Are Patients Happier at Most Wired Hospitals?

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It is the fifth consecutive year that an analysis shows that the Most Wired have better outcomes on a variety of quality measures. It is the first year in which Hf/HN closely examined the potential link between use of information technology and patient satisfaction. Hf/HN worked with Press Ganey Associates Inc. for the satisfaction analysis and with Thomson Reuters for the quality analysis.

"Facilities that are more progressive with regard to IT are also those that are more progressive with regard to changes that improve the processes of care," says Dennis Kadenburg, Press Ganey's senior vice president of research, knowledge management and strategic planning.

"Health IT has shown incredible promise in helping us improve the quality and safety of the care hospitals deliver every day," adds Rich Umbrosh, president and CEO of the American Hospital Association. "The results of the Most Wired Survey confirm that today's patient also understands the benefits of IT in improving care and improving the overall hospital experience."

A growing body of evidence suggests that information technology is a key component of successful quality, safety and satisfaction initiatives. While these analyses show an association between IT and results, they do not show that adoption or use of IT caused those results.

"We may be measuring a commitment to quality," says Press Ganey's Suzanne Coshow, a research associate.

Lydon Neumann, senior executive at Accenture LLC, agrees that investment in information technology needs to be coupled with other efforts to drive exceptional results. "Most Wired is not the only thing at which these organizations excel. It is characteristic of those hospitals with advanced information technology. An analysis of data from the 2008 Most Wired Survey and Benchmarking Study finds that patients at top technology hospitals have a better overall assessment of their stay and specifically are more satisfied with the admission process and the manner in which tests and treatments are handled."

To a separate analysis, the nation's 100 Most Wired Hospitals and Health Systems have better outcomes on a variety of quality measures, including risk-adjusted mortality rates.

Taken together, the patient satisfaction and quality indicator analyses provide the strongest evidence in the 10-year history of the Most Wired Survey and Benchmarking Study that information technology makes a difference in both the patient experience and the quality of care. Yet, an irony emerges from the data. While analyses show that top tech hospitals excel in providing quality, patient-centric care, industrywide progress in adopting clinical IT remains elusive. Overall gains in the use of information technology appear remarkably slow.
of leadership that looks at all the elements they need in order to be high-performing organizations," he says.

Neumann adds that the investment in information technology demonstrates the organizational commitment to patients, caregivers, physicians and clinicians, and staff administration. "It indicates a will to invest in areas that advance organizational effectiveness," he says.

Hospital executives concur.

"The evolving relationship between quality and outcomes has always been at the heart of decisions regarding investment in technology solutions. Our focus is to continue supporting a quality patient care experience that delivers desired outcomes," says Bonnie Sessa, interim CEO of Continuum Health Partners Inc., New York, a 2008 Most Wired and Most Wireless organization. This is Continuum's first appearance on the "Most Wired" list.

"The role of IT in delivering exceptional outcomes through quality patient encounters is no longer a question. It's becoming essential to a hospital's care operation's ability to thrive," Sessa says.

\section*{IT and Patient Satisfaction}

Press Ganey evaluated patient satisfaction results from its client database: 248 Press Ganey hospital data sets responded to the 2008 Most Wired Survey. Patients at Most Wired organizations are more satisfied than patients at other hospitals.

In the Press Ganey methodology, satisfaction is measured in a variety of categories, each with multiple questions. This top-line result, which is a composite of all the questions on the satisfaction survey, is statistically significant at the 95 percent confidence interval (see figure 1).

As the consumer starts to shop more and more based on quality scores and pricing, how the consumer sees you in the marketplace will have an impact on what patients get, who pays, how you maintain, base or grow, and overall performance," says Roger Neil, executive vice president and CEO of Duncan (Okla) Regional Hospital, a 2008 Most Wired—Small and Rural class organization. "In order to be implementing systems and changes to systems to help us report consumer-based information externally."

Most Wired hospitals achieved higher patient satisfaction ratings, to different degrees of statistical significance, in eight of 10 categories. "Any action that an organization takes to improve communication, such as IT, is going to have an effect on patient perspectives," says Press Ganey's Kaldenberg.

The Most Wired have employed techniques ranging from patient portals to personal health records to foster strong customer relationships. "Patients perceive this as technology protecting them," says Merrie Wallace, R.N., vice president and solution line manager, McKesson Corp. "They feel the presence of that technology and they feel the safety."

Press Ganey researchers found two aspects of the analysis particularly noteworthy. First, satisfaction with the discharge process did not produce a statistically significant association with information technology. Researchers expected patient satisfaction with three areas—admission, discharge and the handling of tests and treatments—to be strongly associated with information technology, in part because hospitals have been active in using it to address these areas.

Second, researchers found a higher-than-expected association between IT and the overall patient rating of the hospital. In particular, the patient's likelihood to recommend a hospital is significantly higher among the Most Wired than other organizations.

"I would speculate that the visible presence of technology in an organization improves its image as a progressive or cutting-edge delivery system," Kaldenberg says. "Patients are most likely to recommend places with excellent service, display up-to-date technologies and provide their needed clinical outcomes."

