

Driving breakthrough quality in health and life sciences

A SPECIAL SUPPLEMENT TO:
**Transforming Your
Enterprise Magazine**
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COVER

Extending the IT foundation at Harvard Partners Center for Genetics and Genomics. Page 2

06

Automation improves care delivery

18

Tamper-resistant prescription pads are "hard pill to swallow"



Technology for better
business outcomes





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Experiences

- 02 Extending the IT foundation for personalized medicine**
How Harvard Medical School – Partners HealthCare Center for Genetics and Genomics is keeping pace with growing data volumes from new sequencing technologies.
- 06 Automation improves care delivery**
Oklahoma Health Care Authority automates newborn registry and SoonerCare membership processes to simplify consumer access.
- 10 North Shore prescribes better technology**
Thin client solution delivers faster response and flexibility to clinicians, improves lifecycle management and lowers costs.
- 12 Establishing one of the first state-wide health information exchanges**
Rhode Island is building a groundbreaking network for the exchange of electronic health information.
- 15 Breaking new ground in Sherbrooke**
How a Quebec-based hospital is embracing HP's Digital Hospital Initiative as a creative solution to staff shortages and other constraints.

Solutions

- 16 Digital hospitals in action**
If you're considering a digital hospital strategy, a visit to the HP Health Center of Excellence may be just what the 'tech doctor' ordered.
- 20 A booster shot for health-care documentation**
New solution reduces the time and cost of capturing, distributing and storing health-care documents.
- 21 Alleviating an identity crisis**
Certified printers produce advanced patient wristbands to reduce medical errors, enhance care and improve compliance.

Cover (left to right): John Glaser, CIO, Partners HealthCare; Sandy Aronson, Executive Director of Information Technology, Harvard Medical School – Partners HealthCare Center for Genetics and Genomics. Partners HealthCare, a non-profit organization founded in 1994, is an integrated health-care system that offers patients a continuum of coordinated high quality care.

An unending quest for quality in health and life sciences

Information fuels the ability to deliver cutting edge care. As science evolves and patient demands intensify, how organizations capture, manage and gain insight from information determines whether they lead or simply try to keep up.

In 2008, the Health and Life Sciences supplement to *Transforming Your Enterprise* Magazine focused on how HP's business technology plays a critical role in speeding innovation to practice. As the pace of innovation continues to accelerate, quality in connecting information, processes and people becomes even more critical. That unending quest for quality is the foundation for delivering optimum patient care.

In this supplement, we explore how a few industry leaders are driving breakthrough quality. For example, Harvard Medical School – Partners HealthCare Center for Genetics and Genomics chose HP Extreme Storage to build the foundation required to deliver on its vision of flowing genetic and genomic discoveries quickly into patient care (page 2).

The Oklahoma Health Care Authority integrated automation to achieve greater accessibility and simplicity in health-care access and delivery (page 6). And Centre Hospitalier Universitaire de Sherbrooke is implementing HP's Digital Hospital to improve productivity and workflow through real-time health information (page 15).

From human genome sequencing to patient claims processing, HP's extensive portfolio of products, solutions, services, and partnerships help health and life sciences organizations achieve breakthrough quality for better business and health outcomes.

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- * Page 12 — “Rhode Island Awards EDS Contract to Create First Statewide Electronic Health Network,” EDS press release, July 30, 2007.
- * Page 18 — Health Affairs, 28, no. 1 (2009): 246-261

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Experiences



(Left to right) John Glaser and Brent Richter, Partners HealthCare; Sandy Aronson, Harvard Medical School – Partners HealthCare Center for Genetics and Genomics.

Extending the IT foundation for personalized medicine

Harvard Medical School — Partners HealthCare Center for Genetics and Genomics wanted its storage to keep pace with data volumes from new sequencing technologies so IT could continue to enable optimum patient care.

In terms of health care IT, what does the next five years look like? It's an open-ended question, but the IT team at Harvard Medical School – Partners HealthCare Center for Genetics and Genomics (HPCGG) has a quick and targeted response. To support its vision of personalized medicine, where clinicians are able to make treatment and medication decisions based on a patient's genetic profile, IT has and will continue to play a huge role.

In the past five years, HPCGG focused its efforts on building a viable IT foundation with the right hardware and innovative software. "Making personalized medicine really work requires a vast amount of IT infrastructure," says Sandy Aronson, Executive Director of Information Technology, HPCGG. "We've been building that foundation incrementally so we are in a strategic position to address the challenges stemming from next generation sequencing technologies."

Automation improves care delivery 06

North Shore prescribes better technology for better medicine 10

Establishing one of the first state-wide health information exchanges 12

“Making personalized medicine really work requires a vast amount of IT infrastructure.”



In partnership with HP, HPCGG deployed a large multi-cluster compute facility to support researchers throughout Partners HealthCare, which includes Massachusetts General Hospital and Brigham and Women’s Hospital. In addition to processing capabilities, HPCGG implemented a shared storage approach for raw instrument data, results files and database objects for increased collaboration across institutions.

Leveraging that shared infrastructure, HPCGG and HP collaborated in the creation of the Gateway for Integrated Genomics-Proteomics Applications and Data (GIGPAD). The software environment integrates disparate laboratory information management systems (LIMS), provides a portal to submit and access biological samples, and enables efficient management of analytical workflows and data repositories.

“Everything we do is to benefit the patient,” says Trung Do, Executive Director Business Development, Partners HealthCare. “While the deeper integration of genetics and genomics into clinical practice is a huge advance for patient care and diagnostics, we also recognized the pressure it was exerting on our systems. There was a new set of requirements in how we practice medicine and run our business, and we had to ensure that IT remained an enabler of both research and patient care.”

IT as an enabler

For organizations like HPCGG, there is an ongoing concern that IT must keep pace with the biology, especially in terms of storage capabilities. As the costs of sequencing technologies continue to fall and the volumes of data from those technologies continue to rise, that concern becomes a reality that IT must grapple with daily. The focus is on ensuring that IT is not a constraining factor in realizing the benefits of next generation sequencing technologies.

