Thank You!

Hospitals & Health Networks extends special thanks to IDX Systems Corp., Accenture, and the College of Healthcare Information Management Executives (CHIME) for their support of the 2005 Most Wired Survey and Benchmarking Study.

Thanks to Cisco Systems for an additional grant to support Hospitals & Health Networks' 2005 Most Wired® Innovator Awards.
The nation's 100 Most Wired hospitals and health systems have, on average, risk-adjusted mortality rates that are 7.2 percent lower than other hospitals. The conclusion is valid at the 99 percent confidence level and remains valid even after controlling for the data for the size of the hospital and teaching status.

The relationship between improved outcomes and information technology is documented in both the academic and practitioner research. But those studies typically examine the results of specific projects aimed at targeted safety improvements. This is the first analysis showing that hospitals with a broad use of information technology across a variety of projects also have better outcomes. However, the analysis does not establish a causal relationship between IT and outcomes.

The results come amid an ongoing dialogue at the Agency for Healthcare Research and Quality on whether the most effective use of information technology targets specific safety projects or addresses more systemic issues of quality and outcomes. This analysis also comes on the heels of several widely publicized reports on the limitations of computerized physician order entry in reducing medication errors and its potential role in creating new forms of computer-related prescribing errors.

Each year since 1999, Hospitals & Health Networks has surveyed the nation's hospitals on their use of information technology to achieve key goals, including safety and quality objectives. Based on a detailed scoring process, He-HN annually names the 100 Most Wired Hospitals and Health Systems. The 2005 Hospitals & Health Networks/Most Wired Survey and Benchmarking Study is sponsored by IDX Systems Corp., Accenture and the College of Healthcare Information Management Executives. This year, 502 hospitals and health systems representing 1,255 hospitals participated in the survey.

For the last five years, the magazine has engaged outside analysts to determine if an association could be established between use of information technology and critical goals for that technology, such as better financial performance, higher credit ratings and differences in quality measures. Solucient conducted the 2005 mortality analysis for He-HN based on comparing risk-adjusted mortality rates for the 100 Most Wired hospitals and health systems with those of the rest of the nation.

Behind the mortality analysis, the 2005 Most Wired data show three significant differences in how hospitals apply and use information technology to improve care:

- The Most Wired use a wider array of IT tools to address quality and safety than other organizations, including: CPOE, bedside electronic medication matching, automated alerts and reminders, physician portals and electronic patient surveillance.
- Among the Most Wired, significantly larger percentages of physicians enter orders themselves, compared with other organizations.
- The Most Wired conduct a larger percentage of clinical transactions—the number of doses ordered and the number of medications matched to the patient—via information technology.

Mortality Rates and the Most Wired

The 100 Most Wired have, on average, lower risk-adjusted mortality rates than other hospitals. It is critical to note that this analysis does not establish causality. (See sidebar, "The Search For Meaning: Does Information Technology Make A Difference?")

"The association is strongly suggestive, not causal, but it's an important piece of the research," says Carolyn Clancy, M.D., director of AHRQ.

This research starts with a benchmark group for hospital technology leadership—the 100 Most Wired—and asks if those hospitals have significant and discernable differences in outcomes. "It's not a random observation, even if it is not necessarily cause and effect," says Kareem Safavi, M.D., Solucient's chief medical officer. Safavi and the editors of He-HN designed the mortality analysis, along with Dave Foster, Solucient's vice president of clinical consulting. Foster conducted the analysis.

"Thoughtful institutions that pay attention to quality are also interested in clinical information technology," says Graham Hughes, M.D., vice president of product strategy for IDX. "This adds increasing weight to the notion that careful implementation of clinical IT contributes to better care."

Most chief information officers and chief medical officers say that, to be effective, adoption of information technology must be combined with clinical process improvements and a culture of safety. "What we know from the studies we're supporting is that technology is only part of the drive to improve quality," Clancy says. "It clearly has to be linked with process improvement."

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The differences in the prevalence and use of IT among the Most Wired are consistent across all five sections of the eight-page survey. (See sidebar, "About the Survey").

**Mortality Rates and the Most Wired**

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The difference in approach to IT and quality vary wide-
ly among hospitals. Information technology can play a supporting role, an organizing role or catalytic role in quality and safety efforts. Rarely, if ever, does it play the leading role in quality initiatives. In most cases, however, senior executives say that IT is one of the key ingredients necessary for improving outcomes generally and a core element of most individual safety efforts.

"IT is a contributor, but not an end unto itself. That's an important contribution of this work," says Carmela Coyle, senior vice president for policy at the American Hospital Association. "We are just beginning to understand the connection and contribution of IT to health care quality."

At AHRO, researchers routinely discuss whether IT is best used as a catalyst for systemic quality improvement or as a tool applied to individual quality and safety efforts. "We have a lively debate at the agency going on daily, almost hourly, about what is the right wedge to drive change," Ciancy says, noting that views are strongly held on both sides.

