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SPECIAL REPORT

A STEEP CLIMB

Medical Group Leaders Come to Grips With Their Next IT Challenges

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SPECIAL REPORT

DEPARTMENTS

COVER STORY

Medical Group Challenges, Preparing for Disasters, Leveraging Infrastructure

The rapid changes that are transforming the healthcare industry have posed many challenges to medical groups of all sizes. This month's cover story by Editor-in-Chief Mark Hagland, which begins on page 10, is a "virtual roundtable," providing an inside look at how the senior executives of five leading medical groups are working to strategize around issues including accountable care, the patient-centered medical home model, bundled payments, and infrastructure. Their experiences and strategies provide guidance for a common goal: meeting both the demands of their stakeholder groups and the needs of their practicing physicians.

On page 16, Managing Editor John DeGaspari takes a deep dive into an issue that is always topmost on the minds of CIOs: how well-prepared are hospitals to deal with potential disasters. Hospital leaders weigh in by providing the lessons they have learned from their own experiences, which have influenced their views on technology trends, traditional infrastructure issues, and the right formula for disaster preparation.

Beginning on page 22, Senior Contributing Editor David Raths explores how clinical performance measures that are now being designed into EHRs as a data source may lead to systemic improvements in patient safety. His article takes a look at the experiences of four provider organizations whose IT infrastructures already underpin performance improvement strategies.

In this month's Clinical IT Perspective on page 32, Mark Hagland charts the growth in the stature of CMIOs in their organizations, as healthcare trends have intensified the demand for patient care organizations to use clinical and other data to analyze and improve overall effectiveness.

In this issue's Expert's Corner on page 42, Pete Rivera, a consultant manager at Hayes Management Consulting (and a member of *HCI*'s blogging team), explains why it's now time for the healthcare industry to provide EMR support to small physician groups. He presents his case for seamless, cost-effective solutions that could provide a framework of support to get small physician groups on board the EMR train.

Finally, how should CIOs and other hiring managers respond to this question from job candidates: "Why should I want to work for you?" In this month's Career Paths column on page 48, Tim Tolan explains why candor and honesty in explaining your management style to potential employees will eliminate unpleasant surprises down the road.

Have You Heard of Ntsiki Biyela?

HOW AN AWARD-WINNING WINEMAKER'S PERSONAL NARRATIVE OF ACHIEVEMENT SPEAKS TO OUR COMMITMENT TO YOU, OUR READERS

Mark Hagland

Have you heard of Ntsiki Biyela? Unless you are familiar with the world of South African winemaking, or happened to be reading *The New York Times* on August 27, you probably haven't heard of her; in fact, I hadn't heard of her, either. But I did happen to be reading the *Times* online on that date, and so I came across that newspaper's wonderfully inspiring article about how Ms. Biyela, who grew up poor in a small village in South Africa's Kwa-Zulu Natal province, turned an unusual winemaking scholarship to Stellenbosch University, on the other side of that nation in its wine country, into a trailblazing career as one of the first black African winemakers there to win national winemaking prizes.

The *Times* article opens thus: "When Ntsiki Biyela won a winemaking scholarship in 1998, she was certainly a curious choice. She had grown up in the undulating hills of Zululand, living in a small village of huts and shacks. People tend their patches of pumpkins and corn. The only alcohol they drank was homemade beer, a malt-fed brew that bubbled in old pots. Indeed, Ms. Biyela had never even tasted wine, nor had anyone she knew."

As the article goes on to explain, not only is Ms. Biyela talented and hardworking, she also made a series of personal cultural leaps in order to move forward in the nearly all-white, culturally European wine world, and to come to excel at the craft that destiny seems to have chosen for her. To her credit and to the astonishment of many, Ms. Biyela's very first red wine blend won a gold medal at the country's prestigious Michelangelo awards. Later, she was named South Africa's Woman Winemaker of the Year in 2009. In the end, she proved to everyone the wisdom of those who had facilitated her career by providing her initial university scholarship.