“The rate of change in the genomics field is accelerating with new instruments initially introduced for research purposes transitioning into clinical use,” says John Glaser, CIO, Partners HealthCare. “We are seeing testing volumes on these new instruments ramp very rapidly. We work closely with HP to constantly develop, enhance and deploy the IT solutions that enable us to keep pace with the field.”

With the new technologies, it can take approximately one month to sequence a human genome in a research context, which is about 10x faster than what was available previously. The sequencing process generates very large data volumes, and the complexity associated with image analysis, quality scoring, base-calling and information analysis requires a high performance computational environment.



>> “Working with HP, we are building and extending our IT foundation to and genomic discoveries flow quickly through IT and governance

Using the previous generation of sequencing technologies, organizations could reasonably predict data growth; estimates hovered around a doubling of data every 18 months. But the new technologies have changed all of that.

“Four years ago, we were able to have a fairly accurate picture of our storage needs,” says Brent G. Richter, Director of Enterprise Research Infrastructure and Services, Partners HealthCare. “At the end of 2007, we expected to have approximately 10 terabytes of data across all functions in the organization. But then we obtained two next-generation sequencing machines in that year, and far exceeded those estimates. By the beginning of 2010, we now expect a petabyte will be required to be online.”

HPCGG plans to acquire one more new sequencing machine in the next three months, with a fourth in the six to nine month timeframe. Adding to its storage requirements, HPCGG is also responsible for supporting other research platforms and technologies across the

Partners HealthCare teaching hospitals. According to Glaser, “Rapidly decreasing sequencing costs have the potential to increase progress in the field of personalized medicine. However, significant IT infrastructure will be required to realize this potential.”

Richter highlights that the falling costs of sequencing will lead to increased demand—more labs, researchers and organizations will see genomics as an attractive and viable option for research and diagnostics. And that will increase the pressure on IT resources to act as an enabler rather than an obstacle.

Cost-effective storage

Many organizations choose to manage the storage challenge by discarding the principal data (images) once researchers get to the second level of analysis. But there are implications to throwing away this data when biological samples are hard to obtain and replace. The key is to find a way to store and share that data cost-effectively from the initial analysis of generating base-call sequence data and the analysis by investigators and



realize our vision of personalized medicine—ensuring genetic
so they can benefit patients at the point of care.” <<

diagnostics laboratories through to post analysis
visualization and dissemination of results to researchers,
electronic medical records or clinicians.

To address its storage-related issues, HPCGG chose HP
Extreme Data Storage, which provides multi-protocol file
service backed with a half petabyte of usable storage. In
addition to the cost-effective storage capacity, HPCGG
will be able to integrate the new storage system with its
existing cluster environment so users can work on the data
without moving it through the network.

“Moving large amounts of data around is a significant
challenge for us,” says Richter. “When we have to move
data from Modular Smart Array file storage to the High
Performance Computing storage environment, it generates
a bottleneck in the delivery of results to end users. By
keeping it all within the same storage pool we can
eliminate the migration, save on network bandwidth and
reduce overall processing time.”

And that is a significant benefit for researchers. For

example, an entire genome generates approximately
30 terabytes of image data. Investigators or molecular
labs end up working with one or two terabytes of that
data for follow-on analysis. For HPCGG, the general
benchmark for moving data is one day for one
terabyte. By keeping the biomedical and life science
data in one place, users can work on it almost
immediately instead of waiting a day for the
migration.

“Our ultimate goal is to enable clinicians to
incorporate the latest genetic information into patient
care so that they can maximize the 14.7 minutes they
typically have with each patient,” says Aronson.
“Working with HP, we are building and extending our
IT foundation to realize our vision of personalized
medicine—ensuring genetic and genomic discoveries
flow quickly through IT and governance so they can
benefit patients at the point of care.”

For more information, see HP StorageWorks at:
www.hp.com/go/transform/HLS



John Calabro (left) and Richard Evans of the Oklahoma Health Care Authority automate newborn registry to improve how the state conducts the business of health care.