"What this survey and analysis suggests is something more holistic," says Lewis Redd, Accenture's partner-provider practice leader. He says that technology plays a role in both targeted safety efforts and systemic change. "There's no doubt in my mind that these tools lead to better processes and better outcomes."

Creating Benchmark Groups

The first step is among the core goals of the Most Wired Survey. Using survey responses, the editors created five benchmark groups, representing different levels of implementation, adoption and use of information technology as applied to safety and quality.

In this report, Most Wired refers to the list of 100 highest-scoring hospitals recognized in this year's list; All Respondents refers to the entire sample; Least Wired are the 100 respondents scoring the lowest on the survey; IT Quality Leaders refers to the 50 hospitals that scored the highest on the survey's safety and quality section; and Tech Leaders are the 60 hospitals on the Most Wired list that are not among the IT-Quality Leaders.

Note that, of the 50 top scorers in the quality and safety section, 13 are not in the 2005 list of the 100 Most Wired. That is because this section accounts for 30 percent of the survey scoring. The remaining points are divided among the other four sections of the survey. Although those 13 respondents scored highly in the safety and quality sections, their total scores were not high enough to vault them onto this year's 100 Most Wired list. The lists of the Least Wired, the IT-Quality Leaders and the Tech Leaders were created solely for analytic purposes and will not be published.

The benchmark groups are based on 502 hospitals and health system respondents, representing 1,255 hospitals. The hospitals represented in the sample tend to be larger and more urban than the national average, but the results make up a diverse sample. (See figure 8.)

Details of the Mortality Study

For the second step in the research, He-HN worked with Solucient to examine whether or not the 100 Most Wired have demonstrably different mortality rates. The multivariate regression analyses using 2003 MedPar data were conducted three ways.

The first analysis compared risk-adjusted mortality rates for the 100 Most Wired versus the rest of the nation. This analysis, which was valid at the 95 percent confidence interval, was aimed at establishing a basic correlation between being Most Wired and outcomes and was used to determine if that deeper analysis might prove worthwhile.

The second analysis compared the risk-adjusted mortality rates for the 50 top scorers on the survey's quality and safety section with both the 100 Most Wired and the rest of the nation. This analysis, which was valid at the 99 percent confidence interval, established that the data appear to stratify within the sample, again suggesting that deeper analysis might prove worthwhile.

To confirm that result, the analysis was redesigned a third time as a continuous set of variables, rather than the discrete comparison of risk-adjusted mortality rates for the two benchmark groups versus the nation as a whole. The result was a 7.2 percent difference in risk-adjusted mortality rates valid at the 99 percent level. This analysis included control variables for hospital bed size and teaching status. In other words, the differences in mortality rates were not explained by the hospital's size or the presence of clinical training programs.

This is the second year that a comparison of risk-adjusted mortality rates among the 100 Most Wired shows a statistically significant difference when compared with the nation as a whole. In 2004, the editors of He-HN chose not to report the results of the analysis based on consultation with analysts. In the 2004 analysis, conducted by CareScience, the difference in mortality rates was extremely small and was valid at the 95 percent confidence interval. In addition, the results did not show an in-sample difference; that is, the 100 Least Wired also showed this very small but statistically significant difference in mortality rates. This year's results show an association between outcomes and IT, but do not establish that the outcomes were caused by the technology.

Differences Among Hospital Activities

For the mortality results to have meaning, they should be matched by differences in the use of technology among hospitals. This is the third step in the analysis. Using the five benchmark groups, the editors compared average responses and found large order-of-magnitude differences in the implementation, adoption and use of IT for quality and safety. The editors found three broad categories of difference: The Most Wired use a wider array of IT tools to address quality and safety, they have significantly larger percentages of physicians directly entering orders and they conduct a larger percentage of clinical activities via information technology. The editors also conducted two follow-up surveys of CIOs to explore their experiences with and opinions about IT and its influence on quality; One targeted the Most Wired and the second targeted the IT Quality Leaders. In addition, the American Hospital Association Resource Center compiled a set of recent articles from the academic literature, which was used to help set content for this report.
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Hospitals are attempting both approaches—use of IT to eliminate specific errors and the application of IT for general improvements in care—often simultaneously.

The promise of specific technologies, such as order entry and bar code medication matching, is to eliminate specific types of medical errors. The promise of a more systemic approach including decision support, electronic surveillance and ubiquitous access to information is to difference in risk-adjusted mortality rates valid at the 99 percent level. This analysis included control variables for hospital bed size and teaching status. In other words, the differences in mortality rates were not explained by the hospital's size or the presence of clinical training programs.

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increase the use of evidence-based medicine, clinical protocols and adherence to best practices, thus decreasing errors of omission and increasing the use of best practices.

Although computerized order entry received early praise in both the academic and practitioner research as a tool for eliminating medication errors, recent studies have cast a shadow over those results. Earlier this year, the Journal of the American Medical Association, the Archives of Internal Medicine and the Journal of the American Medical Informatics Association released separate studies on limitations and potential unintended consequences of CPOE. The JAMA and Archives pieces were picked up in the popular media.