I found much to relate to in Ntsiki Biyela's story. A journalist for nearly 30 years now and a healthcare journalist for 22 years, I am always strongly aware of the fact that, as someone who is neither an informaticist nor a clinician by background, my editorial authority derives from whatever strengths I can bring to my job as a seasoned and conscientious journalist. And that awareness always keeps me humble and deeply conscious of my responsibility to maintain only the very highest standards of editorial integrity and responsibility at *Healthcare Informatics*, and to make certain that our publication's coverage is always carefully balanced and truly serves the objective needs of its readers. In that dedication and purposefulness, I am joined by the other members of our outstanding editorial team.

And in that regard, it has been highly gratifying for our team to have received a number of national awards in recent years, and to regularly receive sincere compliments on our coverage from our readers and from industry experts. Like our colleagues at the other six healthcare periodicals published by our parent company, Vendome Group LLC, we are journalists by background, not healthcare practitioners or clinicians. That fact only intensifies our commitment to adhere to the highest standards in journalism. We all take very seriously the responsibility we've been given along with the wonderful opportunity to cover the industry for you.

And, like Ntsiki Biyela, I will always be conscious of, and honor, the special opportunity I've been given, by continuing to work with our team members to bring to you only the very highest-quality reporting analysis on our website and in our print magazine. It's what you—and all healthcare stakeholders—need, and have a right to demand.

Mark Hagland
Editor-in-Chief

MANY MOUNTAINS TO CLIMB

SPECIAL REPORT

MEDICAL GROUP LEADERS FACE A BROAD RANGE OF STRATEGIC IT ISSUES GOING FORWARD BY MARK HAGLAND

EXECUTIVE SUMMARY:

Medical groups of all types and sizes stand collectively at a crossroads in the evolution of the healthcare industry in the United States at this point in time. Faced with a welter of issues, from reimbursement concerns to mandates coming out of federal healthcare reform and the American Recovery and Reinvestment/Health Information Technology for Economic and Clinical Health (ARRA-HITECH) Act and other legislative and regulatory developments, and competing to better serve the needs of both patients and payers and purchasers, the CEOs, CIOs, and others leading physician groups are working assiduously to find ways forward that meet the demands of stakeholder groups while also meeting the needs of their practicing physicians.

In order to get a sense of where the leaders in the field are at this point in time, Healthcare Informatics *Editor-in-Chief Mark Hagland gathered together several leaders of pioneering medical groups nationwide through a "virtual roundtable" process late this summer, in which he interviewed successive leaders and "shared forward" their thoughts with the others around this "virtual roundtable." Below are excerpts from the progressive interviews. Capsule profiles of the leaders and their organizations can be found below.*

Among the many issues facing these leaders: how to plan for the development of accountable care organizations (ACOs), the patient-centered medical home model, bundled payments, and other federal policy requirements; how to make progress towards meaningful use, under the HITECH Act; how to plan for ongoing infrastructure, interoperability, and mobility development; and how to prioritize a variety of disparate efforts aimed at fulfilling different types of needs. No one medical group leader has all the answers; but our panel of leaders certainly has many important and useful perspectives to share.

PARTICIPANTS

Mark Shields, M.D.
V.P., Advocate Health Care, and Sr. Medical Director, Advocate Physician Partners, Mt. Prospect, Ill.
3,900 physicians across N.E. Illinois, affiliated with Advocate Health Care

Tina Buop
CIO, Muir Medical Group IPA Walnut Creek, Calif.
700 M.D.s across three counties in Northern California

Craig Lanway
CIO, Hill Physicians Medical Group San Ramon, Calif.
2,600 M.D.s across several counties in Northern California

Tim Terrell
CIO, Cornerstone Health Care High Point, N.C.
200 M.D.s across 75 sites in the Winston-Salem/Greensboro/High Point Triad region of North Carolina

James L. "Larry" Holly, M.D.
CEO, Southeast Texas Medical Associates (SETMA) Beaumont, Texas
32 physicians in Southeast Texas

*H*ealthcare Informatics: What are the most important, urgent strategic IT challenges facing you right now?

Tina Buop: I really think there are four top components involved, and they're all equally competitive with one another. The first is developing a strategic approach to identifying and implementing quality metrics, such as those required for meaningful use, those that have already been required for pay for performance, those required for evidence-based care, and those required for CMS Star [a program created under federal healthcare reform and administered by the federal Centers for Medicare and Medicaid Services (CMS) that pays Medicare Advantage health plans differentially according to their beneficiaries' experience of care and quality of care].