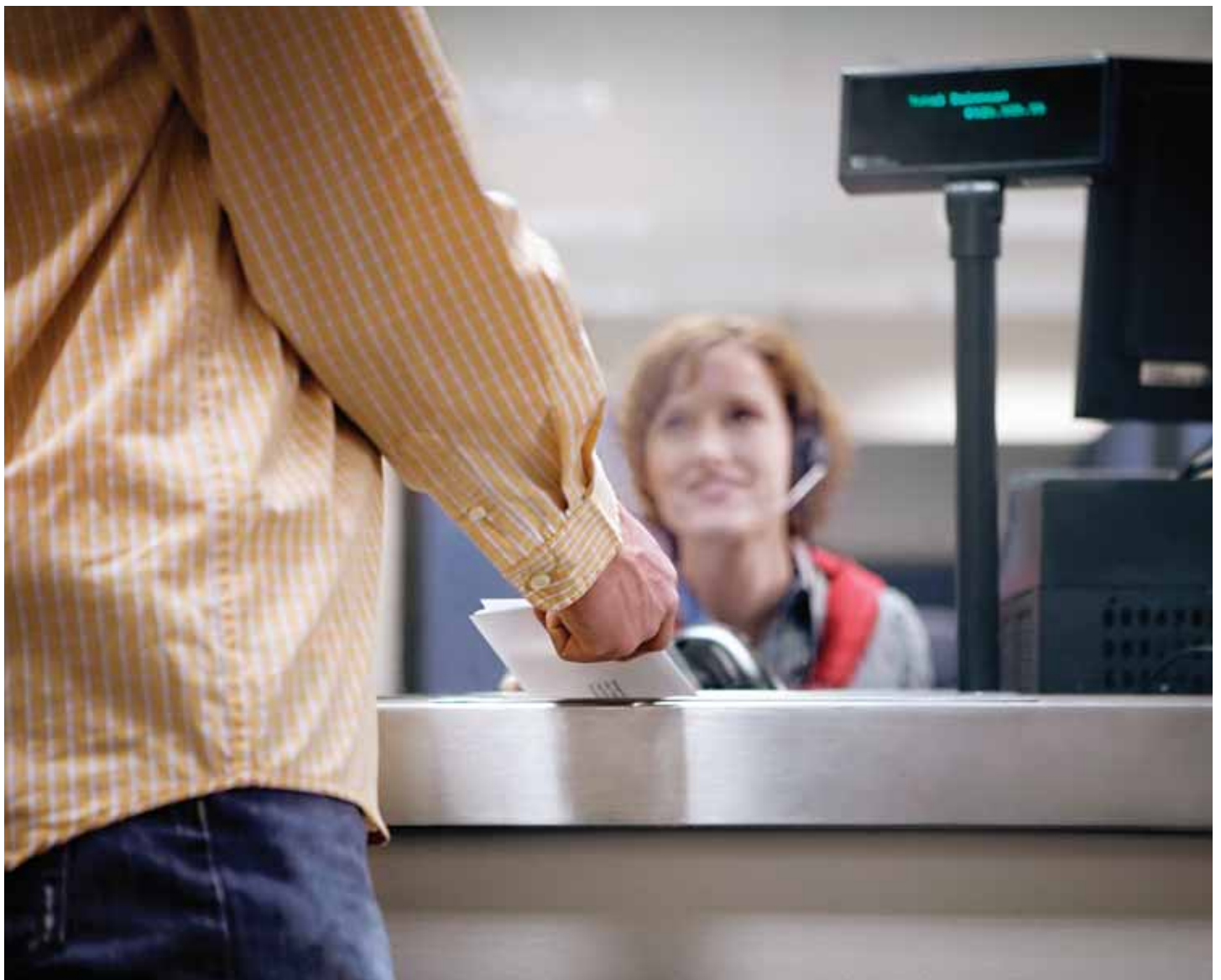
Automation improves care delivery

Oklahoma Health Care Authority (OHCA) automates newborn registry and SoonerCare membership processes to simplify consumer access to care and improve efficiency of provider care delivery.

When a baby is born, it's a joyous, hectic and overwhelming experience, and the last thing on a new mother's mind is paperwork. But for mothers in Oklahoma who qualified for SoonerCare (Oklahoma Medicaid), they had to fill out paperwork to enroll their newborn and receive a primary care provider (PCP).

"We had a paper form, the NB-1, which hospital staff filled out and faxed in to the Oklahoma Department of Human Services (OKDHS) to initiate SoonerCare membership for the newborn," says Richard Evans, Automated Eligibility and Data Integrity Manager, Oklahoma Health Care Authority. "It was an inefficient process with limited mechanisms for feedback or notification to chart the status of the eligibility request."

The Oklahoma Health Care Authority is the primary entity in the state responsible for controlling the costs of state-purchased health care. Its goal is to purchase state and



federally funded health care in the most efficient and comprehensive manner possible and to study and recommend strategies for optimizing the accessibility and quality of health care. So the inefficiencies in the manual, paper-based process were of critical concern.

Providers could not bill for care until they received an ID number for the newborn, which sometimes took days or weeks. There was no efficient way of checking if OKDHS received the NB-1 form, and providers were forced to keep checking back frequently to confirm membership.

For mothers, PCP selection was also problematic. Because of the lag times in assigning membership ID numbers, a mother often left the hospital without choosing a PCP for her newborn. The OHCA mailed out a paper form to initiate selection. But it was confusing because mothers often didn't know who to choose. If a mother didn't pick a PCP within 45 days, OHCA auto assigned one, which

occurred with 25 percent of mothers per year.

"We felt it was essential to simplify the process of getting a newborn added to the system to improve how we conducted the business of health care," says John Calabro, Chief Information Officer, Oklahoma Health Care Authority. "It was critical that when a mother left the hospital, her baby had a medical home. But equally as important, we wanted providers to have everything they needed to bill us for services rendered."

Automating for efficiency

The newborn registry was the first phase of a comprehensive automation initiative at the OHCA. The goals were to replace the paper process for adding deemed newborns with a real-time, electronic process; to return newborn member IDs to speed and simplify billing for hospitals; and to provide a method for PCP selection for the newborn.



Currently, 58 hospitals throughout the state of Oklahoma are using the electronic NB-1 process, and providers have added 15,631 newborns to the system. With the adoption of automation, 86 percent of newborns are now added within zero to five days and 80 percent of mothers receive their first choice for PCP assignments.

“Our initiatives focus on improving SoonerCare for our members and providers,” says Mike Fogarty (pictured next page), Chief Executive Officer, Oklahoma Health Care Authority. “The medical home model of care is a major 2009 initiative. The e-NB-1 accelerates how members and providers work together within that model by creating an almost immediate link between birth and after care. Based on the success of the newborn enrollment process, we are extending electronic enrollment to anyone who seeks health coverage in the SoonerCare program.”

Automated eligibility

Currently, OHCA is tackling another significant challenge— applying for SoonerCare. The No Wrong Door initiative focuses on automating the application process so that any access to the Internet is access to the program. The goal is to enable citizens who qualify for SoonerCare to enroll online without having to visit a welfare office.

“In the last five years, we have sought to shift the policies and practice of the program away from its welfare roots toward a modern health care coverage approach,” says Fogarty. “Families at moderate income levels qualify for SoonerCare. We want to eliminate the welfare stigma for Oklahomans seeking access to affordable health care.”

The OHCA worked closely with EDS, an HP company, and its user experience team in the development of both



“Based on the success of the newborn enrollment process, we are extending electronic enrollment to anyone who seeks health coverage in the SoonerCare program.”

— Mike Fogarty, CEO,
Oklahoma Health Care Authority



applications. For the NB-1, EDS created a wire frame—a sample application with proposed functionality and design—which the OHCA presented to several hospitals and medical clinics for feedback. It was a chance for the OHCA to sit down with the experts that would be using the application every day and solicit their input on wording, look and feel, functionality and usability. The experience was so valuable during the newborn registry project that the OHCA made it a key element in the online membership application development.