Hospitals goal is to produce the best clinical and research best and the best patient experience possible, says Kevin Barbivae, CIO of Criosta Medical Center, LaPlata, Md., a 2008 Most Improved organization. "We will continue to add components to our infrastructure whose function may solely be to provide context-appropriate information to our patients," he says. "We will add others to streamline our patient's interactions with us, and still others that allow us to maintain long-term relationships with our patients."

As part of the study, Press Ganey conducted separate analyses to control for other factors that might influence the results, such as bed size and status as a critical access hospital or members of the Council of Teaching Hospitals or a Magnet hospital as designated by the American Nurses Credentialing Center. Although specific results for a few patient satisfaction variables changed, the overall conclusion—that hospitals with greater prominence in information technology have higher patient satisfaction—remained intact.

"In organizations that are more wired, patients perceive that clinicians are working together better," Press Ganey's Cowher says, adding that patients may associate the presence of information technology—such as workstations on wheels—with high-quality care.

\section*{IT and Quality}

Based on five years of analysis, the presence of information technology in a hospital is, indeed, associated with better outcomes.

Thomson Reuter's analysis of the effect of IT on outcomes among the 2008 Most Wired includes four measures of quality and two measures of cost. The quality variables are risk-adjusted mortality rates; risk-adjusted complication rates; and two composite indexes, one created from the Agency for Healthcare Research and Quality's patient satisfaction measures and one created from a subset of the Joint Commission's Core Measures based on data reported on the Hospital Compare Web site. The cost variables are: severity-adjusted average length of stay and case-mix wage-adjusted expenses per adjusted discharge.

"Quality and satisfaction are tied to overall initiatives that hospitals take generally and embrace with technology," says McKesson's Wallace. "Those that are successful use this as part of an overall strategy and they achieve significant results. Those who just deploy technology for technology's sake don't see these types of results."

The Thomson Reuters analysis was conducted twice, once comparing Most Wired hospitals with all other hospitals nationally—known as an out-of-sample analysis—and once comparing Most Wired hospitals to all survey respondents, known as an in-sample analysis (see figure 2). The results were consistent between the in- and out-of-sample analyses.

For the out-of-sample analysis, the 100 Most Wired had better results than all other hospitals nationally for four of the six measures risk-adjusted mortality rates, core measures, patient safety and average length of stay. This is statistically significant at the 95 percent confidence interval.

For the in-sample analysis, the 2008 Most Wired had better results than all the hospitals in the survey for the same four measures, with the difference for patient safety and average length of stay statistically significant at the 95 percent confidence interval and the difference for risk-adjusted mortality rates and core measures statistically significant at the 95 percent confidence interval.

"By following the questions in two ways and getting the same results, it adds more evidence to support the hypothesis that these hospitals are different in terms of safety and quality," says David Foster, chief scientist at Thomson Reuters' Center for Healthcare Improvement. Thomson has conducted the outcomes analysis for AHA/HIM for the past five years.

The evidence of systemic gains in quality and satisfaction from investment in information technology among the Most Wired is strong. These top tech hospitals are employing IT in the pursuit of quality, yet, the evidence of a slow slog toward widespread technology adoption and use among hospitals, in general, is equally as compelling.

\section*{Medication Management Challenge}

Take medication safety, for example. Of the 556 hospitals and health systems that completed the survey, less than 5 percent, a total of 213 organizations, have effectively deployed technology at both ends of the medication administration process. The remaining 95 percent represent an adoption gap that provides patients and reduces efficiency (see figure 3).
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"We will continue to add components to our infrastructure whose function may solely be to provide context-appropriate information to our patients," he says. "We will add others to streamline our patient's interactions with us, and still others that allow us to maintain longitudinal relationships with our patients."

As part of the study, Press Ganey conducted separate analyses to control for other factors that might influence the results, such as bed size and status as a critical access hospital or members of the Council of Teaching Hospitals or a Magnet hospital as designated by the American Nurses Credentialing Center. Although specific results for a few patient satisfaction variables changed, the overall conclusion—that hospitals with greater investments in information technology have higher patient satisfaction—remained intact.

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Medication Management Challenge

Take medication safety, for example. Of the 556 hospitals and health systems that completed the survey, less than 5 percent, a total of 23 organizations, have effectively deployed technology at both ends of the medication administration process. The remaining 95 percent represent an adoption gap that propels patients and reduces efficiency (see figure 3).
### Figure 4: Medications Ordered Electronically, 2004 vs. 2008

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Most Wired</th>
<th>Least Wired</th>
<th>All</th>
<th>Most Wired</th>
<th>Least Wired</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2004</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>2008</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians</td>
<td>12%</td>
<td>27%</td>
<td>3%</td>
<td>19%</td>
<td>46%</td>
<td>4%</td>
</tr>
<tr>
<td>Pharmacists</td>
<td>8%</td>
<td>12%</td>
<td>8%</td>
<td>9%</td>
<td>9%</td>
<td>12%</td>
</tr>
<tr>
<td>Nonclinicians</td>
<td>6%</td>
<td>50%</td>
<td>64%</td>
<td>43%</td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td>Not entered electronically</td>
<td>8%</td>
<td>3%</td>
<td>20%</td>
<td>4%</td>
<td>1%</td>
<td>17%</td>
</tr>
<tr>
<td>Total medication orders</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>


This conclusion stems from two core questions on the safety and quality sections of the survey. One question tracks the beginning of the process, examining how medications are ordered. The other question looks at the end of the process, determining if and how medication orders are matched to the drug and the patient. Survey respondents were asked to estimate the percentage of medications electronically ordered by physicians, nurses, pharmacists and non-physician in 1998. Using that definition, 68 hospitals and health systems achieve full adoption of electronic bedside medication matching.

