information edge

Healthcare Leaders Report
Scottsdale Institute 2004 Spring Conference

EXECUTIVE SUMMARY

The eleventh annual Scottsdale Institute Spring Conference, "Meeting the Future: The Role of IT and Process Improvement," was held April 14-16, 2004, at the Camelback Inn in Scottsdale, Ariz. A record attendance of executives from leading healthcare organizations and government agencies provided a veritable Who's Who of healthcare. All the presentations are available in the members-only section of our website at www.scottsdaleinstitute.org.

Stan Nelson, SI's Chairman, welcomed everyone and gave a summary report on SI's programs. He invited everyone to the fall conference to be held at Partners Healthcare in Boston, Sept. 30-Oct.1, 2004, and the winter conference, to be held at Intermountain Healthcare, Salt Lake City, Feb. 3-4, 2005.

SI membership has climbed to 43 provider systems representing 370 hospitals and 84,000 beds. We have eight program partners who add important resources to SI. Teleconference programs grew to 64 last year, with quality management and performance improvement as the most popular topic. Mr. Nelson noted that the teleconference program is an incredibly efficient and effective way to share a lot of good information, especially in a time when travel time and costs are at a premium.

Keynote Address
"BPE, BP, EFP and IT"
Gary A. Mecklenburg, President and CEO, Northwestern Memorial Healthcare, Chicago

Don Wegmiller, Chairman, Clark Consulting-Healthcare Group, and Vice Chairman of SI, introduced Mr. Mecklenburg, who is also chairman of NAHIT, the National Alliance for Health Information Technology, past chairman of the American Hospital Association and board member of the Institute for Health Care Improvement.

Mr. Mecklenburg discussed 1) How disciplined IT strategy helps organizations achieve success; 2) Whether it's possible to effectively use IT to achieve strategic differentiation; and 3) The role of IT in addressing the challenges facing U.S. healthcare today.

Mr. Mecklenburg used Northwestern Memorial Hospital as a case study. As the second-oldest hospital in Chicago, NMH is very much a community hospital, serving the diverse downtown community, including rich and poor. The hospital—825 beds, 6,000 employees and over 40,000 admissions a year—has a reputation for financial strength and quality, and has been ranked by the people of Chicago as the most preferred facility (National Research Corp. Consumer's Choice Award). Managing growth is the number one issue.

Improving Healthcare Performance Through Information Management and Process Improvement

Growth up, cost down

"If we look back over the last almost 20 years, our cost per admission in constant dollars is actually less than it was then, and so the success and the construction we've done is in part because of very strong cost management; and patient satisfaction is high compared to our peers," he said. The organization has added 2,000 employees, almost 50%, over the last 20 years, but has been able to decrease turnover and vacancy rates in nursing and other areas. In terms of productivity, the ratio of FTE's per case has also dropped 35% over the last 15 years.

Northwestern Memorial Hospital

Mr. Mecklenburg emphasized that NMH is strongly committed to strategic planning, which involves "measuring everything." Since he arrived 19 years ago, the organization has done only three

Gary Mecklenburg, President & CEO, Northwestern Memorial HealthCare, Chicago

strategic plans, which provide organizational focus and are translated into individual goals and incentives for virtually every employee. "We use incentive compensation as aggressively as any healthcare organization in the country. A huge part of our management compensation is at risk, and over the years we've been able to push that down to literally every employee in the organization. Every employee is eligible for incentive compensation, and so strategy then drives literally everything we do," he said.

The master strategic plan drives a whole series of other planning activities from fundraising to community services to physician planning, financial planning and information systems planning as well.

Big three acronyms

After the new building opened in 1999, future strategy was distilled to just three goals: *First*, to provide the best patient experience (BPE) from the patient's perspective. *Second*, to recruit, develop and retain the best people (BP) who share the organization's values and achieve results. *Third*, added this year, "because we've got a $1.5 billion capital plan for the remainder of this decade," to develop the resources to achieve the mission and vision through exceptional financial performance (EFP).

IT is a critical component of all 3 key strategies. Team performance is highly prized rather than individual performance, and that goes for the vast majority of senior management incentives. Tim Zoph, Northwestern Memorial's long-term and distinguished CIO, is a part of that team. "The CIO is an extraordinarily important part of the senior management team and IT is a key component of strategic planning. This factor is no longer debatable as it might have been five to 10 years ago," he said. Therefore, Northwestern Memorial's IT plan is to provide technology support of BP, BPE and EFP corporate strategy.

"One of the things we've learned is that IT doesn't own systems. IT supports systems, but it's the specific senior operational executive in our organization with ultimate responsibility," Mr. Mecklenburg said. CIO Zoph and Julie Creamer, VP Operations & Quality, have demonstrated how well this strategy works. Ms. Creamer owned the clinical systems that were being installed; Mr. Zoph and his team were there to help plan and execute, but that ownership concept has been very important.

Because of the challenge of getting multiple IT systems to talk to each other, the

organization has simplified the number of IT vendors down to two: one for clinical information and one for administrative systems. "We now make technology decisions based upon measurable value to the organization, whether financial or operational or in some other way, and on sponsorship. IT is responsible for providing the secure, reliable, available and cost-effective infrastructure to make it happen," Mr. Mecklenburg said.

Platform for IT success

A huge part of the new building opening five years ago was creating a platform that could provide technology solutions as far out as possible, to offer a flexible infrastructure for the future of the organization. "How we view implementation of our clinical information system is an example of our philosophy and how we've been successful: We believe that in everything we do, we have to do the basics well, lay the foundation first," Mr. Mecklenburg said.

You cannot start with CPOE, for example, even though there's huge pressure to implement it. Instead, you must start with the fundamental infrastructure, then work on the ancillary systems such as pharmacy, reporting, order entry, imaging. From there, you can move into clinical areas such as medication administration systems and bedside nursing documentation.

"We didn't jump to the physician first," said Mecklenburg. "By having a very successful nursing system, what we see now is physicians looking over the nurse's shoulder and saying "I want that, you know, where's my bedside computer?" That sets the stage for CPOE and the full electronic medical record and the data repository that can be eventually rolled out to the entire medical staff. "We may not get to CPOE as fast as

others would like, but we firmly believe that when we bring this up this coming year, we will have done it correctly," he said.

Not touched by human hands

Other examples of how Northwestern is implementing IT to improve quality and reduce errors: automated laboratory that uses bar coding so that a specimen never has to be touched by hand; CPOE, PACS, wireless handheld PDAs for residents to do bed and patient tracking, and nursing documentation.

Using IT for bed and patient tracking, has a ripple effect. "We found we can predict ER volume, and then can predict bed utilization. We know at the end of the day how many X-ray techs and how much time we've got to reserve on CTs and MRs, how many ICU beds we need, how many beds we have to keep vacant, all those things result in efficient planning and greater patient satisfaction and stops backup in the ER," said Mecklenburg.

One of the remaining barriers to strategic use of IT is the history of failed systems and failed vendors, which has resulted in anger and lack of trust. Vendors ask, "Why does every hospital have to be unique in its IT needs and unable to take an off-the-shelf system?" If every airplane was unique for every airline, where would we be? If every ATM card was unique to its own bank, if every cell phone was unique to the person selling it, they'd have the same problems in IT that we do. We aren't all unique, and we have to realize that we must have common systems, he said.

Another barrier: high cost. We have under-invested in IT, spending only about 2% or thereabouts of our annual operating budgets. Other service industries invest up

to 10%. One of the great public policy discussions going on in Washington right now is how we are going to find the money for that capital investment.

Back to the future

A third barrier: lack of common standards, related to the uniqueness issue mentioned above. Bar coding is 30-year-old technology but healthcare is just adopting it. "But the real issue," said Mr. Mecklenburg, "is that, unlike banking, cell phones and other industries, we have failed to bring together providers, associations, suppliers, vendors and government to agree on common standards for bar coding, CPOE and the like. And so the question is, where's the leadership to come forward that's going to attack some of these barriers."

He cited the recent Leapfrog Group survey. In late 2003 they targeted a group of 1,100 hospitals and only 4.9% fully meet Leapfrog CPOE requirements today. "The real fascinating thing is that only 17% expect to commit to CPOE by 2005, and that's actually declined from last year when 25% said they'd meet CPOE standards. It seems we're either going backwards, perhaps we don't have the money to invest, or perhaps we're realizing that there's a whole lot of fundamentals to do before we can really get to CPOE."

The National Alliance for Health Information Technology is an organization focused on the specific issue of standards. NAHIT's four primary goals are to:

1. Serve as a convener of the diverse interests, leadership, policy and decision-making people to force us collectively to make the tough decisions on what standards need to be adopted.
2. Provide leadership in bringing people together to reach common agreement and accelerate development and implementation.
3. Educate government on consensus of the private sector and understand how government actions will impact the private sector.
4. Sharing knowledge by developing communities of practice to share successes and failures.

The panel responds

Jim Anderson, president and CEO of Cincinnati Children's Hospital Medical Center, defined the differences between a mere quality assurance program and fundamental transformation of an organization.

The first is **senior leadership involvement**. The "very soul of senior leadership" is committed to transformation in a very fundamental way, to make radical change in the way we deliver healthcare. It starts with the board of trustees, the chairman of the board, certainly the CEO, all the medical leadership, nursing leadership, the full gamut of senior leadership involvement, and it has to happen through various mechanisms on a daily basis. Transformation is talked of daily, is expected daily, is supported daily, and change is a way of life. The goal is to set higher goals, to accelerate the pace of change and support it.