"There still seems to be a reasonable amount of concern about the recent reports that, despite the amazing amount of potential to reduce errors, there appears to be a small likelihood of introducing errors through the technology," IDX's Hughes says.

Those studies fueled a simmering debate in academic and policy circles about the potential for unintended consequences of CPOE generally and, specifically, whether or not the cost of CPOE is the best use of resources for improving care.

"We need to better understand what it means, not just to have IT, but to really use it," says the AHA's Garay, pointing out the need to know more about the drivers of adoption, successful implementation and use.

The literature suggests that reducing errors through CPOE hinges on a careful analysis of the effect of IT on clinical processes, as well as physician acceptance. The reports also indicate that CPOE is tied to both medical and administrative clinical decision support, remote access and wireless strategies," says Richard Rogers, vice president and CIO, Health First, Rockledge, Fla. "Integrating, planning and executing these strategies simultaneously takes time, capital investment and resources."

Examining the 2005 Most Wired Data

There are two key comparisons of data in this analysis. First, we examined the average responses for the 100 Most Wired compared with those for all respondents and the average for the 100 respondents who scored lowest on the survey. The second comparison, which is new in 2005, examines use of IT by the top deciles in the survey's quality and safety section. The goal: Determine if the mortality results are backed by differences in behavior among hospitals.

For the second comparison, we created two new benchmark groups: the 50 top scorers in the quality and safety section of the survey and the 63 hospitals from the 100 Most Wired that did not score among the top 50 in the quality and safety section. (For definitions, see sidebar, "The Search For Meaning Does Information Technology Make A Difference?")

Physician Adoption of Order Entry

The 100 Most Wired have greater use of CPOE by clinical staff, according to 2005 survey results. There have been many efforts to measure the use of CPOE in hospitals. Those estimates vary widely, often depending on both the definition of CPOE and the wording of the survey. Some surveys measure the prevalence of CPOE systems, focusing on the number of hospitals implementing the technology. Other surveys examine physician use of CPOE, looking for general estimates of the number of doctors using the technology.

For the seventh year, Hospitals & Health Networks has named the 100 Most Wired Hospitals and Health Systems. The list is based on responses to the Most Wired Survey and Benchmarking Study that asks hospitals to report their use of information technology to address five key areas: safety and quality, customer service, business processes, workforce, and public health and safety. The 2005 survey is a joint project of HfHNS, IDX Systems Corp., Accenture and the College of Healthcare Information Management Executives.

Each year, the survey undergoes an extensive review to identify new questions and to eliminate outdated questions. The survey drafting team conducts an initial review of the survey, eliminating, modifying and creating new questions for comments by survey reviewers. In addition, reviewers are asked to suggest new topic areas for the survey. Based on those comments, the drafting team creates a second version that a broader set of leaders throughout health care then review. The drafting team takes all the comments, evaluates them, modifies questions and finalizes the survey. (For a list of the 2005 survey team, see sidebar.) Every hospital in the United States received multiple invitations to participate. The survey was in the field for two months, from mid-January to mid-March. The electronic survey tool includes electronic cross-checks that prevent contradictory answers to related questions. Responses reflect technologies fully implemented as of March 1, 2005. Respondents may complete the survey for an individual hospital or for a health system. Health system respondents are asked to provide estimates of the systemwide averages for each question.

After the survey closes, the editors verify 10 percent of the responses with a follow-up survey. The team chooses the hospitals based on a variety of criteria, including large changes in year-over-year responses and lack of change in year-over-year responses, extremely high scores by new respondents and responses to test questions on the customer service section that appear inconsistent with hospital Web sites. The verifications include both general questions and questions tailored to each organization, which is asked to correct mistakes and to certify respondents' answers.

Each survey was scored using a methodology that emphasizes the use of IT for patients and customers, with 60 percent of the points allocated among the three related sections of the survey: safety and quality, customer service, and public health and safety. The remaining 40 percent of the points target hospital operational,日常工作, and business processes. (See figure 9.) The specifics of the scoring are kept confidential to minimize gaming the results. Some questions are scored and some are not. The results are based on several annual awards:

- 100 Most Wired—The 100 organizations scoring highest on the survey
- Most Wired—The 25 organizations scoring highest on the survey focused on wireless applications
- Most Improved—The 25 organizations not appearing on the Most Wired list whose score improved the most from 2004 to 2005
- Most Wired—Small and Rural—The 25 small and rural organizations not appearing on the Most Wired list scoring highest on the survey.