### Figure 5: Medication Orders Matched Electronically, 2005 vs. 2008

<table>
<thead>
<tr>
<th></th>
<th>All</th>
<th>Most Wired</th>
<th>Least Wired</th>
<th>All</th>
<th>Most Wired</th>
<th>Least Wired</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2005</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>2008</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bar coding or RFID of drug to patient and order at bedside</td>
<td>3%</td>
<td>5%</td>
<td>1%</td>
<td>8%</td>
<td>9%</td>
<td>3%</td>
</tr>
<tr>
<td>Bar coding or RFID of drug, patient, and nurse at bedside</td>
<td>11%</td>
<td>18%</td>
<td>0%</td>
<td>22%</td>
<td>29%</td>
<td>3%</td>
</tr>
<tr>
<td>Patient and user ID entered into automated dispensing device at bedside</td>
<td>1%</td>
<td>20%</td>
<td>2%</td>
<td>5%</td>
<td>2%</td>
<td></td>
</tr>
<tr>
<td>Patient and user ID entered into automated dispensing device away from bedside</td>
<td>43%</td>
<td>56%</td>
<td>31%</td>
<td>35%</td>
<td>39%</td>
<td>25%</td>
</tr>
<tr>
<td>User ID entered into automated dispensing device away from bedside</td>
<td>2%</td>
<td>10%</td>
<td>9%</td>
<td>18%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication not electronically matched</td>
<td>42%</td>
<td>19%</td>
<td>68%</td>
<td>23%</td>
<td>9%</td>
<td>49%</td>
</tr>
<tr>
<td>Total medication orders</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

This question was not asked in 2009. Sources: Hospitals & Health Networks' Most Wired Survey and Benchmarking Study, 2008.
Wow! Ten Years on the Most Wired List

When the Most Wired Survey debuted in 1999, 277 health care organizations generally responded to eight pages of questions regarding how they used technology to serve patients, clinicians, staff members, suppliers and insurers. Ten years later, 116 organizations submitted survey. Only the following six institutions have appeared on the Most Wired list every year since the survey’s inception, demonstrating a commitment to the potential of health information technology and the value of an annual assessment. Look for additional coverage of the 10-year winners in Most Wired Q4 2018.

Avera Health, Sioux Falls, S.D.
At Avera, process improvement provides entry application implementation. That discipline means the 27-hospital system minimizes the distance among its far-flung providers through advanced telecommunications capabilities and an ambulatory electronic health record with e-prescribing capabilities. Comprehensive automation in the supply chain combined with computerized provider order entry, an array of quality alerts and bar-code and radio-frequency identification tracking advance Avera patients’ safety.

Hackensack (N.J.) University Medical Center
Several automated business processes are saving time and money at Hackensack. Pharmacological and supply orders require no human intervention, while T-powered payer transactions and revenue-cycle activities increase spending power. Patient safety is also a priority, underscored by numerous access points for CPOE, diagnostic images and several EHR functions.

Men’s Health System, Fargo, N.D.
Men’sCenter’s 10-year winner status demonstrates the value of a well-rounded approach to IT. The organization has brought automation to nearly every aspect of its operations, including the supply chain, the revenue cycle and public health surveillance. Clinicians benefit from a highly accessible electronic health record, CPOE and a picture archiving and communication system.

Partners HealthCare, Boston
Partners resides in mediation safety, with physicians using e-prescribing for 99 percent of instantaneous medication orders, a sophisticated array of drug alerts for nurses, pharmacists and physicians, and a comprehensive electronic medication reconciliation process. In addition, the organization has implemented CPOE at 10 of its 11 hospitals. Physicians select from predefined standing order sets and receive alerts synchronized to their workflow.

Sharp HealthCare, San Diego
At the center of Sharp’s health information technology success is a robust EHR. Accessible from the hospital’s physician offices and other remote locations, it accepts direct feeds from biomedical equipment and supports electronic medication reconciliation. Sharp also provides an ambulatory EHR for its physicians, 90 percent of whom are independent.

University of Pittsburgh Medical Center
UPMC serves its clinicians with a host of technologies that bring patient information to the point of care and beyond. Physicians have wireless access to medical images, an EHR and CPOE, and they can perform research and complete a number of tasks using a sophisticated portal. UPMC is also known for developing its own cutting-edge technologies and spinning them off into for-profit companies.
IT Network Expands What's Possible for Each Member

Shared resources. Local control. To solve the issue of access to resources for information technology, a group of 30 hospitals and health facilities ranging from a 23-bed critical access hospital to a 623-bed hospital have come together to use the information systems of Inland Northwest Health Services, Spokane, Wash., a shared-services organization.