The second characteristic is **transparency**. "You must be willing to talk about the bad stuff and the good stuff and create an environment in which you are open to involving people who can be credibly critical of what you're doing. We do this with involving parents, each other, and are just very open to talking virtually about anything that goes on in the institution—particularly things that don't go well, so we can get them

on the table and start fixing them," said Mr. Anderson.

The third characteristic is **institutional support for transformation**. Cincinnati Children's encourages employees to generate both IT and non-IT process improvements. "We try very hard to make it really easy for somebody to change something, so that when somebody has a good idea we're quick to give them all the resources they need. We're relentless in making sure those solutions get implemented and made sustainable," Mr. Anderson said.

The final characteristic is **measurement**, not of everything, but certainly everything important. It has to be a robust part of transformation, involving Ph.D. statisticians who can analyze, report and continuously monitor the effects of change over time. The physician community requires that kind of credible measurement capability.

Stimulating change

Mr. Anderson said that **families and trainees** can be a great lever for change. "Families can say things to physicians and nurses with a level of credibility and impact that far exceeds anything I or most colleagues can say." Family involvement coupled with transparency, institutional involvement and measurement will precipitate change. Trainees have many of the same characteristics. "They haven't lived in a healthcare system long enough to know that ineffective processes are normal," he said.

Another lever for change is found in **biomedical breakthroughs**. Cincinnati Children's is involved in research, creating a lot of new knowledge. Leveraging that research to change patient care can produce transformation.

Crying need for leadership

Jim Skogsbergh, president and CEO of Advocate Health Care, Chicago, said, "We're remarkably at the same place as Northwestern Memorial in terms of implementation. My first observation is that I couldn't agree more with what Gary said about the state of the industry and the need for leadership." Mr. Skogsbergh agreed also that CIOs play an integral role in that leadership. "Bruce Smith is Advocate's CIO and an absolutely essential part of our senior leadership team," he said.

Jim Skogsbergh,
President & CEO,
Advocate Health Care,
Chicago
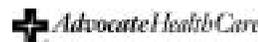
Advocate has identified itself first and foremost as a clinical enterprise. "We beat that drum every single day and it's allowed us to adapt technology easier than otherwise, because I believe the focus on clinical outcomes and patient safety resonates with our staff," he said, adding, "We do not sell our IT investment as a means of cost savings at all. Now, we would absolutely like to garner some cost savings from IT, but we are out front daily talking about this as a patient safety issue. An investment in IT is really an investment in clinical care."

Another observation: IT is all about execution. It almost doesn't matter what product you select, because different organizations have different needs. Change management and execution are the key factors to success in IT. For example, Advocate planned to roll out CPOE at a flagship hospital for the 1,500 physicians on medical staff. However, as rollout got closer, management opted to be less aggressive. "We

rolled it out with 15 residents because we really want to take this a little bit at a time, and we want to make sure we achieve success. If the worst thing is that other physicians say, 'Hey, what about me, when do I get mine?' That's a good situation to be in, as opposed to, 'You did this way too fast, way too aggressively,'" said Mr. Skogsbergh.

"Finally, we have no shortage of appetite for embracing IT," he said. Clinicians talk to colleagues around the country and come back wanting Advocate to acquire technology to better drive clinical outcomes. It's more an issue of cost of operating the new technology. "There's where we have a wonderful conflict in our organization between this desire to embrace new technology and the ability to fund it adequately and operate it appropriately."

Measuring sticks
Mr. Skogsbergh asked how Mr. Mecklenburg would translate the factors of BP, BPE and EFP into measurables.

Mr. Mecklenburg said that it's a continuing learning process and the metrics change all the time. Northwestern does a lot of benchmarking, a difficult task. The important thing is to first start to measure. If you find you're measuring the wrong thing, change it to measure something else.

"When we translate the strategic plan down to individual goals and objectives, we select a few things to measure. It's not necessarily comprehensive. But, you know, one year we'll be taking a look at turnover rates in terms of our best people strategy, the next year we might be looking at vacancy rates. But you've got to pick something and measure it, and then over time" shift the focus to new priorities, said Mr. Mecklenburg.

Advocate's process-improvement activity is an adaptation of Six Sigma techniques, Mr.

Skogsbergh added. "I agree, our benchmarks are getting better. Just having dashboards and benchmarks is a major first step and then you make them better over time."

Sudden expansion v. long-term stability
Kevin Wardell, president and chief administrative officer of Norton Hospital, the flagship hospital of the Norton Health Care System in Louisville, Kentucky, said that in 1998, Norton bought four area Humana hospitals and has since been digesting the acquisition. "This wasn't a nice, non-profit merger, this was an acquisition of a for-profit substantial company that doubled Norton's size in a day. Competing capital priorities have delayed implementing various IT systems."

Kevin Wardell,
President & CAO,
Norton Hospital,
Louisville, Kentucky

But vendors have also failed to deliver the product, and as an industry we've neglected to create a market for the vendors to sell to until recently. We'll now begin to see much more responsive and accountable IT vendors because our attention is focused today in a way it wasn't before.

"Finally, as Gary said, we're learning to put in place the fundamentals, the infrastructure, before moving to more advanced levels. Norton is still heavily involved in the fundamental stage, still getting the kinds of systems in place that will carry us forward into the future," Mr. Wardell said.

Audience Q&A
Ed Septimus, MD, medical director for infectious diseases and occupational health at Memorial Hermann Healthcare System

in Houston, asked Jim Anderson 1) How senior leadership can really embody the mission, not just talk about it; 2) How you create a transparent environment where you can have a diversity of opinion and not just surround yourself with people who are in your own image; and 3) How organizations put the right resources into improving clinical outcomes when they're struggling with operational finance.

Mr. Anderson responded that having a robust strategic planning process is key because it can clarify that an organization's three to five-year expectations, for example, are to undergo transformation, radical change in the way we deliver healthcare. Once it's in the strategic plan and approved by the board, that notion will find its way into the scorecard and incentive compensation of senior executives.

Senior management continually speaks in terms of transformation and radical change, said Mr. Anderson, and that gets easily translated to an emphasis on clinical outcomes. Each of the top 11 senior managers is champion of a pursuing perfection goal or work group.

"So at the end of the year we rack up the numbers and see what the results are, and clearly there are financial implications to doing well or not doing well. It took me a long time to persuade a number of physicians that we really did not want them to do things if they weren't medically required, even though it would reduce revenue for the institution. It was simply not credible until we said it half a dozen times and actually did things that reduced overuse," he said.

No to "yes men"

In terms of avoiding "yes men," Children's gets families engaged with redesigned processes as a stimulus to opening minds and different ways of doing things. "We talk a lot about how we want you to take risks,

we don't want you to be risk-averse, and we'll back you in taking that risk," Mr. Anderson said.

"In terms of the financial implications of this kind of change, we stopped talking about financial reasons to do this. If you start this transformation as a cost-reduction effort to make more money, you lose your constituencies very rapidly," he said. It must be a matter of doing the right thing for the patient, the child: provide the right kind of care, make it evidence-based, use protocols and everything associated with that, and let managers worry about the financial consequences. "What we found is that there are a lot of things you can do that don't cost a lot of money that make things better. We changed to a more scheduled rounding with all caregivers and trainees in the same room at the same time. It didn't really cost us any money. What it did, though, was to indicate everything that needed to be known about the care of the child, when discharge would be expected, all the future planning—and that cut telephone calls by 70%." Mr. Anderson said.

A penny for your compensation thoughts

Brock Nelson, CEO of Regions Hospital, part of HealthPartners in St. Paul, Minn., asked the speakers to quantify the incentive compensation they use.

Mr. Mecklenburg responded that incentives rise as you rise in the organization. The first-line employee can get a $400-$500 annual bonus. When you get up to senior management, it can approach 50% of their compensation.

Mr. Wegmiller noted that balanced scorecards in the industry are gaining ground quickly. There is a rapid growth in the percentage of total compensation that now comes from short and long-term incentive

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plan compensation. Ten years ago, it was maybe 10% of the total compensation package. It's not unusual today to see as much as 50% of total compensation come from incentives, and it's rapidly changing in most leading organizations.

"Market-based vs. System-based Strategy: Patient Data Collaboration for Continuity of Care"

Erica Drazen, VP of emerging practices at First Consulting Group's Boston office, introduced **William Yasnoff, MD**, Senior Adviser, National Health Information Infrastructure, Department of Health and Human Services, Washington, DC.

William Yasnoff, MD, Senior Advisor, DHHS, Washington, DC

Dr. Yasnoff discussed a National Health Information Infrastructure (NHII), whose overall goal is to achieve anytime, anywhere healthcare information and decision support at the point of care. Doing this will require the availability of the complete medical record; up-to-date decision support at the point of care; selective reporting for public health; the use of practice tools such as e-prescribing; and, importantly, patient access to their own information.

"But this project is not about building a national database or government controlled medical records." Dr. Yasnoff said.

A key problem is the need to align the incentives. We need to at least have the option of allowing each care facility to maintain its own data. We also need to minimize costs and risks by using an incremental

"This project is not about building a national database or government controlled medical records."

approach, and try to be sure that the implementation scope coincides with the benefit scope.

If we only had an NHII

"If we had a national health information infrastructure, we would have much better linkage between medical care and public health. Our test results and X-rays would always be available so we would stop doing repeat studies. The complete medical record and decision support would always be available so we would stop asking physicians to have a super-human memory and then to utilize that super-human memory with 100% perfection 100% of the time, clearly not a reasonable expectation," he said.

The Center for Information Technology Leadership at Partners Healthcare estimates that, when fully implemented, NHII will result in savings of over $131 billion annually. Dr. Yasnoff breaks that down into three areas of opportunity and challenge: 1) **In-patient EHRs** that drive savings to the institution. 2) **Outpatient AMRs** that have larger benefits but these benefits go to the payer, and 3) The **business case for physicians**, particularly small practices, is very weak.