As the result of the inherent value judgment in any scoring system, HfHNS does not publish the rankings. Each organization completing the survey receives a customized report comparing its responses with the 100 Most Wired organizations. HfHNS also recognizes specific IT achievements with the Innovator Awards. The Innovator Awards are supported with an additional grant from Cisco. The winners will be profiled in the Summer 2005 edition of HfHNS Most Wired Magazine, which will be mailed in August. For a brief description of the winners, see the inside foldout. All winners will be recognized at the 2005 Health Forum Summit, July 28-30, in San Diego.
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The literature suggests that reducing errors through CPOE hinges on a careful analysis of the effect of IT on clinical processes, as well as physician acceptance. The reports also indicate that CPOE requires more than just the use of technology and has to be combined with clinical decision support. That mirrors the experience of the 100 Most Wired.

"For the benefits of CPOE to be realized, it must be part of a much broader strategy integrating clinical documentation, medication administration, clinical decision support, remote access and wireless strategies," says Richard Rogers, vice president and CIO, Health First, Rockledge, Fla. "Integrating, planning and executing these strategies simultaneously takes time, capital investment and resources."

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"Physicians are the ones who need it. They need a system that can keep their patients safe. It's probably the most critical aspect of any system," says the AHA's Garley. "The biggest hurdle to adoption is education. It's hard to convince some physicians that they need it. It's going to take time."
“We did not fully realize how difficult the battle would be to change physicians ordering practices,” says Steve Pelton, CEO, Central Region, Ministry Health Care, Milwaukee. Still, he says the effort will continue, “As an industry, we are regrouping and learning from the experiences.”

One factor that could affect adoption rates is the availability of order entry. The Most Wired provide clinicians with access to CPOE functions from more locations. At least 30 percent of respondents say they provide access from physician offices, ambulatory settings or other remote locations, compared with no more than five percent among the Least Wired. Again, the contrast with the IT Quality Leaders is stark: 94 percent say they provide CPOE access from physician offices, 86 percent provide access from ambulatory settings and 82 percent provide access from other remote locations. (See figure 2.)

“The impact on physician culture has been grossly underestimated, especially at organizations with voluntary medical staffs,” says Ron Strachan, vice president and CEO, HealthEast Care System, St. Paul, Minn.

Adoption rates measure the percentage of clinicians who routinely use the technology; establishing a baseline for organizational comparison. But they do not distinguish between frequent and infrequent use of computerized order entry or whether top clinicians have embraced IT. As a result, adoption rates are a relatively weak proxy for the volume of clinical level activity managed electronically.

Medication Safety

At the clinical level, the Most Wired Survey asks respondents to estimate the percentage of medication orders that are entered electronically and who enters them. It also asks respondents to estimate the number of doses electronically matched to the patient.

The Most Wired excel at both ends of the medication delivery process. Among the Most Wired, 28 percent of medication orders are entered electronically by physicians, more than twice that of all respondents and 14 times greater than the Least Wired, where less than 2 percent of medication orders are entered electronically by doctors. The difference is even more dramatic compared with the IT Quality Leaders, where physicians enter 42 percent of medication orders electronically. (See figure 3.)

The results are duplicated at the other end of the medication delivery process. Among the Most Wired, an average of 23 percent of medications are electronically matched to the patient and the order at the bedside, compared with 14 percent for all respondents and 1 percent among the Least Wired. The difference is even more dramatic for the IT Quality Leaders, where 41 percent of medications are electronically matched to the patient and the order at the bedside. The Most Wired and Tech Leaders (the 63 hospitals on the 100 Most Wired list that are not among the IT Quality Leaders) are more likely to support their use of bedside medication matching with automated medication dispensing devices away from the bedside. (See figure 4.)

Decision Support

Both provider and academic literature identify the use of decision support as key to the successful use of IT to improve care. Among the nations IT Quality Leaders, there is pervasive use of electronic alerts by physicians, nurses and pharmacists, where the rates of full adoption range from 48 percent to 100 percent. That contrasts with the Least Wired, where clinicians are much less likely to use computer-driven alerts. Full adoption rates among the Least Wired range from 6 percent to 87 percent, with duplicate orders, drug-drug interaction, dose checking and allergy alerts being the most common. (See figure 5.)

Pharmacists are most likely to use decision support, but there is still a large gap between the nations IT Quality Leaders and the Least Wired. The gap is even larger among nurses, but they are reaching full adoption rates for alerts and remiders faster than physicians.

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The contrast in full adoption rates is most dramatic for physicians. Among the Least Wired, only 10 percent have achieved full adoption of allergy alerts by doctors compared with 76 percent among the IT Quality Leaders. For each of the seven other types of alerts surveyed, no more than 5-per-
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cent of the Least Wired have achieved full adoption among physicians. The nation’s Most Wired also provide decision support more broadly to doctors via their physician portals. (See figure 6.) The most technologically advanced hospitals have linked clinical alerting with electronic surveillance. The Most Wired are more likely to have an alert system tied to a surveillance system that monitors patient vital signs, lab test results and other clinical information designed to notify caregivers of deterioration in a patient’s condition before an adverse event occurs. (See figure 7.)

