Thank You!

Hospitals & Health Networks extends special thanks to Accenture, McKesson, and the College of Healthcare Information Management Executives (CHIME) for their support of the 2006 Most Wired Survey and Benchmarking Study.
Measuring VALUE

2006 Most Wired Winners

The nation's 100 Most Wired Hospitals and Health Systems are pairing information technology with strategic plans in their efforts to improve quality, streamline processes and drive financial returns. The dominant role of financial assessments in evaluating IT plans has been replaced by a "balanced scorecard" approach, elevating non-financial measures—both quantitative and qualitative—as equal partners in the classic return-on-investment calculation.

The underpinning of this new and evolving discipline is measurement. The nation's Most Wired are leading the way in applying business analytics to their IT projects. The goal is to deliver value through improvements in quality, satisfaction and patient care. Compared with other organizations, the Most Wired:

- Conduct more pre- and post-implementation evaluations of IT projects.
- Maintain a larger proportion of their medical records in a paperless format.
- Provide digital imaging to more clinical disciplines in a wider range of settings.
- Employ a broader set of telemedicine services.
- Deploy more IT educational resources for staff.

In addition, the 100 Most Wired are more likely to develop business continuity plans and to test them. They also have systems in place to more rapidly reconstitute clinical information systems in the event that a disaster causes the complete loss of the primary data center. (See sidebar, "Double-Edged Disaster").

Each year since 1999, Hospitals & Health Networks has surveyed the nation's hospitals on their use of information technology to accomplish key strategic and operational goals, including safety and quality objectives. Based on a detailed scoring process, H&HN annually names the 100 Most Wired Hospitals and

Articles by
Alden Solovy

Most Wired research and tabulation:
by Suzanne Hoppeschulitz, Jennifer Towne and Alden Solovy

Photograph by Chuck Lasky
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Healthcare Systems. The 2006 Hospitals & Health Networks' Most Wired Survey and Benchmarking Study is a joint project of HfN, Accenture, McKesson Corp. and the College of Healthcare Information Management Executives. For the past six years, Hospitals & Health Networks has engaged outside analysts to determine if there's an association between information technology and clinical goals for that technology, such as improvements in safety and quality. Solon conducted the 2006 mortality analysis using risk-adjusted mortality rates. (See sidebar, "A Measure of Quality"). This year, we also took a closer look at how federal hospitals fare on the survey. (See sidebar, "Bringing Up the Curve," page 16).

The top tech hospitals continue to lead the nation in how technology is deployed and employed to improve care, including: using a wider array of IT tools to address quality and safety, physicians entering significantly larger percentages of orders themselves, and the organization conducting a larger percentage of clinical transactions via information technology.

The differences in the prevalence and use of IT among the Most Wired are consistent across all five sections of the eight-page survey. This year, 541 surveys were submitted by hospitals and health systems representing 1,217 hospitals. (See "About the Survey" in the foldout section.)

**VALUE STATEMENTS**

The 100 Most Wired are more than twice as likely as the Least Wired, defined as the 100 organizations scoring lowest on the survey, to develop specific plans for when IT project results will be measured and when the original business case objectives will be evaluated for their top five strategic projects. (See figure 1.)

Park Nicollet Health Services, St. Louis Park, Minn., measures the value of IT projects using a total-cost-of-ownership model, defined as a five-year, cost-benefit analysis including costs of labor, software, hardware, maintenance and support. Costs are compared with projected clinical and financial benefits. Hospital executives are now combining this evaluation model with its lean production quality initiative.

Increasingly, Park Nicollet pays attention to cycle time and time reduction, says Francis Cheung, vice president and chief information officer. "We believe IT projects can have a positive impact on cycle time reduction. In a workflow that they can accept and use," she says that information technology allows physicians, nurses, pharmacists and other caregivers to see information tailored to their needs.

The 100 Most Wired Hospitals and Health Systems conduct a broad scope of analyses to determine the value of their top five strategic IT projects, such as developing plans for when projects will be measured and when the original objectives will be evaluated; defining and setting targets for financial, quality, safety or patient satisfaction metrics; and establishing a baseline for each measure. The typical Most Wired organization conducts these activities for an average of 75 percent of its top projects.

"There is still some disparity as far as how value is achieved and measured," says Lewis Reid, managing partner, Accenture Health Practice Provider, Atlanta. Some hospitals emphasize financial returns, while others look for quality and process improvements. "The priorities of hospitals vary. It's another Most Wired first-timer, also evaluates the impact of information technology on clinical and operational processes.