Dr. Yasnoff cited a successful program in Maine where Anthem Blue Cross implemented a program that provided $5,000 per physician in upfront incentives for EHRs combined with a pay-for-performance program and assistance in setting up care management activities. "They found all their quality indicators improved dramatically and they're getting a good return on their investment."

Most of the benefits from NHII come from the concept of community health informa-

tion exchange, or the ability to retrieve records on an individual from all the different sources and deliver them to the point of care whenever they're needed. The problem, though, is that the "first organization in the community to invest loses," or, at the very least, has the longest wait for an ROI. So, there's a disincentive to get this process started. As a result, the government recognizes the need for seed funding to get these community networks started. Once they generate the expected savings, they not only should be self-sustaining but should actually generate returns to investors.

It's local, stupid

A local approach to building NHII is the best. "Examples like Indianapolis and Santa Barbara, represented here, prove they can work locally. The local scope increases the probability of success. Also, as the size of an IT project increases, the probability of failure increases exponentially," Dr. Yasnoff noted.

The **key issues in building local health information infrastructures will be buy-in, governance and control, ownership of information, financial arrangements and technology**, which he said is the least difficult. He reminded us that last November's IOM report asserted that NHII should be the highest priority for all healthcare stakeholders.

Like Avis

Rich Umbdenstock, President and CEO of Providence Services, described Inland Northwest Health Services (INHS), Spokane, Wash., a joint venture between the two hospital sponsors in Spokane—Empire Health Services and Providence Health Care. Spokane is the biggest city

between Seattle and Minneapolis, Calgary and the Salt Lake and Denver region. "We have to try harder to attract referrals and to make things work in a large geographic area that I always say has everything but people," he said.

INHS has had successful experience in several collaborative ventures including air ambulance, telehealth and a regional rehab institute. An Information Resource Management collaborative involves 30 hospitals connected on one IT platform in the region, all moving toward a single patient record.

Friendly competitor

In 1996 Providence's direct competitor, the CEO of Empire Health Services, invited them to collaborate on IT to make it easier for referring physicians to track patients in the wider region—and keep referral patients coming to Spokane. "It took vision and it took collaboration," he said.

Rich Umbdenstock, President & CEO, Providence Services, Spokane, WA

IRM connects 30 hospitals, a regional reference lab, the community blood bank, a home health agency and a nursing home, along with many physician offices. The key, says Mr. Umbdenstock, is a single patient record identifier or "master patient index." Medical records for any one of the 2.5 million people hospitalized in Spokane since 1996 reside in a central database accessible to participating sites. "The best way to describe INHS is as the trusted data party in the region, all of the

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When physicians enter a facility they pick up a list of all of their patients in any of the participating hospitals, not just that particular hospital, and select whatever data sets they want. On the way out they simply download and move on.

security concerns and so on are centralized in one entity."

Physicians in Spokane now want an interchange or cross-walk between their office record numbers and the hospital numbers so they can combine patient information. That requires standardization of data and nomenclature. "But since we already have a single inpatient IT system, it reduces this challenge, plus the entire network gets better and cheaper with each new installation," he said.

Wired physicians are beginning to use wireless handheld personal data devices synched to infrared capability. When physicians enter a facility they pick up a list of all of their patients in any of the participating hospitals, not just that particular hospital, and select whatever data sets they want. On the way out they simply download and move on. The first 30 doctors who tried this—it quickly climbed to 400—estimated the handheld was saving them 30 minutes a day on rounds. "If you can give any doctor or staff member time back in their day, it's better than almost another vacation day or some other perk," said Mr. Umbdenstock.

Linking public health with acute care

The organizational partners can now build clinical safety systems around this foundation. Five-hundred-bed Sacred Heart Medical Center, for example, is completely wired for bar coding at the bedside. Also, "We have installed the Center for Disease Control algorithms; we're the only non-governmental entity to have installed those," said Mr. Umbdenstock.

"Regarding the linkage between public health and acute care that Bill [Yasnoff] mentioned, we can now look at what is happening in ER's across a wide area, so if something should break out, we will know it," he said.

System features also include clinical documentation for nursing and clinical imaging. Mr. Umbdenstock described a graph that showed that the number of physician hits on the system outnumbered the office-staff hits when the clinical documentation application was implemented. That gap will grow as more physicians adopt handheld devices, he predicted.

The telehealth system involves 50 sites in the region. It enables medical specialists to view the referring physician and patient—and through the IT system, the patient's record—remotely. "So we have ER consultations, radiology consultations, mental health consultations, and we support hospital pharmacies in towns that don't have a pharmacist. The prescription can be faxed or scanned and our pharmacist can oversee the administration of that drug."

Mr. Umbdenstock summarized lessons learned. "It's all about vision for a market-driven solution." His advice: **standardization over brand is key; avoid best of breed; integration over interface; scalability over customization**. "I agree with the point that it doesn't make a difference what vendor it is. My deep analysis is that really good telephone systems are a huge convenience, but only if they ring outside your building. This is no different."

If you build it…

Siew Lam, MD, CMIO at Indianapolis-based Clarian Health, gave an overview of the community electronic medical record in Indianapolis known as **INPC, for Indianapolis Network for Patient Care**. INPC, launched in 1993, covers

about 1.3 million people in the metro-Indianapolis area and is a collaborative effort of the five-largest hospital systems, providing 95% of the care; it involves 14 facilities. The EMR collects 90% of lab results from these facilities, 46.5 million records a year. It covers 95% of inpatient medications, or 48.2 million records a year, as well as 98% of the chief complaints from these facilities. It amounts to 22.5 million "accesses" per month, primarily information sharing among ER departments across the five healthcare systems, translating to 450,000 ER visits a year.

INPC reflects the "if you build it they will come" approach, and was created in 1993 with help from the Regenstrief Institute and it has recruited providers to join. Similar to Spokane, however, an independent governing entity oversees the network.

A repository among five health care systems that uses every major clinical information system vendor presents a real challenge in mapping and standardization.

Dr. Liew said the **market-directed strategy** described by Mr. Umbdenstcok in Spokane **is likely to succeed faster** because there's better buy-in from partners from the beginning and it's easier to determine the features and functionality you need.

Just sign anywhere
INPC has many valuable features, such as "Docs for Docs" which delivers transcribed daily reports to 800 physicians, which they sign electronically and return to the repository.

"We truly need to focus on delivering value to physicians to help them optimize their office practice. We didn't want to burden the physician with determining where to look for the information, whether it's from one healthcare facility versus another healthcare facility," said Dr. Lam.

Cottage industry
Alberto Kywi, CIO at Cottage Health System in Santa Barbara, Calif., discussed the **Care Data Exchange (CDE)** initiative, which will provide diagnostic information to the medical community from county-wide healthcare providers. Santa Barbara County is sparsely populated compared to other areas in California, with a 500,000 population concentrated in three major metropolitan areas all along the coast. There are only two or three hospital systems that provide inpatient care. CDE operates within a loose affiliation of these providers and is funded by the California Health Care Foundation. It will go live during this summer.

Lack of a common IT denominator has been a challenge: provider organizations lacked the same systems, and did not have the same level of sophistication. CDE works with each provider to extract information from their systems and put it in a technology neutral location.

Another requirement is a community-wide patient index: CDE holds the demographic information and creates an algorithm to compare the various basic indicators for each patient to create a match.

Resolving data ownership issues was a major challenge. The compromise was that each provider would retain its data but make it available to CDE, which tells you where the information was about that patient and you "go there" electronically.

Resolving data ownership issues was a major challenge. The compromise was that each provider would retain its data but make it available to CDE.

The biggest challenge is funding, because the ones who benefit the most are physicians, and they don't want to pay. They presume they're going to get this information—the lab results, reports, etc.—eventually anyway.

From the ground up

To protect these data-ownership concerns, CDE opted to build the solution from scratch, rather than buy a centralized system. They hired Care Science Systems, which has since been acquired by Quovadx, Inc., Englewood, Colo.

Mr. Kywi said the biggest challenge is funding, because the ones who benefit the most are physicians, and they don't want to pay. They presume they're going to get this information—the lab results, reports, etc.—eventually anyway.

Hospitals also see their financial resources scarce and shrinking, and some already have their own physician portals. So far it's been funded by grants, so long-term success depends on how much value the users of the system—physicians—see in this.

New village green

John Glaser, PhD, CIO at Partners HealthCare System in Boston, talked about two initiatives: 1) **the New England Health Care EDI Network** and 2) **Mass Share.**

John Glaser, CIO,
Partners HealthCare
System, Boston

In fall 1996 CIOs from three providers and two payers came together and decided to create an insurance EDI infrastructure to move eligibility queries, claims, etc., and agreed it should be collaboratively managed. "There's a clear ROI eliminating paper and fax. **Key factors for success: One is for everybody at the table to benefit; Second, for me to get my gain, I need you. Third, for me to get my gain, I need more than you, I need scale." If I'm the provider, I need all the payers. If I'm the payer, I need as many providers as I can get. Lastly, claims processing is not a strategic competitive advantage for anyone; we should all just do it as efficiently as possible.**

Today there are 24 member organizations. Partners does 1.2 million transactions a month over the network and pays only $70,000 a year. "If you pay 25 cents a transaction, even if you potentially did one transaction per outpatient visit with each of the four million outpatients we have, the difference between a million dollars and $70,000 is not lost on anybody in terms of the pure economic gain," said Mr. Glaser.