The Quality Connection

"Technology is a tool to improve quality, but it is the people and the process of using technology that drives outcomes to improve," says C. Lynne Ruyer-Wilkoby, a nurse and director of medical informatics at Communi-ty Health Network, Indianapolis, "It is the means to the end, not the end." Some CFOs say that the technologies, while promising, need more time. Others say that the application of technology to changing hospital outcomes and, more broadly, improving population health, is a much steeper learning curve than ever anticipated.

"The holy grail is to deliver evidence-based medical practice to the patient at the point of care to improve quality," says AHRQ’s Clancy.

Among the 100 Most Wired, IT is in high gear across a broad range of goals: reducing errors, increasing use of evidence-based medicine, fixing processes and improving outcomes. But, CFOs say, the technology itself is beside the point.

"The most important role IT has in improving outcomes is its ability to provide the right information at the right time to the provider," says John Burke, CFO, Indianapolis VA Medical Center. "IT has become a critical tool in the care and treatment of patients at our facility. Without it, quality and timely care is not possible." •

THE MOST WIRED TEAM

The Most Wired Team

HMHI represents the support of many individuals who contributed to the success of the Most Wired Survey and benchmarking study, the Innovator Awards and the research and analysis that gave rise to this issue article. Leaders throughout health care assisted in providing insight and directors. Employees of the American Hospital Association’s policy staff and Rosenow Center provided background research and perspective. Members of HMHI’s Most Wired editorial advisory board reviewed the survey and served as judges for the Innovator Awards. The following is a partial list of the many individuals who contributed to the 2005 Most Wired Survey and Benchmarking Study.

Health Forum staff: Kyle Anderson, Kate Aumer, Peggy Duglas, Kimberly A. Hopkins, Susanna Hooper Dembroski, Celley Jackson, June Jaffe, Jennifer Kerr, Peter Krosnak, Chuck Luo, Steve Nyczuk, William Sattom, Amanda Selby, Jennifer Timmer, Matthew Wierzbicki, Merryl Weisberg

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EY Systems Corp. staff: Jamie Gar, Graham Hughes, MD, Mike Mayer, Mark Quinlan, MD

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Fred Farah, vice president and CIO, Hershenson, St. Louis, University Medical Center.
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John Jencke, president and CEO, Minnesota Children’s Health System, Minneapolis.
Mike Kelly, information systems director, Alice Hyde Medical Center, Malone, N.Y.
Doreen Morrison, COO, Concord (N.H.) Hospital, Rensselaer, N.Y., vice president and COO, Memorial Healthcare, O:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\:\\
THE MOST WIRED TEAM

The Most Wired Team

MDM represents the support of many individuals who contributed to the success of the Most Wired Survey and Benchmarking Study. The Most Wired are more likely to have an alternative system tied to a surveillance system that monitors patient vital signs, lab test results and other clinical information designed to notify caregivers of deterioration in a patient’s condition before an adverse event occurs. (See figure 7.)

The Quality Connection

"Technology is a tool to improve quality, but it is the people and the process of using technology that drives outcomes improvement," says C.J. Lymne, Vice President of Technology and Director of Business Development, Hitachi Medical Imaging, adding, "It is the means to the end, not the end itself."

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THE 100 MOST WIRED

2005 Most Wired Survey Reviewers and Definitions Board

Dana Agron, director, clinical applications, Presbyterian Healthcare Services, Albuquerque, N.M.; Wil Macler, vice president of finance, Phoenix, Ariz.; Christopher Bouda, vice president of corporate management information systems, Northeast Health, Troy, N.Y.; Ray Darr, senior vice president and CIO, St. Luke’s Episcopal Healthcare System, Houston, Texas; and Mike Zed, CEO, CIO, Health Technology Center, San Francisco, Calif.; Fernanda di Tullio, vice president and CIO, Healthmark, PLU, University Medical Center, Seattle; Freddie Cray, CIO, Children’s Hospital of Health and Education, California; Darrin Jones, chief information officer, University Health, Chicago, Ill.; Mike Gifford, CIO, University of Washington, Seattle; David Glass, CIO, Conemaugh Health System, Johnstown, Pa.; Paul Goepel, vice president and CIO, Memorial Healthcare, North Miami Beach, Fla.; Michael Hachez, CIO, Louisiana State University Medical Center, New Orleans, La.; Mike Healy, CIO, Texas Health Resources, Dallas; Jeff Heim, CIO, Vanderbilt University Medical Center, Nashville, Tenn.; Joe Hinojosa, CIO, University of ColoradoHealth, Denver; Jared Jackson, CIO, University of Arizona Health Sciences, Tucson; Paul Johnson, vice president and CIO, Cigna Healthcare, Phoenix; and Robert Johnson, CIO, Cigna Healthcare, Phoenix.