"We look at every IT project as a process improvement project that utilizes information technology as an enabler," says Jim Albin, the organization's vice president and chief information officer. "The value of the project is the resulting improvement in the clinical or operational process. The improvements can be in the form of fewer tasks in the process, better information at decision points, fewer handoffs, quicker cycle times or better availability of information. They all translate into higher quality and more efficient patient care." Information is a key value. "One of the main IT value producers is comrnunications," says Billie Walds, R.N., vice president, McKesson Provider Technologies, Alpharetta, Ga. "When you think about the information that's needed to ensure patient safety, you need to deliver it to the right people at the right time for project metrics with stakeholders. Specific plan for when project metrics and original business case objectives will be measured and evaluated. Prevent project risk analysis. Prevent project cost benefit analysis. Source: 2006 Hospitals & Health Networks' Most Wired Survey and Benchmarking Study.

**A Measure of Quality**

Improving outcomes is a key source of IT value. try to prove it measuring the impact of specific information technologies on individual processes or quality indicators can be difficult enough. Measuring the systemic impact of broad IT investments on quality generally is a monumental task.

For the third consecutive year, Hospitals & Health Networks worked with outside analysts to determine if the 100 Most Wired have demonstrated different mortality rates than other hospitals. Solon LLC, Evanston, Ill., a performance measurement company conducted both the 2005 and the 2006 analyses.

The 2005 results were statistically strongest, showing that the mortality of the 100 Most Wired was on average, risk-adjusted mortality rates that are 7.2 percent lower than other hospitals. The conclusion, valid at the 95 percent confidence level, controlled for the size of hospital and teaching status.

The 2006 results showed that the 100 Most Wired have, on average, 1.6 percent lower risk-adjusted mortality rates valid at the 95 percent confidence level. The Most Wired list consists of both hospitals and systems. In 2006, the total number of hospitals represented in the sample fell, making it statistically more difficult to achieve a higher confidence interval. Results in 2004 were valid at the 95 percent confidence level, but the absolute difference was less than 1 percent. CareScience conducted the 2004 analysis.

"I don't think these differences in statistical outcomes change the overall conclusion. The likelihood that you can explain these results as a random occurrence is still pretty small," says Karve Safavi, M.D., Solon's chief medical officer.

The problem is that you can't sort out cause and effect with any confidence. The analysis shows an association between outcomes and IT, but doesn't establish that the outcomes were caused by the technology. The question is whether technology resulted in the improved outcomes or if implementing technology is a practice that's found alongside other activities that drive quality.

"You can't achieve the kinds of improvements in quality that the industry is striving for without greater investments in information technology," says Lewis Reid, managing partner, Accenture Health Practice Provider, Atlanta. Those investments will drive both quality and operational improvements, he says.

"It would be a mistake, just because you can't prove causality, to dismiss the role of IT in improving quality. That would be dismissing everything we know about the use of technology to hard wire process improvements," Safavi says.

"First you need a plausible explanation. Then you have to ask, 'What is the likelihood that these two things occur randomly?'." The answer depends on both infrastructure and adoption, says Steve Mayfield, the American Hospital Association's senior vice president of quality and performance improvement. Disparate systems must connect, he says, or the power of IT to standards, processes and provide clinical intelligence is thwarted. "IT must connect across the value stream. Otherwise, you get a pot of information," says Mayfield, director of the AHA Quality Center. "Until the infrastructure is in place, it's hard to determine that the technology makes much of a difference."

Yet, by itself, all the infrastructure that money can buy won't drive quality. "If physicians aren't using it, we're back to a limiting factor that constrains value," Mayfield says.

Billie Walds, R.N., vice president, McKesson Provider Technologies, Alpharetta, Ga., says that physician adoption is one aspect of the broader challenge of clinician adoption. "The physicians are important, but don't forget about the nurses, the pharmacists and the other clinical staff," Walds says. "The nurses and ancillary staff are doing most of the clinical work. They're with the patients. You're not going to drive value in any way without clinician adoption."

The goal is to standardize processes and deliver information to caregivers. With both infrastructure and adoption, it is vital to improving processes and driving quality, Mayfield says. Accenture's Reid agrees. "As hospitals get more-focused on measuring quality and outcomes, we will find it that requires a great deal more clinical information technology." Safavi suggests that demonstrating systemic improvements in quality driven by IT may be moot. "To try to disengage it would be to suggest that you don't need clinical IT to improve results. That flies in the face of everything we know about the role of technology in improving quality."
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Increasingly, Park Nicollet pays attention to cycle time and lead time reduction, says Francis Cheung, vice president and chief information officer. "We believe IT projects can have a positive impact on cycle time reduction." Cheung says, "We are beginning to incorporate time measures into our total-cost-of-ownership model. A number of our recent projects focus on cycle time reduction for inpatient stays and urgent care visits to increase operating capacity." Park Nicollet appears for the first time on the Most Wired list and is also one of this year's Most Wireless.