Ready to go clinical

Mass Share was created a year ago when Glaser and the CIOs at Blue Cross/Blue Shield and the Massachusetts Health Data Consortium got together and said, we're succeeding on the insurance side, so now it's time to explore clinical interchange.

The challenge is totally different, and the governance structure had to change from just CIOs. It now includes the CEO of Tufts Health Plan, the president of Emerson Hospital, the secretary of economic affairs for the State of Massachusetts and the president of the Mass Medical Society, among others. Also, there's no single class of initiatives like insurance EDI. There are some clinical initiatives for which there is clear utility and others which require more experimentation and demonstration before we even know the value.

One initiative that's clearly valuable and will be ready at end of summer is an e-prescribing infrastructure which creates an electronic prescription; checks the PBM for eligibility and copay; returns to the

formulary should there be a suggested therapeutic shift; shows medication history, and, determines other drug allergy or drug interaction, or possible compliance issues. Once you've "cleaned" the transaction for insurance and clinical purposes, you move it to the dispensing area of choice, whether it's the mail-order PBM or retail pharmacy.

Growing a clinical business

There are significant incentives to do this, said Mr. Glaser. "One, we're under very significant managed care contractual obligations to drop the cost of drugs. On the other hand, we're working hard to get 17% compounded annual growth, so we have very, very significant incentives to keep people on formula. We also have significant incentives to cut outpatient adverse events further. For every 1,000 people who walk into our outpatient clinics, we admit 3.4 because of an ADE."

Therefore Mass Share is using the same shared services model; and Partners will have a prescription fee of approximately $50,000 per year.

Because the notion of a repository or master patient index with 8 million people is touchy, the organization is creating an ability to identify and retrieve results that doesn't require an MPI or a CDR. By eliminating this technology middleman, it could streamline the structure and drop the cost. "If we get the costs down, a lot of people might join just to learn and to begin to experiment with it," said Mr. Glaser. The next 12 months will involve prototyping and piloting.

Q&A

In response to a question from the audience about legal obstacles, Dr. Yasnoff stated emphatically that there are no legal obstacles to collaborating for the use of information. Such fears, he said, arise from overzealous legal counsels.

Regarding political obstacles to adopting a single unique patient identifier, Dr. Yasnoff said that he thinks the best way is to start with voluntary identifier programs. As these are used, people will be convinced that they can move through the care system much more conveniently and efficiently.

Mr. Glaser noted that there are many initiatives that do not require a unique patient identifier such as e-prescribing that can be addressed now. "There are more pressing issues, such as how you govern these things, what causes sustainable business models, dealing with issues of standardization, managing privacy and a bunch of other hurdles to get through, before we tackle the UPI," he said.

"Future Medical and Information Technologies that will Disrupt our Business"
Molly Joel Coye, MD, Founder and CEO, The Health Technology Center, San Francisco

Stanley Hupfeld, President and CEO of Integris Health in Oklahoma City, introduced Dr. Coye, who discussed disruptive technologies in healthcare, citing the example of the Roomba, which is "tearing up the vacuum cleaner industry," costs $280 and automatically vacuums carpets and floors. "It is a typical example of what Clayton M. Christiansen wrote about in *The Innovator's Dilemma* talking about disruptive technologies that come in as easier, simpler ways of doing relatively narrow tasks," Dr. Coye said. Large, longstanding, reasonably successful but very ponderous and slow-moving institutions do not have

There are many initiatives that do not require a unique patient identifier such as e-prescribing that can be addressed now.

The greatest force driving technology disruption is external: the recognition that a third of healthcare expenditure is waste and could be eliminated if we adopted correct technology and change reimbursement appropriately.

a chance against the disruptive technologies, according to this author. Christiansen's second book, *The Innovator's Solution,* explores how those institutions can in fact incorporate disruptive technologies and make them work.

The Athontug, a service robot, is a similar example in healthcare. It replaces three FTE's on average. "So in terms of labor relations and a lot of other aspects, it's a very disruptive technology," she said.

Molly Joel Coye, MD, CEO, The Health Technology Center, San Francisco

Dr. Coye said that the most precious resources executives must consider when investing in new technologies are not so much capital for acquisition but much more for the ongoing operational pressures, change management and innovation in processes "that really kill you when you try to adopt a new technology."

Inviting disruption

The greatest force driving technology disruption is external: the recognition that a third of healthcare expenditure is waste and could be eliminated if we adopted correct technology and change reimbursement appropriately.

The federal government has concluded that the net ROI in clinical technology is positive in almost every area; the job of policy in Washington should be to speed adoption. **We can never achieve the kind of national health information infrastructure the IOM called for without massive federal investment**, for which there is growing support in Congress, she said.

I'll manage at home

Dr. Coye discussed remote patient management of chronic disease to illustrate how investment in new technology can improve quality and efficiency. Many of these technologies are on the market today but are not widely adopted, but will likely be disruptive in the next five years.

A patient with congestive heart failure can manage her condition at home using such devices and significantly improve care. That's partly because a high proportion of CHF patients develop diuretic resistance over time and about 45% of discharges are back in the ICU with serious resistance to diuretics. Remote patient management can eliminate those emergencies.

Another example is an FDA-approved cart that does hemofiltration, dramatically cutting ICU stays. By using this device many patients can be discharged directly from the ED to the outpatient setting.

Dr. Coye asserts that many of the things that improve quality actually wind up being beneficial economically.

Other technologies that will disrupt the care for CHF include the Elbad and the e-ICU. Her point was that for CHF alone there are four key technologies currently on the market that are profoundly disruptive, in a positive way, of current patterns of care.

My hero

Another example: Health Hero. Peer-reviewed articles show that this is a very effective tool for remote management of

uninsured, high-risk diabetics, in children with asthma in a very poor, multi-ethnic community, and among veterans with multiple chronic diseases. Dr. Coye asked why such technology would not be widely adopted over the next two or three years.

The business case does not mean there must necessarily be a financial ROI. It may simply be an improvement in quality or greatly help retain nurses in the ICU. She does agree, however, that **there is no such thing as being an early adopter: early adopters really are beta sites, because every technology is painful and complex the first time you adopt it. "Innovation in most of healthcare is still an unnatural act."**

Dr. Coye relates the story of how ships historically lost half their crew to scurvy. In 1601 Captain James Lancaster first proved that citrus prevents scurvy but it still took almost 250 years for the British Navy to officially adopt lemons as a prevention.

Similarly, **it takes the U.S. health system 17 years to embrace beneficial innovations**. The Health Tech tries to accelerate this by unbiased encouragement of beneficial technology. She asks rhetorically, "What were the reasons not to take lemons along on the ship? And that's the question for the CEO's here, what are the reasons not to adopt some of this technology?"

It costs more to operate

Understanding the cost structure of adopting new technologies is often hampered by lack of knowledge of operating costs—and every new technology, clinical or IT, has a tremendous operating-cost ripple effect: we need to understand from beta sites what those cost structures are.

"We have also worked with our members on facility planning, because most of the industry is still building hospitals that are just perfect for 1990. When we started our research, we asked a lot of the leading architecture firms in the country where they get their information about new technologies, and they said, "We ask our clients." We asked the hospital systems where they get their information, and they said, "We ask the architect." So we have a perfect vicious circle as opposed to a virtuous circle, of lack of knowledge," said Dr. Coye. The center has spent a lot of time examining the pace of introduction, probable rates of introduction and dissemination of different technologies and has developed for each service line a timeline of different technologies and their potential impacts.

It has uncovered a range of problems. One is that in many cases the IT staff are not involved in facility planning at all, or until late in the process. Second, we're going to have new burdens when patients with implanted devices show up. The ER will need to have to distinguish between a device malfunction and the patient's actual illness.

In terms of security, lack of a single sign-on for systems is a problem, so the center is tracking experimentation with RFID (radio frequency identification) and voice against fingerprint. Health Tech is also studying technology to better save data during computer crashes. They're also looking into "fishing" in which fraudulent entities email customers with links, the customer logs on, a pop-up window asks them to enter information, and the fraudulent entity harvests the information. "What that means is that if you have a portal, that

Most of the industry is still building hospitals that are just perfect for 1990.

information could be harvested from physicians or from patients, and this is something that in healthcare, at least, we're just starting to recognize is a problem," said Dr. Coye.

Panelists respond

David L. Bernd, CEO of Sentara Healthcare, in Norfolk, Va., and Chairman of the American Hospital Association, said that healthcare's low rate of adoption of breakthrough technologies can be demoralizing. He asked why it is that the e-ICU, which has proved it can cut mortality rates, has been adopted by only eight institutions after being available for more than three years.

David L. Bernd, CEO, Sentara Healthcare, Norfolk, Va

"I cannot think of a significant clinical quality system we put in Sentara over the last seven and a half years that has not had a positive payback for our bottom line," Mr. Bernd declared, adding, "Continuous quality improvement and clinical process improvement is also good for the business side of our industry."

Sentara splits capital dollars into maintenance and strategic budgets. Each year departments vie in a lively competition for the strategic capital, generating breakthrough ideas and strategies for the organization. "It is really fun. All the capital is up for grabs," and it forces people to develop alliances to push their ideas forward.

"I don't think the problem is lack of ideas, I don't think the problem is picking out the right technologies. It is having the internal discipline to push our organizations in the right way," he argued.

All in the execution

Van Johnson, President and CEO of Sutter Health, in Sacramento, reiterated that **success with technology "is all in the execution."** He said he became a believer in the e-ICU when he visited Sentara and witnessed firsthand how an ICU physician was able to use the system to save a patient who had gone into convulsions from a contraindicated medication.