Innovator Award Judges

Paul Anthony, vice president, ETMC Regional Healthcare System, Tyler, Texas; Eugene Aronow, senior director, health data management programs, American Hospital Association, Chicago, Ill.; Lisa Bellamy, vice president and CIO, St. Luke’s Episcopal Healthcare System, Houston, Texas; David Cines, CIO, University of Arkansas for Medical Sciences, Little Rock, Ark.; and Garland Colwell, senior vice president and CIO, University of Oklahoma Hospital, Oklahoma City, Okla.; John Draper, vice president and CIO, Partners Healthcare, Boston, Mass.; Linda Kelly Hill, vice president and CIO, Saint Alphonsus Regional Medical Center, Boise, Idaho; Jonathan Ehrich, vice president and CIO, Rockford (Ill.) Health Systems; and Robert E. Morrison, CIO, Conemaugh Health System, Johnstown, Pa.; D. Mark W. Gasser, MD, vice president for quality leadership, American Hospital Association, Washington, D.C.; Ken Kope, vice president and CIO, Memorial Healthcare, North Miami Beach, Fla.; Robert A. Plotkin, vice president and CIO, St. Bernard (La.) Hospital, Slidell, La.; and Robert Witte, CIO, Children’s National Medical Center, Washington, D.C.

What’s Cool, What’s Real

What’s Cool, What’s Real

Whimsy, greatness: Information technology is about better care

Exactly one year ago a reporter asked me: What does a wired hospital look like? The question came after Hospitals & Health Networks announced the results of last year’s Most Wired Survey and Benchmarking Study. The survey generates significant local and national media attention. The reporter trying to make the data more accessible to a general audience, wanted to know what a patient would see in a top tech organization.

I did not cooperate.

My response: ‘You’re asking the wrong question. The right question is: What will a Most Wired hospital look like? How will it behave differently? What will it do differently? Patients may see more computer devices of all sorts, but behind the technology, the process of providing high quality care will shift dramatically.’

I impressed myself. I thought it was a great answer. The reporter, however, disagreed. I wound up on the unfamiliar other end of giving an interview and not being quoted. Bummer.

Today, I have a new answer. It’s not a better answer, but it’s richer and—to a point—it makes for better sound bites.

I’d say: ‘There’s what’s cool and there’s what’s real. Cool is a Star Trek-like communicator badge so doctors can immediately connect. Real is the ability for nurses to share information at the point of care instantly.’

And I’d say: ‘Cool is electronic monitors sending real-time information into the medical record. Real is a smart system that takes that data, predicts a downturn in a patient’s condition and sends an electronic alert to your doctor... before it happens.’ (I’d actually put that pause into the sentence. To make me look thoughtful and intelligent. For television.)

And, to drive it home, I’d say: ‘Cool is a radio frequency armband for patient tracking and TD. Real is fewer medication errors, fewer surgical errors and faster movement of the patient from room to test back to the room.’

Then the kicker: ‘You see, you’re asking the wrong question. It’s not, what does a wired hospital look like? It’s what will a Most Wired hospital act like?’

Pretty tricky, huh? This is precisely the same answer I gave last year, scripted for quoting.

It’s not the technology. It’s how we use it. That’s the headline from this year’s Most Wired Survey too. (See page 36.) In the end, IT is about how we provide better, safer care with better outcomes, at lower cost and with the highest possible patient satisfaction.

Ask any CEO. Ask any CMO/CEO or CIO. Ask them about changing the process of care for the better.

Quality care comes from the alchemy of great processes, top-flight staff, clinical technology, information technology, evidence-based medicine, patient-centered care and a culture of safety. That’s just for starters.

Technology is just a tool. But look at it. It’s a cool tool. Reporters want whizbang gizmos. Who am I to deny them?"
Thank You!

Hospitals & Health Networks extends special thanks to IDX Systems Corp., Accenture, and the College of Healthcare Information Management Executives (CHIME) for their support of the 2005 Most Wired Survey and Benchmarking Study.
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**About the Rankings:**

The rankings are based on various factors including the number of wired hospitals, ownership type, and IT staff. Each year, hospitals are evaluated based on their IT infrastructure and staff, leading to a dynamic list that evolves over time. The rankings are subject to change annually as new data is compiled.

**Innovator Award:**

The Innovator Award recognizes hospitals that demonstrate excellence in IT and technological advancements. It is an annual award given to hospitals that have significantly improved their IT capabilities and infrastructure.
The Most Improved