Mercy Health Partners, Toledo, Ohio, another Most Wired first-timer, also evaluates the impact of information technology on clinical and operational processes. "We look at every IT project as a process improvement project that utilizes information technology as an enabler," says Jim Altin, the organization's vice president and chief information officer. "The value of the project is the resulting improvement in the clinical or operational process. The improvements can be in the form of fewer tasks in the process, better information at decision points, fewer handoffs, quicker cycle times or better availability of information. They all translate into higher quality and more efficient patient care.

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Specific plan for when project metrics and original business case objectives will be measured and evaluated

Preproject risk analysis

Preproject cost benefit analysis

Baseline measurement established for each metric

65%
62%
62%
56%
56%
65%
77
41
39
88
84
73
70
73
74
78
70
55
67
57
62
72
32
61
73
38
48

Source: 2006 Hospital & Health Networks' Most Wired Survey and Benchmarking Study

A Measure of Quality

Measuring outcomes is a key source of IT value; try to prove it

IT would be a mistake, just because you can't prove causation, to dismiss all the work that's been done in improving quality. That would be dismissive everything we know about the use of technology to hard wire process improvements," Safavi says. "If you need a plausible explanation. Then you have to ask, 'What is the likelihood that these two things occur randomly?'

The answer depends on both infrastructure and adoption, says Steve Mayfield, the American Hospital Association's senior vice president of quality and performance improvement. "Disparate systems must connect, be shared, or the power of IT to standardize processes and provide clinical intelligence is thwarted. "IT must connect across the value stream. Otherwise, all you get are pockets of information," says Mayfield, director of the AHA Quality Center. "Until the infrastructure is in place, it's hard to determine that the technology makes much of a difference.

Yet, by itself, all the infrastructure that money can buy won't drive real quality. "If physicians aren't using it, we're back to a limiting factor that constrains value," Mayfield says.

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The goal is to standardize processes and deliver information to caregivers. With both infrastructure and adoption, IT is vital to improving processes and driving quality, Mayfield says. Accenture's Reid agrees. "As hospitals get more focused on measuring quality and outcomes, they will find that it requires a great deal more clinical information technology."

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The difference is one of emphasis. Redd says, citing as an example two academically
medical centers, each implementing the same system. "One is focused on making
sure their financial returns exceed the out-
lay, even though they want the quality improvements," he says. "The other one is
much more focused on making process changes and quality improvements, but
they'll certainly take any financial returns that come along the way."

The two often go hand-in-hand. "You can get the quality and service benefits along
with the efficiency and financial returns," Redd says. "They are not mutually exclusive."

Concord (N.H.) Hospital conducts project reviews six to 24 months after
implementation. "We measure financial improvement, user satisfaction and qual-
ity improvements," says Dona Morrison, chief information officer. The hospital
makes its third appearance on the Most Wired—Small and Rural list and appeared
twice on previous Most Wired lists. "For every IT project we undertake, we establish
written business objectives with associated performance metrics," Morrison says.

The Most Wired often tie their IT investments to specific strategies.

"Our IT projects are evaluated on a multifaceted pro-forma that takes into account quality, operational efficiencies, community support and financial goals," says Nicholas Christiano, vice president and chief information officer, Health Quest, Poughkeepsie, N.Y., a 2006 Most Wired Innovator Award winner. "Through a portfolio
management process, we strive to make a 'balanced investment' that provides
enough financial benefit to support those projects that may not have a high ROI, but
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IT AND OUTCOMES

Improving quality is a prime motivator for IT investments, and the Most Wired orga-
nizations take extra care to evaluate the effects of technology projects on outcomes.
"IT investments allow us to provide more comprehensive patient data at the right
time and in the right format, allowing our providers to make better decisions on the
treatment of our patients," says Ellen Prevelich, chief information officer, Greene Memorial
Hospital, Xenia, Ohio, which is one of the six Most Wired in 2006. "It frees up our nursing
staff so they can be better focus on patient care and at the same time provides for good documenta-
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The Most Wired are applying analytical
tools to determine the risks and benefits of various clinical technologies, particularly those that infl uence process and workflow.

"We quantify the alignment with our overall strategic plan, the impact on patients,
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Halakama, M.D., CEO, Beth Israel Deaconess Medical Center, Boston, making its first
appearance as a stand-alone hospital. CareGroup, its parent company, was on the Most Wired list in four previous years. Beth Israel Deaconess is also a Most Wired hospital.