Van Johnson, President & CEO, Sutter Health, Sacramento
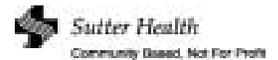
Sutter's experience is an example of how even a leading organization with executive support for a proven technology must still overcome inertia to adopt new technology. It took the CMO and a team six months to go view the e-ICU at Sentara, and another six months for the organization to begin to debate the business plan. "It wasn't a business plan issue, it was a safety issue, fundamentally, pure and simple, a market differentiator as far as I was concerned, something that should be done, and the technology was there," Mr. Johnson said.

Sutter's adoption of bar code technology to help prevent medication errors was even faster. When Johnson became aware of the technology's benefit he invited Bridge Medical, Solana Beach, Calif., to make a presentation to Sutter's CIO, CFO and the most exacting nurse in the system.

Mr. Johnson recalled, "I said, if you can convince them that this makes sense, then we'll go. Within 30 minutes the nurse direc-

He asked why it is that the e-ICU, which has proved it can cut mortality rates, has been adopted by only eight institutions after being available for more than three years.

tor was saying this is the best I've ever seen for anybody in nursing in years. And it's the right thing to do. So we bypassed all of the CEOs and CFOs and went directly to the 31 chief nurse officers, and said, what do you think? And their answer was, 'This is the best we have seen for nursing in years. Why can't we do it?' And I said, well, what do you think, should we develop this as a standard? They said not only a standard, but mandatory. I said, who's going to be the pilot project in this thing? All 31 raised their hand and said we'll do it."

Pharmacy wall

The biggest barrier was pharmacy because of an inability to unit-dose bar code. However, Sutter solved that problem with the help of a distributor partner. "We now have eight of our hospitals that are wall-to-wall implemented, and we've already given over one million medication administrations. [After implementation] We found 15,000 errors that were preventable, and of those, 1,000 could have been disastrous. Now you tell me that that isn't a business case; we're rolling through the organization as rapidly as we can," he said. Sutter started with smaller community hospitals to make sure it worked and now is rolling it out to bigger, more complex facilities.

"I think why we're so slow to adopt new technology that works is because we get so caught up in our processes, politics, and money, that we don't just implement," said Mr. Johnson. However, he maintained that Sutter was able to differentiate itself with aggressive payers like CALPERS by investing in technologies like e-ICU and bar coding.

Memphis two-step

Gary Shorb, CEO of Methodist Healthcare in Memphis, Tenn., talked about how two individuals have helped shape Methodist's approach to technology: Jim Collins, author of the book *Good to Great*, and Bob Waller, MD, former CEO and chairman of the Mayo Clinic, who now lives in Memphis.

After consulting with Collins and Waller, Methodist chose to invest $80+ million over four years on its enterprise-wide clinical IT system. Collins assessment: the healthcare industry is so complex, so driven by third parties, so fragmented and so resistant to standardization that "Success is really all about the 'who', about the people. That's particularly important when it comes to technology deployment," said Mr. Shorb.

Dr. Waller and Mr. Shorb helped Methodist understand that the community-wide, collaborative approach is the right approach. **His mantra: collaborate on the science, collaborate on the evidence, and compete on the execution.**

FedEx'ing a solution

Gary Shorb, CEO of Methodist Healthcare, Memphis, Tenn.

Mr. Shorb made **two points about technology adoption: First, We can learn a great deal from other industries.** In Memphis, Methodist is studying Federal Express, one of the most advanced users of IT, partnering with them in a FedEx Institute of Technology with the University of Memphis. Nanotechnology and RFID, for example, may have many applications in healthcare. **Second, the key to successful adoption lies is in medical staff leadership.** Having a chief medical information officer really helps bring the rest of the medical staff along. "It's absolutely one of the most critical things we can do to impact our execution," said Mr. Shorb.

The healthcare industry is so complex, so driven by third parties, so fragmented and so resistant to standardization that "Success is really all about the 'who', about the people.

When physicians know they can access medical records from home, they will do prep work before they get to the hospital.

Breakfast Executive Roundtables
Session Leader: Ralph Wakerly, Principal, Wakerly Partners, Chicago

Conference attendees registered for one of seven roundtable discussions, which were then summarized for the assembly.

Roundtable 1: Technology Adoption

Jim Jones, VP, Hewlett-Packard, Palo Alto, Calif., represented this roundtable and said the group's general consensus on implementing technology was that it's necessary to start with a vision and reinforce that vision in everything you do; it must come from top management and trickle down to each individual.

Surprises along the way include the lesson that IT cannot carry the whole burden. Once an IT initiative moved into the operational environment, things progress because adoption accelerates. The adoption rate won't take off till they shut off the parallel line. One approach is to eliminate access to paper by preloading pharmacy or lab information in the system and nudging physicians and staff to find it. Another helpful approach is to design fixed and mobile devices so that once logged in, you stay logged in as long as you're working with a patient.

Another idea: When physicians know they can access medical records from home, they will do prep work before they get to the hospital. Once they arrive, they begin their rounding schedules with aggregated data and can reduce time onsite by 30 to 60 minutes.

Regarding IT support, some organizations provide "hidden pods" for users to visit to get help; others create support centers that are openly located in the cafeteria, visible to even patients and families. Signs and banners told everyone that the environment was improving and reinforced the transition with physicians and staff. Constant exposure reinforced the sense that change was in the air.

Incentives were used in several organizations to encourage people to do tasks online, such as online surveys with the possibility of winning a PDA, free carwashes. There are a variety of fun activities to get people to anticipate using the system.

An important adoption issue: in rollout, the infrastructure greatly expands and the transaction mode, uptime and supportability issues get more critical.

Roundtable 2: Process Improvement

Eric Morgan, EVP Healthcare, Lawson Software, St. Paul, Minn., reported that the discussion centered around clinical process improvement. The group addressed such questions as: Who owns strategic process improvement? What's the governance model? Who is accountable for process improvement results? What specific methodologies or standards should be used? Should these be used throughout your enterprise or is it done on an ad hoc basis? The role of IT in clinical processes is key, everyone agreed.

One idea was to put in place a scorecard on clinical reporting across the enterprise. This should be a combination of outcomes-based metrics and process-based metrics. A variety of techniques are being used, but there is no single methodology accepted in healthcare.

One of the most important factors: leadership commitment from the CEO and tying compensation to results. One organization has a department that acts as a centralized agency with authority for reporting all such measurements.

Many organizations develop a short list of a dozen areas of measurement to focus on, and as they achieve levels of improvement, bring in new metrics, reviewing the list quarterly.

One interesting realization: while IT supported much improvement, many processes could be improved on their own. However, the group agreed that to achieve Six Sigma level, IT is absolutely critical.

Cultural and process issues and managing people through the change process were key points of discussion. One of the concerns was disclosure, because reporting outcomes and metrics involves a certain amount of information transparency. Do all employees get access to this information? Can I see what's going on in other hospitals? The general consensus was that the more transparency the better and, while you may get pushback from risk-management staff and others, transparency was the only way to go.

Roundtable 3: Performance Measurement and Improvement

Brian Jon Anderson, MD, CMO, Allina Hospitals and Clinics, Minneapolis, reported that this Roundtable group debated whether it's possible to actually create measurement constructs that reflect the value of IT investment. Secondly, they discussed the possibility of creating an SI collaborative that would allow the sharing of practice and knowledge around such measurement systems.

Finance executives asserted that any good finance person could link clinical outcome satisfaction and safety to a dollar value. No one argued that point. The other unspoken assumption was that valid and timely measurement is the foundation of the organizational improvement.

The group felt that in any measurement system it's extremely difficult, if not dangerous, to conclude a direct cause and effect, a one-to-one relationship between IT intervention and outcome at the enterprise level. Therefore, that should not be the primary focus of the measurement tool.

IT investment is clearly an enabler, not the end goal itself. Obviously, it then becomes an indirect contributor. And a metric tool doesn't sell well with the workforce if the selling point is totally financial as a justification for the IT investment. It just doesn't grab the hearts and minds of the nurses at the bedside.

Another point: The metrics used for IT investment should reflect and be directly and continuously related to your organization's strategy, mission and tactics. That point must be pounded home daily. If you can't make that clear connection between those metrics and your organization's mission, strategy and tactics, then it's likely a wasted effort.

The group concluded that the metric system should cross several domains, including patient and workforce satisfaction, and financial results, to reflect the underlying value of the enabling investment, but you should ensure that its leading indicator is clinical.

A key to success is to ensure that any metric framework to measure values and invest-

Many organizations develop a short list of a dozen areas of measurement to focus on, and as they achieve levels of improvement, bring in new metrics, reviewing the list quarterly.

Local sources of evidence are seen as critical, particularly the results of root-cause analyses and other performance improvement and risk management activities.

ments should utilize and leverage existing measurement resources.

The group agreed there would be value in creating a Scottsdale Institute forum in which organizations could share their learning and best practices around measurement systems. More information on this project will be forthcoming as a result.

Roundtable 4: Knowledge and Learning Management

Jim Walker, MD, Chief Medical Information Officer, Geisinger Health System, Danville, Pa., said that this Roundtable group began by defining knowledge management as identification and implementation of best practices. There was consensus that communication in many channels is critical to disseminating best practices—but is also insufficient, in that clinical decision support is the most effective implementation method but that it is extremely resource expensive.

Jim Walker, MD, CMIO, Geisinger Health System, Danville, Pa.

The emphasis for these organizations was on putting in basic foundation components such as a clinical data repository, networked feeder systems, physician order entry and nurse order entry and documentation. All are required to convert knowledge bases into action.