There are also accountable care organization metrics; there are existing PQRI [the federal Physician Quality Reporting System, still referred to as the Physician Quality Reporting Initiative across the industry] metrics; and then there are metrics to measure against compliance, such as the [federal] e-prescribing cutoff that happened in June. And in 2012,

there will be 1-percent penalties under Medicare—and though it's not a quality metric per se, it's a compliance metric in that case.

HCI: That's a lot of items to think about at once.

Buop: It's daunting. Then you look at our core menu of measure sets for meaningful use, and the existing pay-for-performance metrics, and there is then the challenge of creating a crosswalk between those two areas. With all these different metrics, we could customize them to our hearts' content, but then you'd lose hundreds of thousands of dollars on each customization, because

WITH ALL THESE DIFFERENT METRICS, WE COULD CUSTOMIZE THEM TO OUR HEARTS' CONTENT, BUT THEN YOU'D LOSE HUNDREDS OF THOUSANDS OF DOLLARS ON EACH CUSTOMIZATION, BECAUSE OF THE DATA FEEDS, ETC., FOR EACH MEASURE. —*TINA BUOP*

of the data feeds, etc., for each measure. For example, if our organization chose to customize a hemoglobin A1C measure, we would have to customize all our reports in that area, and doing so would make the task of maintaining the system daunting.

HCI: What are the top issues for you at Hill Physicians Medical Group?

Craig Lanway: My to-do list keeps growing. And healthcare reform is changing the whole landscape. I wouldn't say that anyone at Hill completely understands this thing or how it will turn out; but I will

ing firm for the past five or six months on a plan for an overall care management strategy, because that's our business now. We are now moving into the realm of care management. And who is better-positioned than medical groups to manage the care of patients? It's not hospitals; it's medical groups. At the same time, we have to take care of some mundane things, like the transition to ICD-10; that's got to be completed. We've also got to continue to get physicians to adopt EMRs in their practice.

HCI: You still have a large percentage of physicians who are not yet fully electronic. How does that figure into your care management strategy?

Lanway: It figures in very strongly, because we still have a large number of very small physician practices that are working off paper. And only 20 percent of our patients are seen by PCPs who are using an EHR. And we've got a long way to complete that rollout. So we have a two-part strategy right now. One option is to do a full NextGen implementation [with Hill's core EHR vendor, the Horsham, Pa.-based NextGen Healthcare]; the other is an EHR "lite." And we're still working on defining that second offering.

WE'RE GOING TO HAVE TO SHIFT SOME OF OUR CORE COMPETENCIES AWAY FROM HARDWARE AND SYSTEMS AND TOWARDS EXPANDING OUR CONCEPT OF WHAT A NETWORK IS, AND TOWARDS A LOT MORE DATA INTEGRATION, AND DATA DELIVERY IN THE RIGHT PLACE AT THE RIGHT TIME. —*TIM TERRELL*

say that what we've been doing at Hill for years in terms of managing care in terms of cost and quality is where we think healthcare reform is going. Certainly, California has had a lot of experience with that. You're familiar with the ACO-type arrangement we've already created in California, and we realize that we have to have flexibility for new arrangements.

So we've been working with a consult-

We've started that process now.

HCI: What about at Cornerstone Health Care?

Tim Terrell: I'd put it like this: our immediate issues have to do with meaningful use and getting the stimulus money. But bigger than that is looking at healthcare reform, as well as industry consolidation, the big trend towards consumerism and consumer engagement, and the whole

cloud computing trend. We're seeing that we're going to have to shift some of our core competencies away from hardware and systems and towards expanding our concept of what a network is, and towards a lot more data integration, and data delivery in the right place at the right time.

HCI: But that implies a strong data infrastructure to support all this new flexibility, correct?

Terrell: Correct. The difference, I think, is that for groups like ours, we're seeing this incredible growth in complexity in the systems environment, and it's hard for groups our size to keep up with that, and these new technologies such as cloud computing are coming along that will simplify things on our end—and that's very, very attractive for us. And another thing is that cloud could take some of the administrative burdens off us.