"We evaluate impact on workflow, errors and throughput. Our CPOE system has reduced medical errors by 50 percent," Halakama says. "Our emergency department dashboard has reduced length of stay in the ED by 45 minutes." The organization's e-prescribing system is currently being evaluated.

The use of a broad set of value and qual-
ity measures is typical among the Most Wired. "We measure the success of our IT projects in many ways. One way is through the improvement in the quality of care. Another way is through reduction in paper," says Marty Fattig, CEO, Nemaha County Hospital, Auburn, Neb. The hospital is one of this year's Most Improved organizations.

CUTTING THROUGH PAPER

The 100 Most Wired Hospitals and Health Systems are significantly further along in creating paperless records.

"Our information technology system has allowed us to store more and more information electronically, eliminating the need to store paper records," Fattig says. "Our business office has actually removed most of the file cabinets from their department because they no longer need them."

The survey asked hospitals to detail the composition of their medical record by esti-
mating the percentage of their records in each of several categories that are available
digitally via direct feeds from computer-
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The difference is one of emphasis, Redd says, citing as an example two academic medical centers, each implementing the same system. “One is focused on making sure their financial returns exceed the outlay, even though they want the quality improvements,” he says. “The other one is much more focused on making process changes and quality improvements, but they’ll certainly take any financial returns that come along the way.”

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IT AND OUTCOMES

Improving quality is a prime motivator for IT investments, and the Most Wired organizations take extra care to evaluate the effects of technology projects on outcomes. “IT investments allow us to provide more comprehensive patient data at the right time and in the right format, allowing our providers to make better decisions on the treatment of our patients,” says Ellen Predoehl, chief information officer, Greene Memorial Hospital, Xenia, Ohio, which is one of the 2006 Most Improved. “It frees up our nursing staff so they can better focus on patient care and at the same time provides for good documentation of the patients’ visit.”

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The Most Wired Team

HIMSS appreciates the efforts and support of many individuals who contributed to the success of the Most Wired Survey and Benchmarking Study, the Innovation Awards, and the publication of these results. The surveys and analyses that go into this rating process are necessarily involved in providing insight and direction. Employers of the American Hospital Association provided background research, and HIMSSMost Wired Magazine Editorial Advisory Board reviewed the survey and served as judges for the Innovation Awards. Materials management leaders served as judges for the Supply Chain Innovation Awards. The following is a partial list of the many individuals who contributed to the 2006 Most Wired Survey and Benchmarking Study.

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Supply Chain Innovation Award Judges

Deven Bross, director of material resource management, Holy Rosary Medical Center, Ontario, Ohio; Theresa Camp, supply analyst, UTRW, Galveston, Texas; Frances Doyle, division chairman, membership management, Mayo Clinic Rochester, director of supply chain services, Swedish Medical Center, Englewood, Colo.; Jay Krykh, supply chain officer, HCA Healthcare, Nashville, Tenn.; Deven Bross, director of procurement, Methodist Health, Dallas, Md.; Neal Sauer, director of capital projects, Methodist Health, Dallas, Md.;in*members of the 2006 HIMSS Most Wired Magazine Editorial Advisory Board

Double-Edged Disaster

Hospitals prepared for a digital blackout?

It may be the digital equivalent of the double-edged sword. In a disaster the reliance on paper medical records can leave patients and caregivers without critical information: medications, allergies, patient histories and chronic conditions. That's just for starters. Yet, the state of digital disaster preparedness among the nation's hospitals appears shaky at best. Electronic records, like their paper counterparts, are protected if they are to be available in a major crisis.

The risks of paper are plain. "We learned an awful lot from Katrina and how much trouble you can be in if that's the only way you can get information," says Bill Bailey, R.N., vice president, McKesson Provider Technologies, Alpharetta, Ga. Records were washed away by the torrent.

But, without the right precautions, the digital record can be just as vulnerable—and just as untenable—as the paper record. Data from the 2006 Most Wired Survey suggest that hospitals have significant work remaining to protect electronic medical records. Nearly 40 percent of respondents estimated that it would take at least three days to restore clinical information systems operations in the event that a disaster caused complete loss of the primary center. That number jumps to 56 percent of the least wired. (See figure 9.)

Hospitals also appear to need to work on developing business continuity plans. More than 35 percent of all respondents reported that they didn't have business continuity plans or do not test those plans. That number jumps to 60 percent of the Least Wired. (See figure 9.)