One important way to address physician skepticism about knowledge management, particularly in clinical decision support, was to start with high-impact issues such as high morbidity, high mortality and best-

evidenced interventions. "There are enough of those to gives us plenty of work to do for the next several years, and if we do that well, by that point, physicians and other EHR users will have come to the point that they actually rely on the EHR to provide them reminders of best practices," Dr. Walker noted.

The challenge of keeping knowledge fresh is a deeper and less immediately solvable problem. Thousands of clinical rules will be required to achieve excellence and all those rules need to be based on good, transparent and accountable evidence. They also need to be kept up to date, which is a mammoth task. As far as the group knew, no one in the country has a methodology for doing this that's even adequate, let alone efficient. As a result, there's a need to have high-quality sources of nationally or internationally validated evidence with local adaptations and mechanisms for keeping those local adaptations in synch as the national and international best evidence changes.

Local sources of evidence are seen as critical, particularly the results of root-cause analyses and other performance improvement and risk management activities. These should be factored into knowledge management, but obviously work in conjunction with the best evidence information.

In terms of learning-management systems, it's a critical organizational need to provide cost-efficient and time-efficient education to a varied workforce. It was agreed that in most cases there was no system-level responsibility for learning management, which is sub-optimal.

At Geisinger the CMIO has responsibility for technology education and manages the

learning-management system for technology. The department builds curricula, reminds users what parts of their role-defined curricula are coming due soon, and reports those who are not up to date on their learning.

Roundtable 5: Supply Chain

Dan Eckert, president and COO of Neoforma, San Jose, Calif., said his Roundtable group's first question was whether supply-chain related issues are becoming a bigger priority within healthcare organizations, and the answer was yes, in many cases, but not high enough in most cases. The focus on supply chain needs to intensify given the success it's had in other industries, and given the fact that supply-chain costs represent the second-highest operating expense in most healthcare institutions next to personnel. Also, traditionally there's been a less-than-aggressive investment in technologies on the supply-chain side and in favor of clinical initiatives. And, while clinical care is the primary focus and core competency of healthcare organizations, reducing supply-chain cost can contribute to providing capital and other things to improve care.

St. Louis-based Ascension Health has made supply chain a top priority for the last three years. It's been included in their strategic plan as a key strategic imperative, involving specific cost-reduction goals. Ascension chose to move quickly by using a web-based ordering, receiving and invoicing system which overlays a number of legacy systems: 70+ hospitals using different systems.

Ascension has successfully addressed Phase One, the fundamentals of supply chain (ordering, receiving and payment processes), and is building a clean global data catalog for their organization. Phase Two will work to further integrate, standardize and upgrade their systems. The first layer drove some of initial savings, so now they can invest to achieve higher-level savings through greater contract compliance and negotiating better contracts at the national, regional and local level—as well as improving clinical services from the supply side

The second question: How are you documenting the value of supply chain initiatives and investment in technology? The general consensus was that no one is doing that well today, but it's improving, and it must be a process implemented from the beginning with a solid baseline so that savings are tracked across processes and through product cost reductions.

Wilma Newton, VP of IT at Ascension, noted that the organization has achieved its supply-chain cost savings goal in two years instead of the planned four. They've also been able to maintain flat staffing levels despite growing and improving services.

It was noted during a recent Scottsdale Institute conference call that 31 VHA and UHC hospitals documented $13 million in savings in supply chain, nine of those organizations recovered over $500,000 and 22 of them over $100,000. At the high end: $2.6 million in savings through implementing web-based solutions and driving improved contracting, etc.

A third question: How are you driving contract compliance? Again, the answer was not that well generally, but it's improving. Ascension and other organizations are doing a better job of capturing supply consumption information on the front end

The focus on supply chain needs to intensify given the success it's had in other industries, and given the fact that supply-chain costs represent the second-highest operating expense in most healthcare institutions next to personnel.

and then using that information to involve clinicians in driving standardization to reduce cost.

Another hurdle is that most GPOs still provide a lot of contract update information manually. However, it was agreed that GPOs are evolving to better meet the needs of their members as hospitals and IDNs much more aggressively drive GPO agendas. And more clinicians are getting involved on the front end to drive compliance to and contracting for products that facilitate improved clinical outcomes.

Roundtable 6: Ambulatory Integration

Mitch Morris, MD, VP at First Consulting Group, said the Roundtable group began by trying to define ambulatory integration: bringing together clinical information and workflow processes across inpatient and ambulatory settings.

Market drivers include the need to help community physicians become part of the hospital, and bring in their patients by creating a path of least resistance. Integration also expands the reach of the institution via information rather than by bricks and mortar. Of course, the need to share information between primary care and specialties over the continuum of care is another driver. Finally, there's an opportunity to save costs with fewer IT systems rather than trying to maintain many.

To achieve this integration, organizations emphasize coordination and quality of patient care, eliminating duplication of effort and patient safety. This also helps in recruiting physicians; they are increasingly attracted to organizations that offer ease of use and access to clinical information.

Can anybody actually integrate the clinical information from ambulatory environments and the hospital? A single proven, cross-continuum functionality does not exist in its entirety yet, it seems. Additional gaps exist for specialty inpatient systems, some of which are medical-device driven, and ambulatory specialty systems. Also, it was noted that integration, while expensive, is possible.

Another important issue was data relevancy: All the rich data from the inpatient state is not all relevant later in the ambulatory environment, and vice versa. How do you filter that both ways so you're not overwhelmed with information? The consensus was that commercial systems don't do that very well and, while a single vendor is preferred over best of breed, most vendors can't do it all yet.

One of the big challenges to implementing a system that integrates ambulatory information is determining who's going to pay for it. Most medical practices don't want to pay for linking into a hospital-based system, even if there are practical benefits. There's another question as to who owns the data, which concerns practitioners. Physicians in the community are also afraid the new systems are going to increase their workload. "You have to sell them. It's difficult to sell even if you have 85% of the functionality."

The overall consensus was that the need for ambulatory integration is something that is coming. Many practices and organizations are already struggling with this issue, but there's no clear cut answer, and this discussion raised more challenges than it provided solutions. "We still have a long way to go to integrate information from the hospital and ambulatory practices into

One of the big challenges to implementing a system that integrates ambulatory information is determining who's going to pay for it.

one whole pie, and it's something we need to do."

Roundtable 7: Patient Flow and Capacity Management

Dale Stockamp, President, Stockamp & Associates, Lake Oswego, Ore., noted that patient flow and capacity management present an enormous issue that is costly to healthcare organizations worldwide.

It's costly in terms of patient satisfaction, as patients are frustrated with delays along the way. It's also costly for employee and physician morale and satisfaction, and is certainly an enormous financial cost to organizations, not only in terms of lost revenue, but also in terms of the need to effectively increase capacity. In addition, an inefficient organization faces opportunity and capital costs to build new infrastructure.

There's a lack of understanding of the complexity and scale of the problem, which involves funneling and managing thousands of patients through a very complex process of care all year long, with myriad people, handoffs and processes along the way. It's a very, very complex issue that cries out for a process orientation. Organizations have traditionally taken a silo approach, focusing on discrete functional areas like admitting or discharge planning. Or, the focus has been on components of the solution such as a new bed board or a new piece of software. We need to address the whole process.

Some people may not understand the true cost of the delays and diverts that mar patient flow process, and incentives are not aligned to improve it. A nursing station might have capacity to take on another patient or two, for example, but there's no incentive to increase the workload.

Several points of solution emerged from the experiences at Ascension, McClaren and Lucile Packard. One way to motivate and get all constituencies on the same page is to quantify the costs of these capacity limitations and patient-flow issues. People respond to that, especially physicians.

The group further suggested that a solution must be comprehensive, addressing all areas from discharge planning to care coordination to the nursing stations everywhere along the way. It must also include a retooling process, equipping each step along the way with better tools and data management. The focus must be holistic process-redesign. And it should incorporate training people to a new way of doing business.

The other success factor is to assign more senior hospital leadership to the issue. Gaining physician support through good science and data is critical; physician sponsors are also key. You can only be accountable for improvement if you can accurately measure, so more detailed measures are needed. It's necessary to measure delays at the hundreds of locations in the patient flow. A good test: Ask your people if they know at five o'clock this afternoon who's going to be discharged tomorrow. Organizations can accurately predict only about 20% of these patients.

In the Roundtable group, one organization had succeeded in cutting average length of stay to about 4.5 days from 5.1, and cutting divert status to three hours from a hundred hours a month. Another achieved a $5 million to $15 million benefit just by redoing bed-board planning. A third increased their capacity by 7% to 8%, hundreds of more patient admissions per year. Redesigning this process can increase annual net revenue 2% to 3%. Patient and

A good test: Ask your people if they know at five o'clock this afternoon who's going to be discharged tomorrow. Organizations can accurately predict only about 20% of these patients.

When errors do occur in aviation, a full public write-up is published on the Internet because the NTSB investigates every crash and does a root-cause analysis.

physician satisfaction indicators can jump. While it's an enormous and complex issue to tackle, there are vast potential benefits.

### Getting to Yes for Electronic Health Record Systems: A National Imperative
Paul Tang, MD, CMIO, Palo Alto Medical Foundation/Sutter Health, Palo Alto, Calif., and Chair, IOM Patient Safety Data Standards Committee

Session Leader **David Classen, MD**, VP, First Consulting Group, and IOM Representative, said the **Institute of Medicine's most recent report, *Patient Safety: Achieving a New Standard of Care,* outlines the future for patient safety and quality from a technology perspective.**

The report raised two issues for this discussion: 1)In order to create a safe healthcare system, we need to support it with technology, specifically adoption of the electronic health record; 2) We need to create a national health information infrastructure. Without this fundamental infrastructure, it's very hard to provide safe care, especially across the continuum of care.