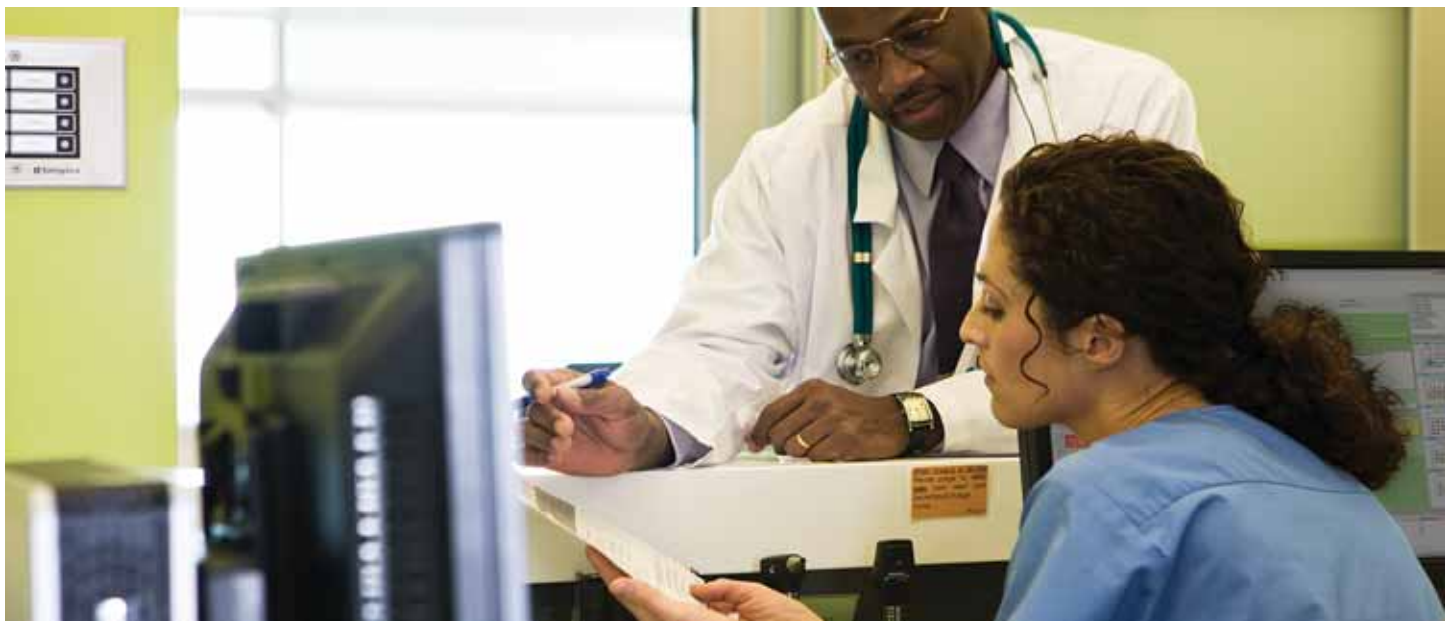
“Being able to elicit feedback from users prior to writing and developing the application is invaluable,” says Calabro. “But it was also a chance for us to strengthen relationships with our community partners by making them a part of the process. Their assistance is critical in getting citizens to enroll for eligibility online. The user experience team was a strategic way to drive that cooperation while positioning us to providers as responsive and proactive so they will consider contracts with us.”

The OHCA prides itself on its thought leadership and its role as a trailblazer in decoupling Medicaid from welfare. And the OHCA’s partnership with EDS is a key driver in the early adoption of technologies that support that change. As a solution partner, EDS offers resources and expertise to help the OHCA enable its provider community with innovation so clients receive the best care possible.

“Oklahoma is an excellent example of the EDS 360 Degree Health Care Continuum in action,” says Scott Mack, General Manager Midwest Region State Health Services Group, EDS. “The OHCA is improving the way it does business by streamlining processes, leveraging shared applications, improving collaboration between providers, the state and health care beneficiaries. As a result, administrators deal with less hassle, the state can pay faster, and citizens have better access to care and services.”

With 20 percent of Oklahoma’s 3.5 million citizens currently enrolled in SoonerCare, the OHCA is positioned strategically to serve the nearly 20 percent who remain uninsured if universal health-care mandates pass. “Publicly-funded health care is on the national agenda,” says Fogarty. “Our automated systems, particularly eligibility, support that evolution. There is no question that Medicaid is a critical part of the solution for reforming health-care delivery and purchasing. And Oklahoma is leading the transition from welfare to health care because of the accessibility and simplicity that we’re delivering to citizens.”

For more information, see EDS 360 Degree Health Care Continuum solution at:
www.hp.com/go/transformHLS



North Shore prescribes better technology for better medicine

North Shore Medical Center implements HP Thin Client Computing solution to deliver faster response and flexibility to clinicians while improving lifecycle management and lowering costs.

An average day for North Shore Medical Center's IT Department went something like this...clinicians complained about the slow response and limited flexibility of ageing technology; priority one clinical troubleshooting taxed IT resources to the limit; and the business was onside for a technology upgrade, but stressed cost cutting and improved lifecycle management.

How could the IT Department satisfy clinician, business and IT requirements with one technology solution?

North Shore Medical Center, a 300-bed community hospital affiliated with Partners HealthCare, serves north suburban Boston including Salem, Lean, Danvers and other communities. The system also operates 70 remote sites, ranging from small physician offices to clinics. To support effective care delivery, doctors and nurses relied on desktop technology, which was nearing end of life cycle. Log-ons were slow. And patient requirements often interrupted application sessions, making it difficult for physicians to establish effective workflow.

"On a good day, it took two and a half minutes to log into a desktop," says Demetrios Papayannopoulos, IT Manager, North Shore Medical Center. "Approximately 50 percent of the time, doctors went to care for patients while they were conducting order entry for labs and x-rays or following up with routine paper work. Once a doctor left the PC, another doctor could log him or her off, forcing the first doctor to begin those administrative tasks from the beginning. The productivity implications were extremely frustrating for the doctors."

The clinicians were desperate for faster responding technology that could "follow them" as they moved throughout the hospital. They also wanted a better



maintenance process that didn't require IT to take devices for troubleshooting. The business also had requirements of its own including longer life cycle management as well as flexible technology that could support the rapidly changing health care sector. And of course, IT had to meet all of these needs while cutting costs. Papayannopoulos had priorities too. He wanted to enable centralized support for remote sites to reduce the reliance on IT.

After some thorough research, Papayannopoulos chose 200 HP Compaq t5730 thin clients, supported by five HP ProLiant BL685c G5 blade servers, running Citrix software and VMware for virtualization to meet diverse stakeholder demands.