The rash of hurricanes hitting the Gulf states, especially Katrina and Rita, as well as California's earthquakes safety requirements, are "pushing the industry to develop stronger business continuity plans," says Lewis Redd, managing partner, Accenture Health Provider Practice, Atlanta.

Redd suggests that reliance on clinical information technology increases, business continuity planning will gaingreater emphasis among hospital leaders. "The more you invest in information technology, the more you care about disaster recovery," he says. "You'd expect a strong correlation between investment in IT and developing a business continuity plan."
of quality and managerial analytics. "We are able to more accurately document improvements with the clinical systems we have in place versus the prior paper work," says Randy Haskins, information systems director, Mercy Medical Center–North Iowa, Mason City, which is one of the 2006 Most Wired–Small and Rural. "We are tracking many patient quality factors and would be unable to easily do so without the EHR."

Haskins says a significant area of improvement comes from using rules-based systems to improve the medication management process. The hospital has documented improved quality measures—such as severity-adjusted mortality and severity-adjusted length of stay—while improving nursing documentation, timeliness of treatments, timeliness of test results available to clinicians and reductions in variable drug costs.

The drive to go paperless goes hand-in-hand with the drive to go landfill-less. The survey asks hospitals to identify if they provide digital images for six clinical areas. All but one of the Most Wired provide digital radiology images in the hospital inpatient setting, compared with 72 percent of the Least Wired. The differences became even more dramatic for other clinical areas. For example, 92 percent of the Most Wired provide digital cardiology images in the hospital setting, compared with 40 percent of the Least Wired. (See figure 3.)

Combining data and images improves clinical decision-making, says McKesson's Walds, pointing to cardiology as a prime example. "In a paper world, you've got the image and the paper chart . . . somewhere. Then you hope there's a medication administration record," she says. "When you're able to incorporate the image along with the relevant patient data, you can make a decision very quickly. The critical goal is to combine all the relevant information with the image."

"The Most Wired are also further along in providing digital images in other settings, such as clinics and physician offices. "Our system is designed so that providers, with proper security clearance, can view images on their patients via the Internet," says Fatma."
of quality and managerial analytics. “We are able to more accurately document improvements with the clinical systems we have in place versus the prior paper workflow,” says Randy Hawksen, information systems director, Mercy Medical Center—North Iowa, Mason City, which is one of the 2006 Most Wired—Small and Rural. “We are tracking many patient quality factors and would be unable to easily do so without the EHR.”

Hawksen says a significant area of improvement comes from using rules-based systems to improve the medication management process. The hospital has documented improved quality measures—such as severity-adjusted mortality and severity-adjusted length of stay—while improving nursing documentation, timeliness of treatments, timeliness of test results available to clinicians and reductions in variable drug costs.

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The digital reach of the Most Wired extends from medical records and digital imaging into telemedicine. Telemedicine links to other hospitals are the most common, with physicians offices not far behind. Depending on the setting, the Most Wired have four to 10 times more likely to provide clinicians consultations via telemedicine than are the Least Wired.

The Most Wired also provide a broad array of IT educational resources to staff, including physicians and nurses dedicated to training colleagues on IT. Roughly one in eight of the Least Wired report that they do not provide any IT educational resources to staff.

MEDICATION SAFETY

The Most Wired Survey takes a detailed look at both ends of the medication administration process: order entry and medication administration. Respondents are asked to estimate the percentage of medications ordered electronically and who enters them. They are also asked to estimate the number of doses electronically matched to the patient.

Bedside medication matching is a priority among the Most Wired, and they continue to lead other hospitals in the use of electronic medication administration. The Most Wired estimate that more than 90 percent of medications are matched to the patient and the order at the time of administration using bar coding or some other form of auto-ID. The list of these organizations also match the drug to the nurse. (See figure 4.)

The percentage of medications matched at the bedside is even larger among two groups: the 25 federal hospitals responding to the survey and the top 50 scorers in the survey’s quality and safety section, identified as IT Quality Leaders. That group includes 25 Most Wired hospitals and 15 hospitals that scored among the top 50 on the quality and safety section, but whose total score did not qualify their organizations for the 2006 Most Wired list.

The Most Wired also excel at using IT at the start of the medication administration process, with an average of 36 percent of medication orders entered electronically by physicians. That’s more than twice the average for all respondents and 18 times greater than the Least Wired, where 2 percent of medication orders are entered by the medical staff. (See figure 5.) As with bedside medication matching, federal hospitals and the IT Quality Leaders lead the way in provider order entry.

“The greatest opportunity for increase in quality will come with the increase in the percentage of physicians using these systems,” says Ron Mangol, chief information officer, University of New Mexico Hospitals, Albuquerque. The organization is making its fourth appearance on the Most Wired list.