HCI: What kinds of data capture, data collection, and data sharing issues do you and your colleagues face?

Terrell: With healthcare reform, we're looking at integrating a tremendous amount of data across the community. There's all this talk of health information exchanges, and all of that may help a lot; still, our biggest challenge is not connecting across the entire state, but across our community. With the healthcare reform situation, someone is going to have to be the data integrator for individual communities, and we'd like to be that for our community, and we're going to have to learn how to be that in a rapid fashion.

There are all sorts of different tools, too. Everybody's looking at the electronic medical record as the tool, but that may not be the tool that's going to help you do population health management. It will certainly be a part of the solution, but it may not take you to that next level.

HCI: What about at SETMA, where you've focused so intensively on care management and population health management?

James L. "Larry" Holly, M.D.: An increas-

ingly important element for us is clinical decision support (CDS) to support performance improvement continuing medical education, or "PICME." [Editor's note: PICME involves a feedback loop between a CME-granting organization and an individual physician, assessing that physician's current practice with regard to his or her using evidence-based performance measures, and providing feedback to that physician through the benchmarking of his/her scores against

Framingham risk calculators [calculations around cardiovascular risk, from the six-decades-old Framingham Heart Study] for each of their patients. We now do all 12. These kinds of efforts are now central to our work. And we've created additional dimensions, involving our patients' participation. Automation is central to such work.

The second biggest element is that, as the stress on physicians increases, they're going to be looking for safe havens, for

million so far on IT infrastructure; and they won't have to spend a penny on that infrastructure. But we want their minds and hearts engaged in this; and finding those people, rather than just people who want someone to solve their problems, that's another huge problem.

HCI: Dr. Shields, as the leader of a bridge group between physicians and a multi-hospital system, what are your most important issues and priorities around leveraging IT strategically?

ONE OF THE BIGGEST CHALLENGES WILL BE HOW TO INTEGRATE THOSE PEOPLE INTO AN OPTIMALLY FUNCTIONING ORGANIZATION, AS COLLABORATORS RATHER THAN JUST COOPERATORS. —*JAMES L. HOLLY, M.D.*

those of peers.] So CDS to support PICME and transformational processes in the ambulatory care environment, to me, is one of the most important things to do. When we take a complex thing and reduce it to a one-second task, to me, that is worth doing.

And the AAFP [American Academy of Family Physicians] said back in August 2010 that every family physician should every five years calculate one of the 12

opportunities to join or merge with an organization that already has solved the problems around things like billing, ICD-10 coding, SNOMED nomenclature, EHR adoption, etc. One of the biggest challenges will be how to integrate those people into an optimally functioning organization, as collaborators rather than just cooperators.

We're in conversations with a number of physicians. And we've spent nearly $7

Mark C. Shields, M.D.: The major ones we're faced with involve our positioning ourselves for value-based payment systems; and we have a long history at Advocate Physician Partners with our clinical integration program. Advocate has 12 hospitals in northern Illinois, and also owns a home care agency, and has 900 physicians in salaried positions. Meanwhile, Advocate Physician Partners is a joint venture between Advocate and 3,900 doctors, with 3,000 of them in private practice.

We have for over seven years done a clinical integration program, to drive

Association Viewpoint: An Interview with MGMA's Robert Tennant

Robert Tennant

Robert Tennant, senior policy advisor in the Washington, D.C., office of the Englewood, Colo.-based Medical Group Management Association (MGMA), spearheads his association's responses to a very broad range of policy issues and developments. At a time of tremendous change and tumult in healthcare and in the medical group world in particular, Tennant and his colleagues are strongly focused on representing their members' interests to policy leaders in Washington and in the state capitols. Tennant spoke recently with *HCI* Editor-in-Chief Mark Hagland regarding the challenges and opportunities currently facing MGMA members. Below are excerpts from that interview.

Healthcare Informatics: What seem to be some of the biggest challenges for your member groups around meaningful use right now?