Albemarle Hospital  | Elizabeth City, N.C. (www.albemarlehospital.org)
Alice Hyde Medical Center  | Malone, N.Y. (www.alchydemed.com)
Bassett Army Community Hospital  | Fort Belvoir, Va. (www.bassettarmyhospital.com)
Beaufort Memorial Hospital  | Beaufort, S.C. (www.bmghospital.org)
Blanchard Valley Regional Health Center  | Findlay, Ohio (www.bvhr.com)
Citizens Memorial Hospital  | Bolivar, Mo. (www.citizensmemorialhospital.com)
Colombus Regional Hospital  | Columbus, Ind. (www.crh.com)
Concord Hospital  | Concord, N.H. (www.concordhospital.com)
Fort Madison Community Hospital  | Fort Madison, Iowa (www.fmchospital.com)
Good Samaritan Hospital  | Winnfield, La. (www.goodsamaritan.com)
Hendry Regional Medical Center  | Bradenton, Fl. (www.hendreymedical.com)
Marion General Hospital  | Marion, Ind. (www.marblog.org)
Martin Army Community Hospital  | Fort Benning, Ga. (www.martindemilary.com)
Mount Carmel Hospital  | Columbus, Ohio (www.mountcarmelhospital.org)
Peninsula Regional Medical Center  | Salisbury, Md. (www.prmc.org)
Peninsula Hospital  | motel55.com (www.peninsulahealth.org)
Robert Packer Hospital  | Sayre, Pa. (www.rpchealth.org)
Sisters Hospital  | Albany, N.Y. (www.sistershospital.org)
St. Mary's Stannah Medical Center  | St. Mary's, Md. (www.smstannahhospital.org)
Somerset Medical Center  | Somers Point, N.J. (www.somermedical.com)
St. Clare Medical Center  | Crawfordville, Fla. (www.stclaremedical.org)
St. Peter's Hospital  | Szczesny, Mont. (www.szczesnyhospital.org)
University of Chicago Hospital  | Chicago, Ill. (www.uchicago.edu)
West Virginia University Hospitals  | Morgantown, W.Va. (www.wvu.edu)
Wright Medical Center  | Clintonville, Iowa (www.wrightmedical.org)

The Most Wired—Small and Rural

Albemarle Hospital  | Elizabeth City, N.C. (www.albemarlehospital.org)
Alice Hyde Medical Center  | Malone, N.Y. (www.alchydemed.com)
Bassett Army Community Hospital  | Fort Belvoir, Va. (www.bassettarmyhospital.com)
Beaufort Memorial Hospital  | Beaufort, S.C. (www.bmghospital.org)
Blanchard Valley Regional Health Center  | Findlay, Ohio (www.bvhr.com)
Citizens Memorial Hospital  | Bolivar, Mo. (www.citizensmemorialhospital.com)
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Concord Hospital  | Concord, N.H. (www.concordhospital.com)
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Martin Army Community Hospital  | Fort Benning, Ga. (www.martindemilary.com)
Mount Carmel Hospital  | Columbus, Ohio (www.mountcarmelhospital.org)
Peninsula Regional Medical Center  | Salisbury, Md. (www.prmc.org)
Peninsula Hospital  | motel55.com (www.peninsulahealth.org)
Robert Packer Hospital  | Sayre, Pa. (www.rpchealth.org)
Sisters Hospital  | Albany, N.Y. (www.sistershospital.org)
St. Mary's Stannah Medical Center  | St. Mary's, Md. (www.smstannahhospital.org)
Somerset Medical Center  | Somers Point, N.J. (www.somermedical.com)
St. Clare Medical Center  | Crawfordville, Fla. (www.stclaremedical.org)
St. Peter's Hospital  | Szczesny, Mont. (www.szczesnyhospital.org)
University of Chicago Hospital  | Chicago, Ill. (www.uchicago.edu)
West Virginia University Hospitals  | Morgantown, W.Va. (www.wvu.edu)
Wright Medical Center  | Clintonville, Iowa (www.wrightmedical.org)

The Most Wireless

Albemarle Hospital  | Elizabeth City, N.C. (www.albemarlehospital.org)
Avera Health  | Sioux Falls, S.D. (www.averah.org)
Baystate Health System  | Springfield, Mass. (www.baystatehealth.com)
Beth Israel Deaconess Medical Center/Cleveland Clinic  | Boston (www.bidmc.harvard.edu)
Cedar Crest Memorial Hospital  | Parkersburg, W.Va. (www.cedarcresthospital.org)
Carolyn Health System  | Rocky River, Ohio (www.carolynhealth.com)
Citizens Memorial Hospital  | Wyandotte, Mich. (www.citizensmemorial.com)
Covenant Health  | Knoxville, Tenn. (www.covenanthealth.com)
Duncan Regional Hospital  | Duncan, Okla. (www.duncanregionalmedical.com)
Evolve Northwest Healthcare  | Elyria, Ohio (www.evolvehospital.com)
Greenbrier Valley Hospital  | Lewisburg, W.Va. (www.greenbrierhospital.com)
Hackensack University Medical Center  | Hackensack, N.J. (www.humc.com)
Koosmo Medical Center  | Dearborn, Mich. (www.koosmo.com)
Lifespan  | Providence, R.I. (www.lifespan.org)
Mayomed Medical Center  | Brooklyn, N.Y. (www.mayomed.com)
Memorial Health  | Savannah, Ga. (www.memorialhealth.com)
North Mississippi Health Services  | Tupelo, Miss. (www.nmhs.net)
Ohio State University Medical Center  | Columbus, Ohio (www.medicalcenter.osu.edu)
Parkview Hospital  | Fort Wayne, Ind. (www.parkview.com)
Pedro Valley Health System  | Fort Collins, Colo. (www.pvhs.org)
Rush-Copley Medical Center  | Aurora, Ill. (www.rushcopley.com)
Saint Praxie Memorial Hospital and Clinics  | Prairie du Sac, Wis. (www.srpmh.org)
Toledo  | Cincinnati (www.toledohealth.com)
Wadsworth-Rittman Hospital  | Wadsworth, Ohio (www.wadsworthhospital.com)
Talkeetna Haven Hospital  | Talkeetna, Al. (www.talkeetnahospital.com)