CLINICAL ADOPTION

Community hospitals with volunteer medical staffs have argued that hospitals with captive medical staffs—those with a large percentage of employees who are physicians—will resist IT. That’s not true when looking at the rankings at the top 100 Most Wired, although the effort isn’t quite as dramatic. The results suggest that most of the gain occurs when between 40 percent and 50 percent of physicians are on staff. Incremental gains in reported results are relatively small in organizations with more than 50 percent of physicians.
2006 Most Wired Survey

Bringing Up the Curve
Federal hospitals show higher safety and quality scores

Federal hospitals, primarily military and VA institutions, excel in the use of information technology for medication safety and other quality improvements.

Of the 25 federal hospitals that completed the 2006 Most Wired Survey and Benchmarking Study, eight were recognized among the 100 Most Wired and two among the Most Wired—Small and Rural. Yet, the group of 25 federal hospitals that completed the survey—including the 17 that did not make the Most Wired—scored significantly higher in the safety and quality section of the survey than did the 100 Most Wired as a whole.

The Most Wired report that 36 percent of their medication orders are entered electronically by physicians, compared with 78 percent of the federal hospitals that responded to the survey. The results are similar at the other end of the medication ordering and distribution process. On average, the Most Wired electronically match 31 percent of doses administered to the patient and order at the bedside, compared with 60 percent of all federal hospital respondents.

"Wireless access within the hospital allows point-of-care access to physicians for review records, enter orders and update information at the patient's bedcide," says Pamela Pickett, RN, J.N., nursing programs/informatics coordinator at VA Medical Center, White River Junction, Vt. The organization, which appears on the 2006 list of Most Wired—Small and Rural, has a bar-code medication system that matches each dose to the nurse, the patient and the order at the time of administration.

Pickett says that the electronic patient record allows information to be entered and reviewed from any location within the medical center, at VA community-based clinics and from selected locations at an academic affiliate. "Clinical information can be easily extracted and reviewed for compliance to established practice guidelines, performance measures and accreditation standards," she says.

VA Palo Alto (Calif.) Health Care System also uses a bar-code medication system.

"The most significant quality improvements brought about by IT investments are in the realm of patient safety," says Peg Graham, chief information officer of the health system, which makes its fourth appearance on the 100 Most Wired list.

"Fingertip access to comprehensive electronic medical records and decision support provide physicians with a more complete picture upon which to base their diagnoses and treatment plans. Bar-code medication administration dramatically decreases medication errors. Allergy, drug, food and vitamin interaction databases also provide vital information for both the physician and patient to achieve maximum drug efficacy."

Federal hospitals surpass the Most Wired in physician use of alerts and reminders. For example, 24 of the 25 federal hospitals (96 percent) in the sample say that at least 81 percent of their physicians use allergy alerts. 24 federal hospitals are at that same threshold of physician adoption of drug-drug interaction alerts and 23 federal hospitals (92 percent) report that level of physician adoption of duplicate order alerts. This compares with 59 percent of the Most Wired reporting that at least 81 percent of their physicians use allergy alerts, 48 percent say they are at the same level for drug-drug interaction alerts and 52 percent report that level of physician use of duplicate order alerts. Federal hospitals also report generally higher use of alerts and reminders by nurses and pharmacists.

"It's not the mere presence of IT that accounts for our amazing success. It's also the way in which it was deployed, the way in which it is used and the way in which it is developed," says Steven Kastin, M.D., director of clinical informatics, Veterans Integrated Service Network 3, Bronx, N.Y. This is the fifth time VISN3 has appeared on the 100 Most Wired list. "Key to the VHA success is the significant involvement by clinical and other staff in the development and refinement of IT products," Kastin says. "This allows our IT products to finely match the needs of users."

Federal hospitals tend to lag behind in other areas of the survey. Those federal hospitals that ranked lower on the list had less automation in business processes, customer service and public health and safety. On the whole, VA and military hospitals have quality and safety as the top priority, followed by workflow and business processes.

MEASUREMENT MANAGEMENT
Delivering value through information technology requires measurement and management.

"We look to measure improvements in process and quality that are made possible by our IT systems. The systems themselves rarely have a return on investment. It's how you use them," says George Bendle, chief information officer, University of Pennsylvania Health System, Philadelphia, which is making its sixth appearance on the Most Wired list. "We constantly look for ways to leverage our existing IT systems to improve value."

The process of measuring results has been formalized among many of the nation's Most Wired. Senior executives at Hahm Medical Center, Erie, Pa., conduct a monthly review of clinical performance measures that includes the chief quality officer and other top executives.