Previously, North Shore spent \$1000 per desktop for hardware and software, which didn't include maintenance. With the thin client solution, North Shore was able to reduce that spend to \$650 per desktop, with five-year support. The initial implementation covered 50 percent of the 500 clinician desktops, resulting in a 30 percent cost savings.

"We outfitted the doctors' desks with thin clients, but the real innovation came in how we enabled the nursing staff," says Papayannopoulos. "Nurses move through the hospital to verify that the right patient gets the right medication. We mounted wirelessly-capable thin clients on their carts, eliminating the reliance on laptops. With the thin clients, we put the technology right on the floor, enabling productivity and optimum medical care."

The feedback from physicians has been very positive. Papayannopoulos notes that many doctors call the thin clients "turbo" devices and are pushing for a full



replacement. In addition, departments including finance and patient registration have seen the gains made by physicians and want to experience similar benefits in efficiency and productivity.

Papayannopoulos is also pleased about the technology advantages. "The servers are handling the load extremely well; they're operating below 20 percent capacity. By running the thin clients on three VMware servers, we can grow without having to do anything on the back end. And with the applications on Citrix servers, we can address issues from the data center level so we don't disrupt the doctors."

With a drop of approximately 35 percent in help desk calls, Papayannopoulos has been able to direct IT resources to other departments. Overall, eight technicians were supporting devices in the clinical area; now, five provide clinical support while the other three are free to work on value-added projects.

For Papayannopoulos, HP's strength in thin client computing and its relationship with Microsoft®, Citrix and VMware were the true differentiators. "HP really came through as a trusted advisor for North Shore," he says. "For example, the embedded operating system in the thin clients was missing features that we needed. Microsoft helped us determine what needed to be added, and then HP completed a specialized operating system build to incorporate those elements. That deep level of collaboration and HP's leadership enabled our business so we could truly leverage better technology to deliver better medicine."

For more information, see HP Thin Client Computing solution at: www.hp.com/go/transformHLS



Establishing one of the first state-wide health information exchanges

In bringing together public and private interests, Rhode Island is building a groundbreaking network for the exchange of electronic health information.

Rhode Island is the smallest U.S. state by area, but it has a history of thinking big. One of the most recent examples is an ambitious agenda to improve health care throughout the state, including an “Anytime, Anywhere Health Care” program that aims to deliver electronic access to health information for all Rhode Islanders. These efforts have been buoyed by federal funding for a real-time patient health information system intended to reduce health-care costs by eliminating duplicative tests and procedures.

“With the creation of a state-wide Health Information Exchange,” said Rhode Island Director of Health David R. Gifford in July 2007, “doctors will be able to look up their patients’ critical health information, giving them a more complete understanding of their patients and allowing them to provide higher quality, safer, more coordinated care.”*

Skip forward a couple of years and one of the country’s first state-wide health information exchanges (HIEs) is about to go live. In consolidating the health information of state residents in a secure network, Rhode Island’s “currentcare” HIE is designed to provide authorized hospitals, doctors and other health-care providers with a more complete patient health file to aid in patient care.

currentcare is still in its infancy and has experienced some growing pains, but state leaders report groundbreaking progress on several fronts.



Merging public and private interests

Efforts to digitize and standardize health-care information are underway around the world. What makes Rhode Island's *currentcare* project unique is its broad scope, which will span the entire state and is aimed at serving the needs of both public and private interests.

"Similar efforts have failed because they were weighted or subsidized by one side or the other," says Mark Roman, Vice President of the Global Healthcare Industry practice at EDS, an HP company, which was contracted to build Rhode Island's HIE. "Rhode Island is bringing all parties together—both public and private—to benefit the entire state."

"Our biggest challenges have not been technical," confirms Amy Zimmerman, Chief of Health Information Technology for the Rhode Island Department of Health. "They have been policy and business related."

Public and private interests are sometimes at odds, she explains, making it challenging to find common ground. The needs of consumers (i.e. privacy) must be balanced with the needs of providers (i.e. access to comprehensive health information) if *currentcare* is to truly improve the quality and safety of health care for Rhode Islanders.

"We have been very inclusive of both public and private stakeholders, which is certainly not the path of

least resistance," says Zimmerman. "We're doing the hard work of consensus building up front in order to develop a system that works for everyone and benefits the community at large."

With so many stakeholders and contributors in the mix, a clear governance model was essential. The Rhode Island Quality Institute, a community-oriented non-profit organization, is at the forefront of the project and now serves as the state's designated Regional Health Information Organization (RHIO). The Quality Institute established five workgroups—Steering Committee, Technical Solutions Group, Policy and Legal Committee, Consumer Advisory Committee and Professional Advisory Panel—to gather community input and help shepherd *currentcare* forward. These workgroups contain a cross-section of public and private representatives, including physicians, consumer advocates, hospital chiefs, Department of Health personnel, health-care technology executives, attorneys and others.

"Rhode Island is a small state that has a history of bringing people together in support of the community," Zimmerman points out. "That said, it took our workgroups time to build trust, find middle ground and reach consensus. But their work made future progress possible."

Incremental progress

When *currentcare* goes live in a matter of months, it



will compile laboratory and medication history information from four sources: three laboratories (including the state's public health laboratory) and one company focused on e-prescribing and medication history. The system will be pilot tested in a range of provider settings, including hospitals, long-term care and ambulatory clinical facilities such as pediatrician offices and community health centers. Efforts are underway to identify additional data partners, including more labs and pharmaceutical groups. Thereafter, the state plans to incorporate additional data types into the HIE, such as radiology reports, discharge summaries and Medicaid information.

"We've been going through the rigor of gaining consensus and building the network," says Zimmerman. "It's now a matter of proving the business case and attaining additional funding, so we as a state community can continue to grow the HIE."

EDS has been instrumental throughout the process, she adds. The company has worked with the state and its community stakeholders to build, integrate and customize *currentcare*. After it goes live, EDS will host the system from its Rhode Island Data Center while continuing to work with the state and the Rhode Island Quality Institute to expand *currentcare* from its Electronic Health Record Center of Excellence in Warwick, Rhode Island.