The NHS health information technology network includes more than 4,000 physicians, 450 nurses and physicians' aides and 1.1 million electronic medical records. More than 1,000 physicians access patient records weekly in NHS hospitals. Organizations that participate in NHS information technology services have access to a set of shared IT resources—including software and staffing—but make independent decisions about how to use those resources and how much to invest in IT projects. This year, 17 hospitals that use NHS services qualified for the 100 Most Wired list. Two are shown separately in the 100 Most Wired list because of their exceptional use of IT, such as the Medical Center of Aurora in Aurora, Neb., and Saint Heart Medical Center, Spokane, Wash. The other 15 were grouped into two regions for purposes of the 2008 Most Wired recognition. These hospitals are:

**Inland Northwest Health Services | Washington and Idaho Region**
- St. Luke's Rehabilitation Institute, Spokane, Wash.
- Holy Family Hospital, Spokane, Wash.
- Good Shepherd Medical Center, Spokane, Wash.
- Valley Hospital and Medical Center, Spokane Valley, Wash.
- Othello (Wash.) Community Hospital
- Pullman (Wash.) Regional Hospital
- Kennewick (Wash.) Community Hospital
- Mount Carmel Hospital, Coeur d'Alene, Idaho
- St. Joseph's Hospital, Chelan, Wash.
- Freeman (Wash.) Regional Hospital
- St. Luke's Magic Valley Regional Medical Center, Twin Falls, Idaho

**Inland Northwest Health Services | California Region**
- Providence St. Joseph's Medical Center, Bakersfield, Calif.
- Providence Holy Cross Medical Center, Mission Hills
- Little Company of Mary Hospital-Torrence
- Little Company of Mary Hospital-San Pedro

One NHS hospital was also recognized on the 2008 Most Wired-Small and Rural award list: Mason General Hospital, Shelton, Wash.

Wiring for Consumers: So Far, So Slow

Progress on hospital-based personal health records and patient portals has been virtually stagnant for the last three years. There has been limited growth in the number of hospitals providing PHRs and in the breadth of services offered, even among the nation's top technology hospitals, according to data from the Most Wired Survey and Benchmarking Study. Yet, those organizations that do provide PHRs and portals are rolling out new consumer-oriented services.

COOs from the nation's Most Wired Hospitals and Health Systems call these initiatives critical to providing patient-centered services. "The evolution of consumerism and transparency only accelerates our responsibility to provide accurate, reliable information on clinical outcomes, cost of services and the patient and physician experience. These requirements can only be supported by effective systems that capture this information and effective strategies that communicate this information," says Chris Oenendonk, vice president and COO of McAlester (Okla.) Regional Health Center, a 2008 Most Improved organization. "We must have significantly more advanced reporting capabilities and effective Web strategies to deliver this information to potential consumers."

Indeed, an analysis of the 100 Most Wired shows that patients at top tech hospitals, in general, have higher satisfaction ratings than other hospitals (See Cover Story, page 36). "Consumerism and transparency empower patients to take control of their health care decisions. This forces health care institutions to match that increased demand for information at a patient's fingertips around the clock," says Ronnie Sessa, interim CEO of Continuum Health Partners Inc., New York City's 2008 Most Wired and Most Wired organization.

Sessa adds that investment in information technology "must always be toward providing a full delivery solution, across technology that is accessible outside the health care institution." Progress on hospital-based PHRs, however, has been slow. In 2008, 34 percent of all hospitals responding to the Most Wired Survey said that they provide consumers with the ability to create a PHR via their Web site, up 4 percentage points from 2005. Slightly more than 44 percent of those are pilot programs (see figure 4).

The nation's top tech hospitals are more than twice as likely to provide a PHR, with about 37 percent of the initiatives in the pilot stage. But even among the 100 Most Wired, advancements have been limited: 79 percent of all hospitals responding to the Most Wired Survey said that they provide consumers with the ability to create a PHR via their Web site, just 5 percentage points higher than in 2005. At the same time, the hospitals that offer PHRs are providing a broader array of online services for consumers, including e-mailing physicians, renewing prescriptions and reviewing medical records.
The Information Technology + Data + Quality Equation

W hat the computer knows may save a life, or perhaps thousands of lives. One by one, alerts driven by information technology have the power to bring clinical interventions to individual patients more rapidly than simple human observation. Taken in total, the data collected by IT systems can help drive changes in clinical practice and processes that could improve the care for hundreds, perhaps thousands of patients.

The combination is powerful using IT tools and understanding the resulting data. Together, these two techniques are the hallmarks of how the nation’s Most Wired hospitals and health systems have applied information technology to improve quality. For the past five years, studies of the 100 Most Wired hospitals and health systems show that, in general, organizations with advanced information technology have better outcomes.