"We are able to measure, prioritize and make changes that directly impact our patients and the care they receive," says Joe Bulley, vice president and chief information officer. "Specific IT investments that are routinely providing meaningful, actionable input include bedside medication administration, automated incident reporting systems and data mining and surveillance systems for infection control."

The medical center is making its fourth appearance on the Most Wired list.

"Process teams accept responsibility for analyzing data and trends, redesigning work and maintaining the focus on our patients," Butler says, adding that "specific clinical performance measures are included in our strategic plan."

When it comes to delivering value through information technology, the nation's 100 Most Wired hospitals and health systems continue to focus on performance metrics and patient outcomes.

"Value and quality go hand-in-hand," says Robert Theiss, ChiO, Bloomberg (Pa.) Hospital, one of the 2006 Most Improved.

"In health care, our product is positive outcomes. It has a positive impact on quality; there is value. The greater the influence, the greater the value."

CONTINUED COVERAGE
Information technology can bring value to every aspect of a hospital's operations. For additional Most Wired Survey results and analysis, don't miss these articles:

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- "Supply Chain Innovation Award winners, Materials Management in Health Care, July 2006"
- "2006 Innovator Award winners, HIMSS Most Wired Magazine, August 2006"
- "Automation in the supply chain, Materials Management in Health Care, August 2006"
- "Telemedicine, Most Wired 2006"
- "Forbes, August 2006"
- "Board issues, Trustee, September 2006"

GIVE US YOUR COMMENTS: Hospitals & Health Networks welcomes your comments on this article. Simply go to www.hhnmag.com. Click on the computer mouse next to the appropriate headline, "2006 Most Wired Survey," you can e-mail your comments to webedit@hhnmag.com, fax them to (612) 422-4000, or mail them to Editor, Hospitals & Health Networks, Health Forum One, Northfield, Chicago, Ill. 60060.
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Federal hospitals show higher safety and quality scores

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• 2006 Innovator Award winners, HIMSS Most Wired Magazine, August 2006
• Automation in the supply chain, Materials Management in Health Care, August 2006
• Telemedicine, Most Wired Outlook, Aug. 23, 2006
• Board issues, Trustee, September 2006
Thank You!

Hospitals & Health Networks extends special thanks to Accenture, McKesson, and the College of Healthcare Information Management Executives (CHIME) for their support of the 2006 Most Wired Survey and Benchmarking Study.
### The 100 Most Wired Hospitals and Health Systems

<table>
<thead>
<tr>
<th>Rank</th>
<th>Hospital Name</th>
<th>State</th>
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<tr>
<td>1</td>
<td>Mayo Clinic</td>
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<td>Cleveland Clinic</td>
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<td>4</td>
<td>University of Alabama at Birmingham</td>
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<td><a href="http://www.uabhealth.org">www.uabhealth.org</a></td>
</tr>
<tr>
<td>5</td>
<td>Massachusetts General Hospital</td>
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<td><a href="http://www.massgeneral.org">www.massgeneral.org</a></td>
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<tr>
<td>6</td>
<td>Johns Hopkins Hospital</td>
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<td>hopkinsmedicine.org</td>
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<td>7</td>
<td>University of California, San Francisco</td>
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<tr>
<td>10</td>
<td>University of Texas System Health Science Center at Houston</td>
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<td><a href="http://www.utmb.edu">www.utmb.edu</a></td>
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</tbody>
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### The Most Wired State and Rural

- **Most Wired State:** California
- **Most Wired Rural (2006):** Iowa

### The Most Wired Healthcare Organizations

- **2006**

1. **Mayo Clinic**
2. **Emory University Hospital**
3. **Cleveland Clinic**
4. **University of Alabama at Birmingham**
5. **Massachusetts General Hospital**
6. **Johns Hopkins Hospital**
7. **University of California, San Francisco**
8. **New York Presbyterian Hospital**
9. **University of Michigan Health System**
10. **University of Texas System Health Science Center at Houston**

### The Top 100 Most Wired Hospitals and Health Systems in 2006

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</tr>
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</table>

### The Most Wired State

- **California**

### The Most Wired Rural (2006)

- **Iowa**

### The 100 Most Wired Hospitals and Health Systems

- **Total Number of Hospitals:** 100

### The Most Wired Healthcare Organizations

- **Total Number of Healthcare Organizations:** 200

### The Most Wired State

- **California**

**Note:** This table represents the top 100 hospitals and health systems according to their Internet presence and usage for the year 2006. The data is compiled based on the availability of information at the time of publication. For the most current information, please refer to the relevant sources or websites.
The Most Widely Used

HPIH appreciates the efforts and support of many individuals who contributed to the success of the Most Widely Used Survey and Benchmarking Study, the Innovator Awards, and the research and analysis that goes into this results article. Leaders throughout health care are assessed in providing insight and direction. Employees of the American Hospital Association provided background research and perspective. Members of HPIH’s Most Widely Used Magazine Editorial Advisory Board reviewed the survey and served as judges for the Innovator Awards. Materials management leaders served as judges for the Most Widely Used Awards. The following is a partial list of the many individuals who contributed to the 2006 Most Widely Used Survey and Benchmarking Study.