Robert Tennant: What's interesting is that the proposal for Stage 1 of meaningful use included two of the administrative transactions, the electronic claim, and electronic eligibility verification. We pushed back against that, because we argued that those administrative transactions were conducted through the practice management system, not the EHR, and that that would essentially force medical groups to get practice management systems certified. So those two requirements were stripped out of the final rule for Stage 1, but kept in Stage 2 as placeholders. So we've asked again that they review that. But at ONC [Office of the National Coordinator for Health IT], they're looking to drive a lot of policy through meaningful use, everything from privacy and security to electronic administrative processes. Their hearts are in the right place, but that's not what Congress intended.

In fact, CMS has only disbursed incentive monies into about the mid-200 millions of dollars at this point; they clearly aren't giving out the money at the pace that had been expected. One reason is that the criteria in Stage 1 are very challenging. What we've seen is that folks who have achieved meaningful use and have attested so far, were already frontrunners in the industry, early adopters. So the question is, once this sort of blip dies down, how will practices that haven't adopted EHRs, get on this train? And our argument to ONC and CMS has been, don't make moving forward on MU so difficult that it disincents medical practices.

It speaks to such simple things as how you register and attest. They did allow for the designation of a proxy, but doing so is complicated. So we've asked for something simple; if the physician has reassigned his or her benefits through Medicare through PECOS [the Internet-based Provider Enrollment, Chain and Ownership System from CMS], just allow the administrator to do all the attesting for the group. So again, make the infrastructure more streamlined, and eliminate one more barrier to participation in the program.

HCI: Are you hearing from your membership that meaningful use is difficult for them?

Tennant: Yes. The frontrunners have had some time to move forward in areas now covered by meaningful use. But some of the criteria are more challenging than others; there are questions about providing a care summary to your patients, for example, when some patients frankly don't want it; the same goes for e-prescribing and patient participation. And issues like that can create logistical problems with fulfilling some of the MU requirements.

HCI: At an even more basic level, ONC has not even formally recognized medical groups as an entity under MU.

Tennant: That's right. We've asked for a group reporting option, because groups act as a unit. If you have a group of 150 physicians, and you have to require them to all go into a website in a specific way, it really defeats the purpose of having a medical group.

HCI: Is ONC listening?

Tennant: In fact, we had a call with them [late this summer], and they said, yes, we've heard you, and we're in discussions about this. So as they say in Washington, I'm cautiously optimistic. Part of the impetus of that change will be the relatively slow outlay of monies under meaningful use. So if that pace of outlay is not moving forward as expected, that may encourage them to streamline things somewhat.

quality, patient safety, and cost-effectiveness across our network. And because of that, we are able to jointly negotiate with commercial carriers; and we have contracts with all the commercial payers in the northern Illinois market. We feel this provides a good base for value-based care delivery. We're actively looking at the Medicare accountable care program; and we're already engaged with an ACO-type

program with Blue Cross Blue Shield of Illinois [BCBSI], which went live on January 1 of this year. So we feel we have a good base for these value-based contracts; but we are actively enhancing our IT to do a better job in these areas. And we're doing it in two ways. We've accelerated the rollout of our EHR among our independent doctors; about 250 are live now, whereas 90 percent of our owned practices are on

the EHR.

HCI: How quickly will your remaining non-automated private-practice physicians go live?

Shields: We have hired 30 full-time employees to help us supplement what the vendor provides; and we think that we can probably do about 250 physicians a year. So it will take several more years at the current rate. We are currently doing it on a voluntary

basis, while addressing the question of whether we should mandate EHR implementation for participation in our network. Doing so would enormously accelerate the pace of adoption across our network. The answer depends on

sources—claims, pharmacy, lab, into those sources. We use a lot of analytics, based on claims and pharmacy data, to profile our physicians, and feed information back to them. We've instituted 70 full-time outpatient care

record; and in fact, the electronic health records, as currently deployed, don't accomplish a lot of what I've just described. So to think that an EHR is the Holy Grail for accountable care and value-based purchasing is incorrect; you have to implement a lot of other tools.

WE USE A LOT OF ANALYTICS, BASED ON CLAIMS AND PHARMACY DATA, TO PROFILE OUR PHYSICIANS, AND FEED INFORMATION BACK TO THEM. WE'VE INSTITUTED 70 FULL-TIME OUTPATIENT CARE MANAGERS, WHO ASSIST WITH THE MOST EXPENSIVE 2 TO 3 PERCENT OF PATIENTS. —*MARK SHIELDS, M.D.*

whether we decide to move ahead with an accountable care program; and if we do in fact do so, we would likely make EHR implementation mandatory.