Innovator Awards

HeINr recognizes six organizations with Innovator Awards, a joint project of Cisco Systems, HeINr, IDx, Accenture and CHIME. Hospitals are encouraged to submit a 10-page essay that highlights the adoption of a specific innovation project. The essays must describe the project, provide a business objective and list key obstacles and solutions, among other things.

This year, a panel of 19 judges (see accompanying list, pg. 50) evaluated 58 essays to determine three winners and three finalists. The essays were judged on the universality of the stated business objective, creativity and uniqueness of concept, impact on the organization, scope of the solution, stage of implementation and technical creativity. Here are the winners and finalists for the 2005 Innovator Awards.

Winners

Baylor Health System  | Dallas, Texas (www.bhs.com)

Employs a wireless-activated exploration for registration that integrated existing workflow systems. The open archiving minimized wait times, eased congestion at the front desk and reduced the need for paper forms. Patients in the breast imaging center, where the workflow tools were introduced, can scan a driver's license or credit card through an electronic reader card, thereby eliminating the need for paperless data entry, allowing quick cross-referencing of registration material, verification of current and future appointments, and processing of any co-pay requirements.

Richard L. Roudebush VA Medical Center  | Indianapolis, Ind. (www.vamc-Indianapolis.org)

Implemented a pilot program, taking e-discharge of a discharge planning system to reduce clinic wait times and thereby reducing room rates, and to address patients' dissatisfaction with having to travel to a centralized clinic for annual exam races. The program is linked to the e-discharge electronic health record system. The system identifies patients at risk for disordered eating and generates annual reminders to call center nurses. The nurse contacts the patients to ask if they have already received an annual eye exam. The reminder is cleared if the patient has received the necessary treatment or the nurse can schedule an eye exam at the patient's previous ophthalmic clinic. The system ensures patients receive timely eye exams and don't fall through the cracks.

Texas Health Resources  | Arlington (www.texashealth.org)

Created a Web-based application that collects and analyzes actual medical errors and near-misses. The Safety Action Learning Tool was deployed to 20,000 employees within nine months. The system pushes rf-identified reminders to managers, pharmacists and risk managers for appropriate action. Confidentially events are linked to appropriate managers immediately. Managers can review events for their specific department, risk managers are able to access all events within the hospital and pharmacists have access to all medication events within the EHR. The review component allows the appropriate person to communicate, coordinate and learn from each event, resulting in a 75 percent reduction of adverse event cycle time.

Finalists

Benson Sevices Richmond (Va.) Health System  | www.bensonser.com

Provided laptop Internet access for patients in the medical intensive care units. Using NICU, parents can be able to view the neonatal unit from home, allowing them that their baby is comfortable and that he or she are needs are being met. Parents call the NICU when they would like to view their baby and the nurse places a camera at the baby's bedside. The hospital found that the system builds parents' confidence in their ability to care for the infant because they become more familiar with the baby's routine and appearance. The system is relatively inexpensive, employing laptop-top camera for 16 newborn beds. Privacy aspects were addressed by positioning the camera on the baby only, providing no sound or recording capabilities and automatic cutoff after two hours (parents are able to reactivated the camera any time). Parents are informed that camera may be turned off during treatment.

Miami Children's Hospital  | www.mich.com

Improved infant survival rates following congenital heart surgery by combining clinical information systems with point-of-care diagnostics. Clinicians and intensivists are able to access patient data through a single Web interface. The program generates and saves patient progress notes, vital signs, radiology reports, lab results and real-time patient images on a daily basis as well as interactive diagnostic images. It also connects the heart team and referring physicians across the state. The solution provides health information whenever and wherever treatment decisions are being made. It has produced a 29 percent reduction in infant mortality rates among the highest risk groups and a 63 percent decline in overall deaths.

University of Colorado Hospital  | Denver, Colo. (www.ucolosp.edu)

Developed a Web-based system to provide direct communication between the CIO of the hospital and clinicians and patients immediately following their clinic visit. Patients receive a standardized, personalized e-mail and are asked to respond to three questions and provide comments. The CIO personally replies to all comments, negative or positive. Survey results are available to physician and clinic leaders. A summary of the previous year's results are posted on the hospital Web site. The system provides timely feedback from patients, rapid response to patient concerns and creates a population of connected patients that the organization believes will be valuable for the success of future Web-based initiatives.