Ametron Staff: Nadia Lefler, Lydon Newman, James Rabin, Patricia Redd

McKesson Corp. Staff: Michael L. Koppot, James Larkin, Mark Spencer, Leslie White

2006 Most Widely Used Survey Reviewers

Nico Mie, vice president of finance, Winona (Minn.) Health; Gerard Bars, M.D., director, medical informatics, Hospitals of Hamilton (N.Y.) University Medical Center; Ray Car, senior vice president and COO, St. Luke’s Episcopal Health System; Hoyt Boyer, M.D., director, Agency for Healthcare Research and Quality, Rockville, Md.; Cari Collet, former senior vice president and COO, Lifepoint, Providence, R.I.; Alana Cunningham, COO, Children’s Hospital, Omaha, Neb.; Grant Farrow, BIS communications director, Baylor Health Care System; Ken Ford, senior vice president, patient resources, and CMO, Connecticut’s Sacred Heart Health System; William Lam, COO, St. Joseph’s Health Network, Singapore; Susan Munn, senior editor, data and research, Health Forum, Chicago; Steve Radek, director of clinical informatics, VA New York-New Jersey Health Care Network (WSNJ); Roy Ritten, practical systems director, Alice Hyde Medical Center, Malone, N.Y.; Ron LeGrand, director, University of Missouri Medical Center, Kansas City, Mo.; Donald MacKenzie, vice president and COO, Orlando Health, Orlando, Fla.; Bob Price, COO, Mount Sinai, New York City; John Razi, director, Cerner Health System, Independence, Mo.; John Revell, vice president, firm operations, and COO, Samsung Health System, Singapore; Robert Schwimmer, senior vice president and COO, Sharp HealthCare, San Diego; John Stowers, director, systems, information systems, and COO, Dean’s Children’s Hospital, Boston; Nadya Sylvia, CIO, Children’s Hospital Healthcare System, Boston; Michelle Tallo, COO, University of Virginia Health System; Nancy Walter, vice president, VA National Appeals Center; Christine Zaman, COO, Cleveland Clinic, Cleveland, Ohio; Peter Zidek, COO, University Hospitals of Cleveland, Cleveland, Ohio; Tom Zuluaga, vice president and COO, St. Luke’s Health System, Kansas City, Mo.

Innovator Awards

Cenron-Keystone Health System

Springfield, Pa., www.ceke.org

Challenged to replace a legacy system and add additional functionality, Cenron-Keystone Health System developed an in-house application that combined bed tracking and administration, and patient transport systems at three hospitals. The application allows users to check and report job status using voice recognition. Environmental services and transport employees receive page notifications regarding their job assignments. Managers get an electronic alert when employees haven’t responded to a page with a defined time period. The bed tracking module gives an overview of each room with indicators such as sex of patient, drainage status of room and transport status of patient. Users can drill down to a more detailed description of each room.

Supply Chain Innovator Award Winners

2006 Medical Support Squadrons

United States Air Force Academy, Colorado Springs, Colo., www.cafasyolm.org

The 10th Medical Support Squadron centralized requisition, receiving, stocking, management and distribution of all pharmaceuticals used to support three military treatment facilities. Two dispensing robots fill all prescriptions, while logisticians use PCs to scan bar codes to take inventory. Inventory is updated in real time in the materials management information system, enabling electronic ordering of supplies for next-day delivery. The delivered items are then scanned, generating a receiving report and charging end users. Once the supply system prescription wait times have decreased by 40 percent.

BB, Sisters of Mercy Health System

Chesterfield, Mo., www.mercy.net

Mercy’s Resource Optimization and Innovation (ROI) division developed a pharmaceutical repackaging and distribution infrastructure. Integrated medication cabinets record transaction data and build replenishment orders. When shipments arrive, unit dose bar-coded medications are produced for hospital use, then electronically merged with manually repackaged medications and staged in sealed file boxes with cabinet location labels. Since implementation, clinical activities on the nursing floors have doubled.