"As an organization, we are keeping a laser-sharp focus on initiatives that tie back to improvements in quality and patient safety," says Yousef Ahmad, senior vice president and COO of Mercy Health Partners, who is the West Region’s hospital with the highest score in the survey. "It is our goal to use the technology to proactively track and monitor our compliance with the core measures and other performance improvement initiatives that can improve patient outcomes," says Karen Graham, vice president and COO of Cooper University Hospital in Camden, N.J., recognized in 2008 as a Most Improved and a Most Wired organization. "Evidence-based tools will enable us to deliver a high quality standard of care and assist us in identifying in real time where standards of care are not being met."
beginning to report their clinical outcomes to consumers on their own Web sites. The Most
Wind are 12 times more likely to provide this service than the least wired (see figure 8).
• KIOSKS: Access to kiosks is beginning to grow. The predominant use is for wayfinding,
but hospitals also provide other services on these devices, including a variety of financial services
(see figure 9).
• TELEMONITORING: Home telemonitoring
efforts have also seen some limited gains among hospitals generally, as well as the 100 Most Wired.
For the most part, these efforts hover between one-
third to one-half of the Most Wired and 10 percent or less for the typical hospital (see figure 10).
• PORTALS: Patient portals are being used by
nearly 80 percent of the Most Wired and 37
percent of all hospitals. Like PHRs, growth in
overall use of portals has been stagnant since 2006,
but among those hospitals that do offer patient
portals, the number of services offered continues
to grow (see figure 11).
"Patient portal implementations and Web-based applications will be key drivers supporting the con-
sumer movement," says Richard Malk, CIO of
HealthAlliance Hospitals in Leonards, Mass., a 2008 Most
Improved and Most Wired organiza-
tions. "The various forms of con-
sumerism will continue to evolve, as
will the applications and
resources needed to support them."

For example, Duke University Health Sys-
tem, Durham, N.C., has launched the Healthview
Portal, which allows patients electronic access to
their own financial and medical information. It
also allows patients to view and request appoint-
ments with their physicians.
"Our goal is to increase online patient accounts
from 20,000 to 200,000, which will like-
ly increase [hospital IT] spending," says Shan-
on Jones, implementation manager, at Duke,
2008 Most Wired organization. This is Duke's
fourth appearance on the list.
"St. Luke's Health System, Kansas City, Mo., has St. Luke's Care Link, which allows
patients to interact online with their physicians
and keep a PHR."
"As this technology is incorporated into the
patient's and the physician's way of life, greater
efficiencies will be noticed by both par-
ties," says Deborah Gash, vice president and
CIO at St. Luke's, a 2008 Most Wired organi-
ization making its eighth appearance on the list.
"We expect that more physicians will request to
implement this into their practices, and that our
investment will continue to grow."

37
30
20
15
10
5
0
All
Most Wired
Least Wired
2008
2008
2006
2006
2008
2008
2006
2006
2008
2008
2006

20%
30%
10%
0%
%
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The Most Wired Team

H&F recognizes the efforts and support of many individuals who contribute to the success of The Most Wired Survey and Benchmarking Study, the information and insights that give rise to the results artfully. Leaders throughout our health care community staffing insight and direction. Employees of the American Hospital Association provided background research and assistance. Members of H&F's Advisory Board made additional advisory board meetings and served as judges for the Innovation Awards. The following is a partial list of the many individuals that contribute to the 2008 Most Wired Survey and Benchmarking Study.

Health Forum Staff: Kyle Anderson, Sarah B. Breen, Mark Galuska, Chris George, Peggy Dubick, Kevin A. Haines, Taiane Inoue, Dona Jackson, Jean Jeffery, Bob Kmetz, Peter Kouski, Chai Kuo, Jorge Lebron, Rebeca Leon, Mike Lenyszyn, Bill Sardamani, Allen Sahney, Kym Toma, Matthew Wernesh, Marty Walch

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MedAssets: Shane Duane, Mark Blumenreich, Michael Simmons, Mary Beth Navarro-Smith, R.N., Laura White

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Innovator Award Judges: Mike Albin, vice president of信息 for Allina, CentraCare Memorial Hospital, Winona, Minn.; George Ayeus, senior director, Health Data Management Group, American Hospital Association, Chicago; Ross Frazee, CEO, Valley Health System, Fort Collins, Colo.; Tim Con, senior vice president and CEO, CS, St. Luke's Episcopal Health System, Houston; John Conlin, senior vice president and CEO, Providence Health Services, Seattle; John Day, senior vice president and CEO, Parkland Health & Hospital System, Dallas; Ross Ran Leuzinger, CEO, University of Illinois Medical Center at Chicago, Chicago; David Miller, director, clinical informatics, Carol Foundation Hospital, Utica, Ill.; Tom Sip, vice president and CEO, Clinton HealthCare System, Dubuque, Ia.; Thad Pichichero, senior associate director, policy, American Hospital Association, Washington; Keith Brown, a business director, Prodigy Healthcare Services, Altoona, N.J.; Brian Ryan, executive vice president, information, Intermountain Healthcare, Salt Lake City; Bill Spence, senior vice president and CEO, Sharp HealthCare, San Diego; Rebecca Sylvan, senior vice president and CEO, Carolinas Healthcare System, Charlotte, N.C.; John Wolfe, senior vice president, Saint Lukes Health System, Kansas City, Mo.; Eric Veldman, \*content modified, senior director, Cerner; Robert T. Whiteside, senior vice president and CEO of University of Chicago Medical Center, Chicago.