"In addition to building Rhode Island's HIE, EDS has responded to a variety of stakeholder perspectives," Roman says. "Listening, exploring options and setting expectations have been as vital as application customization. Showing incremental success without losing sight of the big picture has also been important."

EDS has more than 7,000 health-care IT experts who are working with the world's leading health-care

insurers and government agencies to reduce inefficiencies, increase business performance and solve pressing health-care issues. The company performs 2.4 billion health-care transactions annually on behalf of its clients, including one billion in claims.

"EDS has been a valuable advisor," says Zimmerman. "They have understood our financial hurdles and the challenges related to consensus building. Throughout, they have remained flexible and helped us change course when necessary."

Advice for others

In developing *currentcare*, Rhode Island has been somewhat of a prototype for others wanting expansive health information networks. Zimmerman says several lessons have been learned along the way.

"We have gone down paths that we didn't expect at first," she reveals. "Some of our preconceived notions needed to be modified based on community feedback and recommendations from our workgroups."

Zimmerman points to an "opt-in" model for the HIE that wasn't originally planned but became necessary after public representatives voiced concern over patient confidentiality and privacy.

"Create an open dialog with stakeholders, actively listen and seek compromise," Zimmerman advises others seeking similar HIEs. "Remain flexible and transparent when balancing policy decisions, business operations and technology. And build a business case early that establishes the financial sustainability of the network. These are all critical components of success."

For more information including an EDS Mayo Clinic Viewpoint paper, see EDS 360 Degree Health Care Continuum solution at: www.hp.com/go/transformHLS

Breaking new ground in Sherbrooke

How a Quebec-based hospital is embracing HP's Digital Hospital Initiative as a creative solution to staff shortages and other constraints.

"To be at the avant-garde of innovation." That's the motto at Centre Hospitalier Universitaire de Sherbrooke (CHUS), a two-site health-care facility serving more than one million people in the province of Quebec.

Put into action, it means the hospital aims to be among the first to adopt new tools, knowledge and solutions, and over the years it has done just that, counting itself among the early adopters of an electronic patient record (EPR).

Now CHUS is one of the first in North America to embark on a Digital Hospital Initiative with HP, and according to General Manager Patricia Gauthier, the project is expected to address very real clinical challenges such as a severe lack of personnel, long wait times and bed shortages at a time when health-care budgets are constrained.

"We strongly believe that the Digital Hospital Initiative will help us to provide better service to our patients by streamlining repetitive tasks and making our medical staff more productive," says Gauthier. "This isn't a technology journey; it's a clinical journey," she notes.

The process started with a request for proposal (RFP) in February 2008. CHUS was constructing a new building at Hôtel-Dieu in downtown Sherbrooke and was searching for a technology partner who could help chart a new course in health-care delivery. "The proposal from HP was the best fit with our vision," says Gauthier.

Prior to the RFP, CHUS sent a delegation of technical and clinical representatives to St. Olavs Hospital in Trondheim, Norway, in November 2007, to view the digital hospital concept firsthand, an experience HP now offers through its European Health Center of Excellence (see next page).

The HP Digital Hospital Initiative brings together diverse technologies to create a real-time health information environment. It enables the transformation from inefficient manual processes and point solutions to more efficient technology-enabled processes by providing a highly available wired and wireless IP network, the convergence of disparate systems onto one network, and a cohesive middleware layer that enables information sharing between those systems.

"One of the first things I noticed was the quiet," says Sylvie Gatién, Assistant Director of Clinical Services at CHUS remarking on her initial reaction to St. Olavs. "The entire hospital has a patient focus, from how they planned the layout of the building to how they move patients around on gurneys to how they deliver services. We were convinced that this is the way to go."

In Sherbrooke, the transformation towards a digital hospital is taking place in steps, beginning with Hôtel-Dieu. The first phase was the installation of a local-area network infrastructure, which is ready to receive WiFi and RFID capability as soon as additional funding becomes available. Next will be the installation of bedside patient terminals, followed by the implementation of several IP-enabled applications such as nurse call and asset tracking.

"We don't want to implement all of the tools at once," notes Gatién, who has put together what she calls a "super user" team to help clinicians adjust to the new working environment. "It's really important that they look beyond the technology and understand that the real goal is to help reduce the pressure they feel every day by ensuring that the right person is at the right place for the right task."

Once the bedside terminals are installed and integration with the existing electronic patient record is complete, additional applications like smart IV pumps will be considered and a digital infrastructure will also be rolled out to the second CHUS site at Fleurimont Hospital.

In the meantime, the journey is a "partnership in progress," says Gauthier. "We're working with HP and its partners to learn as we go," she says, noting that HP will provide the necessary training to ensure the CHUS IT department is ready to support the new WiFi environment.

"We expect to see a substantial gain in productivity from our digital transformation and in the end that should amount to substantial cost savings as well as improved service delivery," she says.

For more information, see Digital Hospital at: www.hp.com/go/transformHLS

Solutions



Digital hospitals in action

If you're considering a digital hospital strategy, a visit to the HP Health Center of Excellence may be just what the 'tech doctor' ordered.

When HP launched its first European Health Center of Excellence (HCoE) in June, 2008, it aimed to do more than just open the doors. The goal was to provide a window to the hospitals of the future and since then, hundreds of visitors have seen firsthand exactly what it means to be state of the art, as well as the benefits that come along with it.

"This is a place where we can demonstrate the value of a digital hospital initiative, dispel the myths, and provide a helpful touch-and-feel experience for customers and prospects," says Roger Morberg, Director, HCoE. "It also serves as a test-bed for exploring new applications of health-care technology, together with our partners," he adds.

Based in Oslo, Norway, the HP Health Center of Excellence represents a collaborative effort by HP, Microsoft Corp., Cisco Systems Inc., mobile communications provider Telenor ASA, and Imatis AS, a leading provider of software for the health-care industry. Designed to mirror the successful digital hospital implementation at St. Olav's Hospital in Trondheim, Norway, it replicates

Tamper-resistant prescription pads 18

A booster shot for health-care documentation 20

Alleviating an identity crisis 21

At the HP Health Center of Excellence, people can interact with all of the components that make up a digital hospital initiative.



a full digital hospital installation, with a 'working' two-bed hospital room, a control room where visitors can view centralized systems and a meeting room.