Palo Alto Medical Foundation
A Sutter Health Affiliate
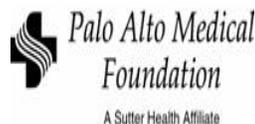
Dr. Tang began by noting that the issue of patient safety has driven the topic of the EHR to the highest national level, including being mentioned in the president's state of the union speech,

Paul Tang, MD, CMIO, Palo Alto Medical Foundation/Sutter Health, Palo Alto, Calif.

and since this session, the president's challenge to the industry of having EHRs in place nationally in 10 years, and his appointment of the new healthcare IT czar, Dr. David Brailer.

Dr. Tang asked rhetorically why we have a patient safety problem. Much of it is cultural. Just as we do in aviation, we will have to learn to trust that somewhere, somehow, somebody's figured out the incredible information infrastructure to keep us safe. We need computers to do that.

On the horizon
As part of their IT infrastructure, air traffic controllers have decision-support tools that alert them when there is congestion or other problems. "Use your judgment and get us out of this," the system says.

Aviation safety relies on an incredible teamwork between the pilot, the copilot, the machines they fly around in and the infrastructure that supports it all. There's a pilot's information system designed for two pilots, both equally able to fly the plane. They both have similar access to information presented in an intuitive way, as in the graphical artificial horizon. "They have tons of calculations going on, but they're presenting it in a way that humans can assimilate it and make judgments and make decisions, mostly the right decisions," said Dr. Tang.

In contrast, healthcare throws 50 numbers at a human being, who's expected to figure out the trend, how to assimilate it—and do so without the equivalent of an artificial horizon. "There's only a cacophony of what might be called data, very little information," he said.

When errors do occur in aviation, a full public write-up is published on the Internet

because the NTSB investigates every crash and does a root-cause analysis. The NTSB has no enforcement powers but can make public their judgments and the steps needed to prevent the crash from reoccurring. Aviation has discovered the power of transparency.

The complementary voluntary side, the Aviation Safety Reporting System, allows everybody involved in aviation to report an incident or a near miss with the assurance that, even though they identify themselves and there's a follow-up investigation, everything will be scrubbed of any identity. So there's limited immunity. No enforcement action is taken against you as long as you make the report within 10 days, which encourages people to report incidents when fresh in their minds.

The result: almost immediate feedback back to the reporter on what's been done. The number of reports has grown—not because of more incidents, but because the culture has changed. They have over 36,000 reports annually, and a database of about 500,000 of these reports from which to learn and continuously improve aviation safety.

Paper redundancy

In contrast, healthcare's information infrastructure is a huge mountain of paper medical records that is drowning our caregivers. "What's the analogy to the control tower where they're making minute-to-minute decisions, getting information?" asks Dr. Tang. "We have to forage wherever to get data that's needed to make decisions on patient care."

He described the consequence of not having information that we demand of our banks and of the airlines: One of the studies upon which the IOM study was based looked at 30,000 charts and, while conservatively defining an adverse event, found that 3.7% of the hospitalizations had ADEs, 14 of which were fatal. Thus the now-famous 98,000 annual deaths in the country, more than half of which were preventable and due to medical error.

Most errors that we measure are errors of commission, such as cutting off the wrong leg or giving the wrong antibiotic. However, a likely bigger issue is errors of omission, such as neglecting to give a patient beta blockers to prevent heart attacks, which amazingly occurs only a third of the time even though we've known for 17 years it's the right thing to do.

Ounce of prevention

"In the IOM report that David [Classen] alluded to, we said that instead of only focusing on recording errors, we need to prevent the errors from occurring in the first place, and the only way we know to do that really is through electronic health record systems, something that we should do as a public/private collaborative," said Dr. Tang.

Dr. Tang highlighted **eight components for an EHR**: "The eight buckets that we at the IOM felt best categorized the key capabilities that EHR systems must have in order to deliver on the promise." They are:

1) **A complete set of health information on the patient. Much of that should be coded, allowing the computer to assist us.**

2) **Results management, (lab data and radiology data) presented in a way that humans can digest it, and notify us quickly with alerts.**

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Implementing decision support alerts for possible drug interactions can decrease the number of serious ADE's by as much as 83%.

3) **Order management: effective, legible, and organized to eliminate rework, and communicating those orders from physicians to the people who are executing those orders.**

4) **Decision support, probably the most important: a computer can combine and analyze all that information quickly.**

5) **Connecting the whole care team and community, and ultimately support a national health information infrastructure.**

6) **Give patients access to their information and tools that help them take a more active role in their health care.**

7) **Population-based tools for disease surveillance, reporting, and learning more about managing disease.**

8) **An integrated administrative process, for claims, scheduling, etc.**

The benefits are endless, he said. Implementing decision support alerts for possible drug interactions can decrease the number of serious ADE's by as much as 83%. A quarter of outpatient prescriptions have potential drug interactions but, 75% of the time, when presented with appropriate alerts, physicians changed the order.

Compliance with best practices also increases. In one setting, compliance with giving flu shots increased 78% after using the alert or reminder.

To the moon, Alice.
Dr. Tang described the many barriers to adoption of these patient safety tools that we all face. One is leadership at every level, literally from the CEO on down to department heads. Another is physician buy in, and training is a big part of getting that comfort level. A third is limited access to capital and absence of financial incentives. The need for data standards is another real issue. Last, it's a very difficult job and we lack the implementation expertise to roll out this kind of system.

The very good news, he said, is that once it's out there, people will not go back.

Finally, clarity of the goal is critical. We need to define the goal we're trying to achieve. "The better we can explain to the public, I think the better off, the sooner we'll get there."

"The question: Is this patient safety goal and use of electronic health record systems sort of like the moon shot? The advantage the moon shot had, as someone said, is with both feet firmly planted in reality and on the ground, you could always see the goal. We need to better clarify that goal so as to better mobilize the resources to get there," said Dr. Tang.

Jeff Blair, VP, Medical Records Institute, Albuquerque, N.M.

Jeff Blair, VP, Medical Records Institute, and VP, National Committee for Vital and Health Statistics in Washington, DC., described progress in the area of healthcare information standards that will support both a national health information infrastructure as well as patient safety.

"Paul [Tang] came at this whole concept of a national health information infrastruc-

ture from the perspective of patient safety, which has become an important driver in addition to cost effectiveness and quality of care. But when you look at the data or standards involved, it's difficult to separate the standards for patient safety from the standards for quality of care or for cost effectiveness. In many cases, they overlap if they're not entirely the same," Mr. Blair said.

The NCVHS-recommended core set of clinically specific terminologies will become the foundation upon which vendors will build systems incorporating such tools as clinical decision support. "The standardization of these terminologies has been something that many of us in the industry have been looking forward to for a long, long time," said Blair.

Also, overlapping these issues are major new initiatives to move toward pay-for-performance. The IOM has been tasked to come up with the performance indicators. Once known, what functions within electronic health record will be necessary to support those goals?

"Bill [Yasnoff] has proposed that for the national health information infrastructure we need to have the capability to transfer an entire electronic health record, so this is under consideration, and possibly HL7 will wind up being the entity that will facilitate that function. Also, the recent Medicare Prescription Drug Improvement and Modernization Act tasked a number of us to move forward with standards for e-prescribing," he said.

Mr. Blair said there's no initiative he's aware of to develop standards that will facilitate patients and consumers to connect into the national health information infrastructure yet. "That is a major gap," he said,

"and I think probably during this next year there'll be discussions and hopefully some initiatives to fill that gap."

Alan Goldbloom, MD, CEO, Children's Hospitals and Clinics, Minneapolis

Alan Goldbloom, MD, President and CEO, Children's Hospitals and Clinics, Minneapolis/St. Paul, said that he strongly believes that achieving safety through the EHR must be tied to your fundamental strategy in order to make it work.

The first example at Children's was conversion to electronic safety incident reporting. "We've gone electronic," said Dr. Goldbloom, "but with a totally narrative style, which essentially asks what happened, how did it happen, could this happen again, and how could this have been prevented?"

As those reports come in, a safety-office staffer extracts key words and creates a database that can be accessed with a search engine. "We have a mini-Google, if you will, around safety incidents, which nurses, physicians or any other employee can access online, either at work or at home over the Internet. Many of the incidents get entered at home when people find they have the time to do this sort of thing. People can then request stacks of information on a particular type of problem to be pulled," said Dr Goldbloom.

Children's now totals about 250 incidents reported a month. It encourages the reporting of "a good catch," or near miss. Last year the hospital had 80 requests for stacks to

"We have a mini-Google, if you will, around safety incidents, which nurses, physicians or any other employee can access online, either at work or at home over the Internet."

The Children's Medical Organizer gives families the capability of compiling their own online medical record, highlighting things they need to transport with them, including medication lists, appointments, conditions and problems.

be pulled on incidents from the search engine. Those have been translated into specific action plans and "have been a real boon to our safety action team," he said. Safety has been a major strategy at Children's for several years and has been tied to incentive compensation for all managers, directors and the executive team: 25% of compensation is related to specific safety objectives.

This year Children's safety objectives are tied more specifically to issues around transitions of care—moving children from the emergency department to the ward, the OR to the ward, and so forth. "We know errors happen because of problems in moving the information with the patient," said Dr. Goldbloom. A unique initiative to address that issue is called the Children's Medical Organizer, an online tool for parents.

Parents of children called "frequent flyers," kids with serious chronic illnesses who are in and out of the hospital, tend to know the most about their children's disease. Yet they often have eight to 10 different specialists. The Children's Medical Organizer gives families the capability of compiling their own online medical record, highlighting things they need to transport with them, including medication lists, appointments, conditions and problems. They can access that information at every visit site within the system or with an outside provider. "It helps put those patients and families in control," he said.

