or treatment regimen, or the performance of a specific nurse or therapist, a hospital administrator can now pull up and analyze that information instantly, Harris says.

The documentation system also has helped High Point improve its "charge capture"—its ability to properly charge insurers for every medication and treatment it performs, complete with the proper "code" that indicates the procedure and the amount the provider will be paid. Today, many hospitals or

other providers employ coders to go through patient records to ensure that every procedure has been properly submitted, says Phoenix Health Systems' Miracle. "The typical physician is not educated on coding," she says, and may fail to note specific conditions or services that must be coded for the hospital to be reimbursed.

It's much more likely the hospital will get paid quickly, and at a lower administrative cost, if the charge capture is automated. At High Point, "We have tied the charge capture behind the documentation so the nurse doesn't have to think about it," Harris says. "They just document" the procedure, and the documentation application automatically sends the charge to the accounting system for billing to the insurer.

Growth Areas for IT in Healthcare

Automated pharmacy services to reduce medication errors

Barcoding of everything from patient records to lab samples and medication to ensure proper identification of patients and patient-related information

Use of mobile computers and tablets to record clinical information

Analysis of patient care information to determine which services to provide in the future

Linking systems also makes it easier and less expensive to store patient records for long periods, as required by HIPAA (the Health Insurance Portability and Accountability Act of 1996) and to make that data available to physicians. "When a patient is discharged, all of that clinical documentation can be electronically shifted into our medical records system for long-term storage," Harris says. Using a Web-based portal, physicians can review patient records, approve treatment notes or even a patient's discharge "while they're sitting home watching the football game," she says.

Implementation Advice

One of the big challenges facing any organization is whether to buy and connect "best of breed" applications for each department or function or to buy a suite of applications from one vendor for all its needs. Although each application in the suite might not be the best on the market, the fact that one vendor provides all the software helps assure the various applications will work together.

Harris took the second approach and is glad she did. She recommends "partnering with a big vendor" that can provide new modules as a hospital needs them. This approach means that the new components can be easily integrated into other applications from the same vendor. Such integration work, she says, would be too expensive for a relatively small institution such as High Point to do on its own.

She also, she laughs, took "the very painful approach" of moving directly from paper-based reports to a purely online system. "Some places capture data electronically but still print out paper reports for physicians to review," Harris adds. "We didn't do that."

However, it wasn't easy. "It was a huge challenge" to convince doctors to totally

give up paper reports. If the hospital ever agreed to resume printing paper reports, though, "it would be hard to break" doctors of the habit, Harris says.

Educating doctors, nurses and other end users of the value of automated systems is crucial, says Phoenix Health Systems' Miracle. The IT department, she says, "cannot be the only champion in the room."

The Future

The next step for High Point is to automate the hospital's medication administration system. The new system, due to be in use by the fall of 2007, will provide a set of checks and balances to ensure the right medication is administered, in the right dose, to the right patient. Aside from improving patient safety, the hospital will save "the cost of additional care, complications, allergic reactions and drug interactions," Harris says, for which the hospital may not be reimbursed if those complications require care beyond what an insurer will pay for a patient's original diagnosis or procedure.

Beyond the near-term cost savings, integrated clinical and administrative systems give healthcare providers the data they need to advertise the quality of their services and to quickly make corrections when their standard of care has fallen. Through the electronic capture of clinical data, Harris says, High Point can quickly scan the results of specific procedures to find where, for example, some of its more than 500 nurses might need extra training.

Hospital executives, insurers, regulators and the public are increasingly likely to examine and demand such data. Insurers are beginning to consider whether a facility has technology such as barcode scanners when setting malpractice insurance rates for hospitals, says Phoenix Health Systems' Kemmeling. The growing move toward "pay for performance," which rewards higher quality healthcare providers, will require hospitals to provide data to prove their performance, says Laura Wooster, director of technology leadership at the National Alliance for Health Technology.

Examining large numbers of individual patient records also can show whether there is a rising need for, say, chronic care rather than acute illness services, helping hospitals decide which services or facilities to expand or curtail, Miracle says.

Done correctly, linking the islands of automation that already exist at healthcare providers is good not only for the patient but for the bottom-line, as well.

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