"People tend to think that a digital hospital is all about entertainment, which it is not," says Morberg. "A digital hospital relies on technology as an integral and fundamental part of its business strategy. It's a transition that requires a holistic approach from senior management supported by a vision for the future that's often difficult to grasp."

That's where HP and its partners are helping. At the HP Health Center of Excellence, people can interact with all of the components that make up a digital hospital initiative, from advanced nurse call systems, unified messaging and IP telephony and network equipment, to wireless IP phones, patient monitoring systems and sophisticated patient terminals that control the lights, access the Internet or even serve as a television. The only thing missing, says Morberg, are the typical smells associated with a hospital environment.

Visits to the center are tailored to customer interests, and are designed to provide education and training. "By demonstrating technology in a real setting, we provide an opportunity to identify workflow challenges upfront," says Morberg. "We facilitate discussions about process change, and show concrete examples where technology has the potential to free up more time for patient care."

The HP Health Center of Excellence concept also includes a research component, which is why HP is currently negotiating to relocate the technology showcase to Akershus University Hospital (AHUS), the second ground-breaking digital hospital to be built in Norway. Moving to a clinical environment will pave the way for further research and innovation, says Morberg, and will give HP, its partners and customers a place to explore new ideas together.

For AHUS, a 550-bed hospital serving 300,000 inhabitants near Oslo, the center will be an opportunity to stay at the leading edge, says CEO Erik Normann. "As a high-tech hospital we like to be out in front and that means we need to be close to our partners who are developing the technology we rely on," says Normann. "I have no doubt that the ideas generated at the center will be the gold standard of the future when it comes to best practices for digital hospital installations."

The central nerve of the AHUS digital hospital implementation is a wireless network with 1,700 base stations. Some of the forward-looking technologies supported by that network include IP phones, bedside patient terminals, smart card authentication and an automated medication dispensing system.

As the hospital continues to evolve its digital strategy, it will be looking to host the center as a "win-win" situation, says Normann. "This is an opportunity to join forces and to really develop something interesting," he says.

For more information on the HP Health Center of Excellence, visit: www.hp.no/HCoE



Tamper-resistant prescription pads are “hard pill to swallow”

Taking advantage of off-the-shelf printers, a new solution delivers ample security features to save costs otherwise spent on specialized prescription pads.

Error and Fraud. These impure words have been indelibly attached to the very pure act of prescribing medicine to patients.

More than 3.5 billion prescriptions are now written annually in the United States, a figure that continues to grow. With volume comes complexity, and with complexity comes a greater number of errors and adverse events. In fact, the Institute of Medicine recently found that more than 1.5 million adverse drug events are preventable each year.

Prescription fraud has also been a mounting issue. People routinely steal or fabricate prescription pads, forge the prescriptions and then seek medication or reimbursement. Roughly 20 percent of prescriptions submitted to the Center of Medicare and Medicaid Services (CMS) are reportedly fraudulent. Not surprisingly, a new law was put into effect in October 2008 that requires all prescriptions submitted to CMS for reimbursement to be written or printed on tamper-resistant paper.

“Tamper-resistant prescription pads are available to meet the new CMS requirements. They’re terrific—until you see the price tag,” says Randy Hickel, Worldwide Healthcare Market Consultant for HP. “Each sheet costs 10 cents on average. Multiply that figure by the amount of prescriptions doled out each year, and

you’ve got a brand new industry.”

A new federal study reveals 46 percent of all prescriptions written in the United States are sent to CMS for reimbursement.* Doing the math as Hickel suggests, it can be quickly determined that the health-care industry may soon be spending more than a hundred million dollars each year on specialized paper alone.

“High volume hospitals write thousands of prescriptions each week,” Hickel explains. “At 10 cents each, the bill can add up real quickly. Pardon the pun, but in today’s economic environment, that’s a hard pill to swallow.”

There’s also the burden of having to lock the specialized pads up in a secure area when not in use. “You can’t just leave a tamper-resistant prescription pad on a desk,” Hickel warns. “They need to be locked up every night and handheld each day. It’s a necessary step, but certainly an onerous one for health-care providers.”

Costly prescription pads avoidable

Here’s the silver lining. Dedicated tamper-resistant prescription pads aren’t necessary to meet the new CMS mandate. Prescriptions can be written or printed on any paper as long as they contain designated security features. Specifically, prescriptions are required to have a minimum of one feature from all three of the



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following CMS categories: copy protection, erasure/modification protection and counterfeit protection. While the law specifies the term “prescription pad,” CMS has stated that these requirements also apply to computer-generated prescriptions that are printed using paper inserted into a printer.

In conjunction with TROY Group, an industry leader in secure on-demand printing technologies, HP has developed a secure prescription printing solution that takes advantage of the HP LaserJet P3005 printer and HP Access Control technology. The solution allows prescriptions with security features above and beyond CMS requirements to be printed on standard paper.

“HP printers have long supported the banking industry and its need for tamper-resistant checks,” notes Hickel, “We’ve taken that technology and adapted it for prescription printing.”

The solution delivers a variety of security features, including microtext, pantographs and specialized toner. A customizable microtext signature line appears blurry when copied but can otherwise be viewed clearly under magnification. One pantograph displays the word “void” when copied. Another offers diagonal, lightly printed text on the front and back of a prescription for further copy resistance. MICR toner leaves a large red stain on the prescription if the paper is ever chemically altered. And with HP Access Control technology, only authorized individuals are able to print the prescriptions.

“This isn’t a solution that’s going to break the bank,” emphasizes Hickel. “It’s an off-the-shelf printer that has been tailored to meet the needs of the health-care industry. And when considering the alternative—forever paying 10 cents for each prescription—the ROI is guaranteed.”

By using an HP LaserJet P3005 printer instead of costly prescription pads, a small physician’s office that writes approximately 15 prescriptions per day will recoup its investment in less than five years. A high volume hospital will recoup its investment in less than five months.

Call it a spoonful of sugar that helps the medicine go down.

For more information, see HP TROY Secure Rx Printing Solution at: www.hp.com/go/transformHLS



A booster shot for health-care documentation

New solution reduces the time and cost of capturing, distributing and storing health-care documents—without a disruptive overhaul of systems and processes.