Children's is rolling out CPOE later this year and has found that the culture of using electronic information among its staff has moved forward at a steady pace. "Today people feel they need to be on board the train as they start to see the advantages. At a certain point, physicians aren't resist-

ing anymore, they're demanding better systems and more information from the system, and they're demanding better performance," said Dr. Goldbloom.

Children's devotes 5.5% to 6% of its operating budget to IT and he said that will likely continue. Experience with implementing IT over the last 15 years has taught Goldbloom that success is not dependent on the product but how it is implemented. A key factor has been devoting significant budget resources to supporting users. For example, his previous hospital hired a full-time physician director for IT—the about-to-retire head of the emergency department—and gave him a new career. He had the respect of the hospital's clinicians. Also, as each ward was brought online, it was flooded with support people 24 hours a day for the first three weeks.

"I agree with what Jim Anderson said yesterday and that is, don't wait until you're ready, because you'll never be ready; there will always be a new application about to be issued that will be better than the one you have now. But start the momentum and get the train out of the station even though there will always be a few who will be following the train running down the tracks. I think the secret is to do that as quickly as possible," said Dr. Goldbloom.

James M. Walker, MD, CMIO, Geisinger Health System, Danville, Pa., talked about physician buy-in, specifically training. He said there are many valid reasons physicians historically resist EHRs and informatics in general, and one is the training they get.

Among the many flaws in training physicians, nurses and other users is

that it takes way too long. It's not unusual to spend 16 hours in training before going live with an EHR. Furthermore, **the training is rarely scenario-based or reality-based**. "The training is rarely focused tightly on what the user needs to do to get through the first month using the system," said Dr. Walker. "It's not competency-based, so people sit and twiddle their thumbs listening to things that they know, and then, of course, things that they don't know there's no time for. Training is not just-in-time and doesn't take advantage of the teachable moment. It is also not ongoing. We are prone to treat the EHR as if it were a plumbing system. We put the parts in and as long as they're not leaking, we're done," he said.

Geisinger learned that it's critical to have trainers and analysts for workflow and system development work together and be cross-trained. That way the trainers are trained a little as analysts, and the analysts can function as trainers. Training begins with a pre-kickoff meeting for every clinic site and continues all the way through analysis and build. Trainers are available either to do ad hoc one-on-one training or brief "teaser" training in control-team and departmental meetings.

This approach has a number of obvious benefits. It means that analysts are thinking about whether the system is usable and trainable from the outset, and they are responsible for that. And it also means that trainers are developing their training curricula based on a genuine understanding of how a particular clinic and its people work. As a result, it's natural for them to provide reality-based, scenario-based training that really meets people's needs.

Just-in-time training takes a number of forms. Geisinger's current standard: If I can't use it after five or 10 minutes using the quick-card starter, I'm just not going to use the system. "We're working toward that model, but obviously because of the complexity and difficulty it isn't entirely practicable for EHR training," said Dr. Walker.

Geisinger conducts almost all intense training within a week before go-live, assuming that people will forget anything they're taught before that. It's expensive and puts a lot of stress on training teams, but the organization is committed to it.

Another key training strategy: Geisinger floods people with support, with "shadowing" available from go-live on for two weeks. Flexibility is key, however, said Dr. Walker. "Some departments say we've got it, you can go home, and other departments say can we have another week? Shadowing is critical: back to that teachable moment. It's fine to give people enough introduction to get them started, but they need help when they're actually trying to solve a problem."

All help calls go to the central help desk and all EHR calls go to a trainer online, who's ready to answer questions and who can access the user's PC so they actually walk them through the process they need to understand.

Dr. Walker cited an important lesson learned in following up an implementation. "We found that if you return to a clinic a year after go-live, you'll find maybe 20% of people use it the way the optimized workflows were designed for the EHR. So, we have a team that does nothing except return to clinics to analyze workflows and provide specialized training."

Geisinger conducts almost all intense training within a week before go-live, assuming that people will forget anything they're taught before that.

To empower patients to carry their own medical record, Queens Health developed a smart card. If patients are taken to an ER in the borough of Queens, any hospital's ER physicians can use a reader to view patient data, eliminating redundant tests like EKGs, because the latest EKG results are embedded in the card.

Pete Velez,Senior VP, Queens Health Network, and Executive Director, Elmhurst Hospital Center, Elmhurst, NY

Pete Velez, senior VP, Queens Health Network, and Executive Director, Elmhurst Hospital Center, Elmhurst, NY, discussed next steps beyond CPOE, particularly what it is we should do to convert the wealth of data we accumulate in our systems to useful and practical information to support patient outcomes. He also addressed how we engage the larger community in this process.

Mr. Velez asked why as an industry we're still at such an early stage in development—only 300 of the nation's 4,900 non-governmental hospitals have CPOE and only 40 have fully met Leapfrog standards.

What drove Queens Health's IT development was sheer volume: it has grown 28% in the last five years. As a result, the organization realized it needed to give its physicians and employees the basic IT tools to manage continual growth and still maintain levels of care. The organization has two major acute care hospitals located in the borough of Queens, which has a population of 2.3 million. It has about 22 outside physician practices and collaborates with 550 physicians who have freestanding practices in the community. Queens Health provides more than 1 million ambulatory care visits, and another 210,000 ER visits, while providing about 3.4 million prescriptions and orders a year.

Queens Health received the Davies Award as a result of its integration of myriad new IT systems, including a comprehensive electronic record incorporating order entry, PACS, robotics in its laboratories and pharmacy. "We have to learn to focus on safety, and that is what drives our agenda and vision," said Mr. Velez.

Mr. Velez said Queens Health wants to be able to convert the wealth of data that it gathers from the 4,000 encounters it experiences each day. "We decided to develop a repository that would allow us to mine that data in a way that would feed the information to physicians in a format they can manage effectively. We developed a front-end registry in collaboration with our docs, and that front-end registry now enables our physicians to manage chronic diseases," he said.

Mr. Velez said that initially the registry held about 5,000 diabetic patients and allowed physicians to not only get a global assessment but to define which patients are not in compliance. He said if he could reduce a hemoglobin level by 1%, he could reduce morbidity by 35% and mortality by 25%. "When we talk about giving the tools to our physicians to create a safer environment, it's important that we begin to use the systems that we have developed to take them to the next level," said Mr. Velez.

To empower patients to carry their own medical record, Queens Health developed a smart card. If patients are taken to an ER in the borough of Queens, any hospital's ER physicians can use a reader to view patient data, eliminating redundant tests like EKGs, because the latest EKG results are embedded in the card. "They do not have to worry about the patient remembering the medication or the latest procedure. We want

to transform our system and go beyond the four walls of our institution, and begin to communicate electronically with the general community. Our intent, hopefully, is not only to improve outcomes for our patients but also to improve outcomes for our community," said Mr. Velez.

Conclusion

Mr. Nelson concluded the conference by thanking everyone for making 2004 the best Scottsdale Institute conference yet. He invited everyone back for next year's

Spring Conference and encouraged participation in the 2005 fall conference at Partners Healthcare System in Boston, and the 2005 Winter Conference at

Intermountain Healthcare in Salt Lake City. Mr. Nelson also expressed gratitude to the members for their support of the Institute and for helping it reach critical mass while maintaining its original purpose of executive networking and knowledge sharing.

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Spring Conference Faculty

Name	Title	Company	City and State
Alan Abramson, PhD	Senior Vice President and CIO	HealthPartners	Bloomington, MN
Brian Anderson, MD	Chief Medical Officer	Allina Hospitals & Clinics	Minneapolis, MN
James Anderson	President and CEO	Cincinnati Children's Hospital	Cincinnati, OH
David Bernd	Chief Executive Officer	Sentara Healthcare	Norfolk, VA
Jeff Blair	Vice President	Medical Records Institute	Albuquerque, NM
David Classen, MD	Vice President	First Consulting Group	Salt Lake City, UT
Molly Joel Coye, MD, MPH	Chief Executive Officer	Health Technology Center	San Francisco, CA
Erica Drazen	Vice President, Emerging Practices	First Consulting Group	Lexington, MA
Dan Eckert	President and COO	Neoforma, Inc.	San Jose, CA
Susan Flanagan	Chief Operating Officer	Lucile Packard Children's Hospital	Palo Alto, CA
John Glaser	Vice President and CIO	Partners HealthCare System, Inc.	Boston, MA
Alan Goldbloom	President and CEO	Children's Hospitals & Clinics	Minneapolis, MN
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Stanley Hupfeld	President and CEO	Integris Health	Oklahoma City, OK
Jackie Jensen	Director of Patient Flow	Allina Hospitals & Clinics	Minneapolis, MN
Van Johnson	President and CEO	Sutter Health	Sacramento, CA
Jim Jones	Solutions Manager	Hewlett-Packard	Groton, MA
Alberto Kywi	Chief Information Officer	Cottage Health System	Santa Barbara, CA
Siew Lam, MD	Chief Medical Information Officer	Clarian Health Partners	Indianapolis, IN
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Don Lyons	Deputy Chief Information Officer	U.T. M.D. Anderson Cancer Center	Houston, TX
Sharon Martin	Vice President	U.T. M.D. Anderson Cancer Center	Houston, TX
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Dennis Miller	Director, IT Administration	Memorial Healthcare System	Hollywood, FL
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Gayle Vernon Simkin	Vice President and CIO	Catholic Healthcare West	Phoenix, AZ
James Skogsbergh	President and CEO	Advocate Health Care	Oak Brook, IL
Debbie Slye	Director of Change Management	Adventist Health	Roseville, CA
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