Supply Chain Innovator Award Judges: Ross Brown, director, materials management, John M. Monson Memorial Hospital, Port Jefferson, N.Y.; RonnMoss Dye, vice president, supply chain management, Catholic Health System, Rochester, N.Y.; Dan Pohls, director, supply chain operations, Southwest Medical Center, Englewood, Colo.; Keith Pringle, director, materials management, Olympic Medical Center, Port Angeles, Wash.

*Members of the 2008 H&F's Most Wired Magazine Editorial Advisory Board.

Eric Katz, M.D., chief medical information officer of Eastern Maine Medical Center in Bangor, which is making a first appearance on the 100 Most Wired list in 2008. "This feedback loop will lead to rapid changes in care processes to meet the ongoing best practice changes," he says. Katz says the organization will increase investments in electronic tools to capture data during the care process and in analytic tools to encourage the resulting database. "We will also be able to abstract records in real time to ensure adherence to regulatory requirements," he says.

The key to success will be taking full advantage of the power of the technology. "Many of the systems implemented today require significant realignment of processes to achieve the expected outcomes," says Joe Davies, CEO of Berkshire Health System, Pittsfield, Mass. The organization is making its eighth appearance on the 100 Most Wired list. "New technology will only be 20 percent of the requirement to reach the goal. The 80 percent needed will come from change in the way we think, manage and operate," he says.

Ongoing Coverage
For additional Most Wired Survey results and analysis, don't miss these issues:

2008 Supply Chain Innovator Award Winners, Materials Management in Health Care, June 2008
2008 Innovation Award winners, H&F's Most Wired Magazine, Summer 2008
2008 Technology applications in the supply chain, Materials Management in Health Care, August 2008
2007 Most Wired news brief, Health Facility Management, August 2008
51 The U.S. government is a major contributor to this research.

Figure 12 ELECTRONIC SURVEILLANCE The percentage of respondents in each benchmark group that have an electronic surveillance system tied to an alarm system...

Figure 13 QUALITY INDICATOR COMPLIANCE The percentage of respondents in each benchmark group that use an automated review of CMS key indicators to provide compliance alerts...

Figure 14 DISEASE SURVEILLANCE IN 2008 MOST WIDEST HOSPITALS Methods used to track unusual trends in patient diagnoses or symptoms:

Figure 15 AUTOMATED MEDICATION RECONCILIATION Use of electronic system to perform the following medication reconciliation activities for inpatients:

Horsehead Hospital, Dover, N.H., a 2008 Most Improved organization appearing on the list for the first time. "We will further increase our emphasis on data analysis and understanding the metrics associated with quality outcomes in an effort to continue improving." Many of the Most Wired say that quality initiatives and disease management efforts will increase the spending on IT and the focus of investments. "The focus will be to understand the data that is collected in order to improve quality and outcomes," says Lynda Powers, R.N., director of information systems at Wentworth-Deacon
premise of information technology is the ability to take clinical data and adjust practices to improve patient care.

Intermountain has spent a lot of time, effort and resources on understanding quality outcomes, says Marc Probst, vice president of information systems and CIO at Intermountain Healthcare, Salt Lake City, a 2008 Most Wired organization appearing on the list for the ninth time. “We will further increase our emphasis on data analysis and understanding the metrics associated with quality outcomes in an effort to continue improving.”

Many of the Most Wired say that quality initiatives and disease management efforts will increase the spending on IT and the focus of investments. “The focus will be understanding the data that is collected in order to improve quality and outcomes,” says Lynda Powers, RN, director of information systems at Wentworth-Deauville Hospital, Down, N.H., a 2008 Most Improved organization.

“We will need systems that help move the data to the level of information and then to knowledge as we develop our knowledge workers and educate evidence-based practice,” one go-to be able to adjust practice on the fly. “We will provide meaningful reports to our communities comparing their performances to national benchmarks in real time, which will encourage them to change their care process,” says C.

Fig 12 ELECTRONIC SURVEILLANCE The percentage of hospitals in each benchmark group that have an electronic surveillance system tied to an alarm system is shown.

<table>
<thead>
<tr>
<th>Surveillance-driven alert system</th>
<th>All 2006</th>
<th>Most Wired 2008</th>
<th>Last Year</th>
<th>%...with alerts sent to these locations</th>
<th>Critical care units</th>
<th>Step down units</th>
<th>General med-surg units</th>
<th>Tied to prevent admin reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>24% 67% 1%</td>
<td>-</td>
<td>22% 66% 1%</td>
<td>16 54 0</td>
<td>17 49 0</td>
<td>6 20 0</td>
<td></td>
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</tbody>
</table>

Source: Hospitals & Health Networks’ Most Wired Survey and Benchmarking Study, 2008

Fig 13 QUALITY INDICATOR COMPLIANCE The percentage of hospitals in each benchmark group that use an automated review of CMS key indicators to provide compliance alerts is shown.