Like most businesses, health-care organizations are making the transition from paper-based operations to digital operations. With so much paper and an inherent reliance on the information contained within, the transition for the health-care industry has been a slow one.

“Roughly 95 percent of physician offices and 65 percent of hospitals are still paper-based,” estimates Randy Hickel, Worldwide Healthcare Market Consultant for HP. “They’re all moving in the right direction, but for some, the changeover has been more tedious than expected. For others, it’s been a completely ominous and intimidating process.”

As documents are created—for hospital and physician visits, prescriptions, laboratory work, research studies, insurance claims and the like—they are signed, copied, distributed and stored. Distribution and storage frequently extends to several stakeholders, creating multiple redundant steps. And the highly manual nature of these tasks renders them inefficient, time-consuming and costly.

All-inclusive health-care systems are certainly available for purchase, but these are often far too costly and complex; especially for physician offices and hospitals seeking to digitize in a more organic and gradual way than a drastic overhaul of systems and processes.

“There are some great health-care packages on the market, but they can be disproportionate for those wanting simple document capture, distribution and storage as part of their existing processes,” says Hickel. “It doesn’t have to be all or nothing. There are baby steps in between.”

He points to the HP Document Capture for Admissions and Electronic Medical Records solution, which takes advantage of HP multifunction printers (MFPs). The solution simplifies the transition to electronic medical records and helps health-care entities deliver more efficient, reliable and up-to-date care for patients.

“Our MFPs are like a printer, scanner and fax machine all in one,” Hickel explains. “Health-care professionals can create, distribute and store documentation in a single step, from a single device and with minimal disruption to pre-existing processes and IT systems.”

Document capture, bar coding and authentication

The solution is based on three core capabilities: document capture, document bar coding and authentication. Using an HP MFP, health-care organizations can transform patient admissions paperwork, physician’s orders and lab reports into digital documents with a push of a button. The solution supports custom workflow buttons on the MFP so that medical records can be scanned and routed into the appropriate medical record system.

Health-care professionals can also print bar codes with patient metadata on admissions forms and other documents. This aids the ongoing effort of making sure that patient information is consolidated, accurate and private. When documents are scanned with the MFP, the bar code is used to correctly index the documents and automatically route them to the appropriate patient file.

The solution also possesses authentication capabilities to support compliance directives. Only authorized personnel are permitted to interact with the MFP, access documents and route them to the associated medical record, protecting patients’ information and privacy.

“As an alternative to costly, complex, disruptive IT packages for health care, HP Document Capture for Admissions and Electronic Medical Records provides a scalable, easy-to-use solution,” says Hickel. “It’s a great step in moving toward a digital environment and quickly reduces the time and cost of capturing and processing documents.”

For more, see Document Capture for Admissions at: www.hp.com/go/transformHLS

Alleviating an identity crisis

Certified printers produce advanced patient wristbands—with name, barcode, color-coded precautions and color photo—to reduce medical errors, enhance care and improve compliance.

The first question a person should be asked upon entering a hospital or physician's office is not, "What seems to be the problem?" or even, "How can we help you?" The question should always be: "Who are you?"

Delivering the right care, at the right time, to the right patient has profound effects in lowering medical errors. Before this can happen, however, the patient must be accurately identified.

It sounds overly rudimentary. Too logical. Too easy. But the facts state otherwise.

"Research indicates erroneous data is included in more than eight percent of patient wristbands," says Randy Hickel, Worldwide Healthcare Market Consultant for HP, "and nearly six percent of wristbands contain illegible data."

Due in part to such figures, The Joint Commission, a regulatory body that provides hospital accreditation, has made patient identification improvements its number one goal for the past two years. The Commission now mandates a minimum of two forms of positive ID prior to care delivery.

Patient wristbands have become the standard patient identifier system used by caregivers. Yet handwritten labels and blue embossers, also known as blue cards, are still in use today.

"A few providers still do things the old way, but most have made the switch to printed wristbands," notes Hickel. "By and large, these wristbands are black-and-white and contain additional handwritten notes, so medical errors have persisted."

Hickel is a proponent of full color wristbands made possible by select HP LaserJet printers. In addition to a dedicated identification number and barcode that link to a patient's full medical file, these wristbands offer color-coded precautions and alerts (indicating allergies, those at risk of falling, infection/bacteria notices, resuscitation preferences, etc.) as well as a color picture of the patient.

"It's easy to overlook an incorrect number or misread a handwritten note, but a color photo of the patient

leaves little room for error," says Hickel. "Quickly being able to identify a patient and the precautions surrounding his/her care is hugely beneficial, especially when a patient is unconscious or in the event of an IT outage. In the past, doctors and nurses were forced to rely on a confusing mix of wristbands, handwritten notes, patient charts, electronic records and color-coded cautionary markers. It's no surprise that mistakes have been common."

Barcodes that contain valuable patient data can be used as a basis for other solutions designed to reduce errors and improve efficiency. E-prescribing and electronic medication administration applications, for example, require the scanning of a patient wristband barcode and medication barcode prior to dispensing a prescription.

Hickel is quick to point out that health-care providers don't need specialized hardware to take advantage of full color patient wristbands. Several off-the-shelf HP printers—including HP LaserJet 4014, 4015 and 4515 printers and the HP LaserJet 4345 multifunction printer (MFP)—have been certified for sophisticated and customizable patient ID wristbands. By simply loading the recommended wristband media into the HP device and printing from a hospital registration system, a complete patient admissions packet can be produced. Wristbands, privacy notices, consent forms, bar-coded labels and documents for lab work, x-rays or other procedures—all can be printed on one device, at one time.

Unique software is required, but Hickel indicates that most hospitals already have this in place. For others, HP has partnered with FormFast, Standard Register, Optio and other software vendors specializing in health-care forms.

"Positive patient identification is the first and most fundamental step of any caregiver," says Hickel. "By creating reliable and easily readable wristbands, health-care providers can quickly and cost-effectively reduce medical errors, enhance the quality of care and improve compliance."

For more, see Patient Identification Printing Solution at: www.hp.com/go/transformHLS

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