<table>
<thead>
<tr>
<th>Compliance-driven alert system</th>
<th>All 2006</th>
<th>Most Wired 2008</th>
<th>Last Year</th>
<th>%...when the patients are</th>
<th>On med-surg floor</th>
<th>In critical care area</th>
<th>In emergency department</th>
<th>At discharge</th>
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</thead>
<tbody>
<tr>
<td>17% 50% 0%</td>
<td>8 27 0</td>
<td>10 29 0</td>
<td>9 28 0</td>
<td>8 25 0</td>
<td>9 24 0</td>
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</tbody>
</table>

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Fig 14 DISEASE SURVEILLANCE IN 2008 MOST WIDEMOST HOSPITALS Methods used to track unusual trends in patient diagnoses or symptoms.

<table>
<thead>
<tr>
<th>Disease surveillance</th>
<th>Syndromic surveillance</th>
<th>Infection control</th>
<th>Hospital-acquired infection surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual only</td>
<td>50%</td>
<td>50%</td>
<td>41%</td>
</tr>
<tr>
<td>Partially electronic</td>
<td>17%</td>
<td>17%</td>
<td>41%</td>
</tr>
<tr>
<td>Fully electronic</td>
<td>33%</td>
<td>33%</td>
<td>41%</td>
</tr>
<tr>
<td>In no place</td>
<td>46%</td>
<td>46%</td>
<td>41%</td>
</tr>
</tbody>
</table>

Source: Hospitals & Health Networks’ Most Wired Survey and Benchmarking Study, 2008

Fig 15 AUTOMATED MEDICATION RECONCILIATION Use of electronic system to perform the following medication reconciliation activities for inpatients.

<table>
<thead>
<tr>
<th>All 2006</th>
<th>Most Wired 2008</th>
<th>Last Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>77%</td>
<td>69%</td>
<td>67%</td>
</tr>
<tr>
<td>50%</td>
<td>50%</td>
<td>50%</td>
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</tbody>
</table>

Source: Hospitals & Health Networks’ Most Wired Survey and Benchmarking Study, 2008

Eric Hartz, M.D., chief medical information officer of Eastern Maine Medical Center in Bangor, which is making a first appearance on the 100 Most Wired list in 2008. “This feedback loop will lead to rapid changes in care processes to meet the ongoing best practice changes,”

Hartz says the organization will increase investments in electronic tools to capture data during the care process and in analytic tools to query the resulting database. “We will also be able to abstract records in real time to ensure adherence to regulatory mandates,” he says.

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2008 Innovator Awards

Halcyon recognizes nine organizations with two classes of awards. For the Innovator Awards, a joint project with Accenture, CHIME and McKesson Corp., a panel of 18 hospital and information technology leaders evaluated essays describing a specific IT project and named three winners and three finalists. For the Supply Chain Innovator Awards, a joint project with Materials Management in Health Care and the Association for Healthcare Resource & Materials Management, a panel of four materials management leaders judged essays on projects demonstrating innovation in the supply chain using IT. One winner and two finalists were named. For both awards, the essays must describe the project, provide a business objective and list key obstacles and solutions. The essays were judged on the project’s transportability and achievement of the stated business objective, creativity and uniqueness of concept, impact on the organization, scope of the solution, stage of implementation and technical creativity.

2008 Innovator Award Winners

Allegiance Health | Jackson, Mich. | www.allegiancehealth.org

Allegiance Health created an automated discharge call system to reduce readmissions using existing technology. The health system’s electronic document management system, which serves as the repository for all patient-related files, also manages workflows by sending the patient record and discharge information to the electronic worklists of the clinicians responsible for follow-up discharge calls. The addition of a rules-based logic to the electronic document management system enabled Allegiance to specify workflows, and new rules can be created easily to extend the application. One result of the project has been a drop in the readmission rate for congestive heart failure, from 3 percent to 1.5 percent over a three-month period.

Skaggs Community Health Center | Brenton, Mo. | www.skaggs.net

Skaggs Community Health Center decided to improve quality and productivity in the emergency department, but realized they couldn’t do so without real-time data. As a result, Skaggs created an electronic dashboard that presents data from five disparate systems. The color-coded dashboard provides clinicians with at-a-glance views to monitor staffing, learn performance, and volume and efficiency of the ED. Cost savings are currently estimated at $90,000, and staff performance has improved as a direct result of real-time views of individual performance.

Cox Health | Springfield, Mo. | www.coxhealth.com

Utilizing existing technologies as building blocks, Cox Health developed and implemented a customized electronic bedboard within a four-month period. The bedboard resolved disruptive workflow and static reporting, and decreased patient wait times and inefficient communication regarding key data. Through this system, which can be viewed on mobile devices, Cox Health increased annual turns per bed and projects an additional 3,700 bed turns annually.

2008 Innovator Award Finalists

Mercy Medical Center | Cedar Rapids, Iowa | www.mercymc.org

When Mercy Medical Center decided to require e-signing and computerized documentation, the hospital discovered its physicians were unhappy with the current health information system. The hospital implemented a single sign-on physician portal with the assistance of a dedicated physician advisory group. The portal is Web- and mobile-device-accessible, interfaces with existing systems and is used by nearby competitive hospitals. Electronic signatures for transcriptions and orders have achieved full adoption since the portal’s inception.

Baylor Health Care System | Dallas | www.baylorhealth.com

Baylor Health Care System wanted to make sure clinical trials aren’t compromised by participating patients who seek care outside the trial. So it implemented a systemwide tool that notifies the clinical research teams when a trial patient shows up at any location within the health system. An existing technology, the physician EMR portal, was used to develop the clinical trial patient tracker. Automatic cross-references with AXT applications are conducted upon each admission and e-mail and pager alerts are issued if a match is found.

Washington DC Veterans Affairs Medical Center | Washington | www.washingtondcva.gov

Challenged by the 2007 Joint Commission recommendation to standardize patient handoffs, Washington DC Veterans Affairs Medical Center volunteered to be the lead test site for a handoff tool new used throughout the VA system. The final product is a Windows application that provides an intuitive interface between the provider and the hospital information system. The handoff tool is built into the EMR tool, providing automated retrieval of patient information and pre-populated fields, as well as character-limited fields for user-entered test. User buy-in was secured by appointing a lead physician and early education to create a vested user group. The provider handoff tool will improve communications to ultimately decrease patient error.

2008 Supply Chain Innovator Award Winner

Texas Health Resources | Arlington, Texas | www.texashealth.org

Texas Health Resources developed a Web-application that uses existing software tools to streamline the budget and capital acquisition and tracking. The application provides real-time reporting of budgeted, allocated and spent dollars; improves communication among departments; and eliminates paper processing. By implementing this solution, Texas Health Resources reduced the time between request submission and purchase by 30 percent.

2008 Supply Chain Innovator Award Finalists

Mountains States Health Alliance | Johnson City, Tenn. | www.msha.com

Concerned with patient safety and standardization of key processes, Mountains State Health Alliance sought to create an automated system to manage product recalls, alerts and advisories. The system routes new alerts automatically to appropriate staff members but also allows staff to search for products by vendor, date, documents and product. Reduced staff time for manual checks and real-time status of recalls are examples of the system’s benefits.

Harris County Hospital District | Houston | www.hcohonline.com

For the benefit of patients, clinical staff, materials management and accounts payable, Harris County Hospital District initiated a project to automate the generation, transmission and receipt of invoices, provide electronic payment options and to increase accuracy of available supplies and records. The project reduced the process-to-pay average time from 120 to 30 days, and it eliminated manual ordering and invoice data entry.

IT Network Expands What’s Possible for Each Member

 readme resources. Local control. To solve the issue of access to resources for information technology, a group of 38 hospitals and health facilities ranging from a 25-bed critical access hospital to a $500-bed hospital have come together to use the information services of Inland Northwest Health Services, Spokane, Wash., a shared-services organization.

The INHS information technology network includes more than 4,000 physicians, 450 clinics and physician offices and 2.8 million electronic medical records. More than 1,000 physicians access patient records wirelessly in INHS hospitals.

Organizations that participate in INHS information technology services have access to a set of shared IT resources—including software and staffing—but make independent decisions about how to use those resources and how much to invest in IT projects. This year, 17 hospitals that use INHS services qualified for the 100 Most Wired list. Two are shown separately in the 100 Most Wired list because of their exceptional use of IT: Kootenai Medical Center, Coeur d’Alene, Idaho, and Sacred Heart Medical Center, Spokane, Wash. The other 15 were grouped into two regions for purposes of the 2008 Most Wired recognition. Those hospitals are:

Inland Northwest Health Services | Washington and Idaho Region

- St. Luke's Rehabilitation Institute, Spokane, Wash.
- Holy Family Hospital, Spokane, Wash.
- Disacness Medical Center, Spokane, Wash.
- Valley Hospital and Medical Center, Spokane Valley, Wash.
- Othello (Wash.) Community Hospital
- Valley (Wash.) Regional Hospital
- Spokane (Wash.) Community Hospital
- Mount Carmel Hospital, Coeur d’Alene, Idaho
- St. Joseph’s Hospital, Othello, Wash.
- Kennewick (Wash.) Regional Hospital
- St. Luke’s Magic Valley Regional Medical Center, Twin Falls, Idaho

Inland Northwest Health Services | California Region

- Providence Saint Joseph Medical Center, Burbank
- Providence Holy Cross Medical Center, Mission Hills
- Little Company of Mary Hospital-Fullerton
- Little Company of Mary Hospital-San Pedro

One INHS hospital was also recognized on the 2008 Most Wired-Shield and Rural award list: Muran General Hospital, Shelton, Wash.

Wiring for Consulting

Progress on hospital-based health records and patient care has been virtually stagnant for three years. There has been a sharp decline in adoption of EHRs due to the breadth of services offered by the nation’s top technology hospitals to data from the 2008 Most Wired Benchmarking Study. Those results, along with the belief that hospitals must provide PHRs and portal new concerns and services, then affect our ability to determine whether those services arc considered and accelerated our responsibility to provide reliable information on clinical data and care of the patient. The requirements for PHRs may simply be too complex for most hospitals and organizations to meet in the near term, but they are important to the future of PHRs.

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