HCI: Would you agree that it's too difficult to really do accountable care or value-based contracting without a live EHR?

Shields: I wouldn't agree, because we are actively pursuing that program with BCBSI; we have disease registries for both chronic conditions and wellness, and those are real-time, web-based tools with information for doctors coming from multiple

managers, who assist with the most expensive 2 to 3 percent of patients.

In fact, we've implemented an electronic care management tool for our nurse care managers, which helps them target high-risk patients and then provide prompts and reminders for the care of those patients, as well as counseling for them. And we have an online referral management system that has protocols that drive care decision-making, for pharmaceuticals, for imaging, for other expensive interventions. So we have a lot of electronic tools that are not an electronic health

HCI: Craig Lanway, you've been very pioneering in areas around care management and quality improvement, but on the IT side, there's fundamentally no shortcut to any of this, right?

Lanway: Yes, that's right. It's not as though the hospital has a contractual obligation to provide health information exchange. And we're interacting with organizations that don't have financial obligations to us. So it really relies on trust and shared vision; without those, this isn't going to happen.

HCI: Thank you all very much for sharing your information, insights, and perspectives with our readers, your peers. We look forward to providing our readers with updates on your progress in all these areas. ◆

Staying on Your Feet

CIOs PONDER THE RIGHT FORMULA FOR DISASTER PREPARATION IN THE NEW HEALTHCARE IT WORLD BY JOHN DEGASPARI

EXECUTIVE SUMMARY:

CIOs are hard at work coming up with the most effective and affordable strategies for protecting electronic data as their hospitals move forward on electronic medical records. While the rise of cloud computing and declining network costs are offering new opportunities in dealing with potential disasters, many find there is no substitute for good planning and constant testing.

Ask any hospital CIO what keeps him or her up at night, and chances are that disaster preparedness ranks high on their lists. In fact, as this issue was about to go to press, Hurricane Irene roared up the Eastern Seaboard, causing massive flooding in coastal cities and towns from the Carolinas to Maine. As if to underline the seriousness of the threat, New York City officials took the unprecedented step of shutting down that city's mass transit system and ordering the evacuation of four major hospitals that were located in flood areas.

To be sure, hospitals across the country are facing serious financial pressures as they push forward on meeting meaningful use benchmarks under the American Recovery and Reinvestment Act/Health Information Technology for Economic and Clinical Health (ARRA-HITECH) Act. Yet despite their tight budgets, CIOs in-

Computer monitors stacked in the parking lot of Columbus Regional Hospital that were removed from the flooded building. Photo: Columbus Regional Hospital

terviewed for this article also indicate that they have gone to great lengths to make sure that they have plans in place that will help hospitals continue to function if disaster strikes.

Not least, a catastrophic failure could threaten the progress that hospitals have already made toward clinical decision support and instant access to clinical information that electronic health records have made possible, notes Charles E. Christian,

CIO of Good Samaritan Hospital, Vincennes, Ind. As the CIO of a county hospital in a rural area, he says it's essential to have a good handle on what the hospital needs and what it can afford. "It's like an insurance premium to make sure you can move your back-up tapes and get those taken care of," he says.

He compares disaster recovery planning to Y2K planning at the end of the last century. "We did all of the remediation and Y2K was a non-event. It's the same type of planning we have with disaster recovery and business continuity planning. We want to make sure that nothing happens," he says.

A look at the strategies that hospitals are pursuing reveals that they are often an interesting mix of current IT trends, such as the cloud, and traditional brick-and-mortar issues.

SPREADING THE RISK

Chuck Podesta, senior vice president and CIO of Fletcher Allen Health Care, Burlington, Vt., views disaster recovery as a life safety issue, similar to certain types of medical equipment that need to be maintained. Virtualization, network redundancy, multiple data centers, and the cloud all figure in preparation. "You are spreading your data over multiple geographic areas, which is part of the high availability strategy, and is extremely important these days to look at," he says.

The key challenge for each CIO is the need to assess the risk that their hospital faces and coming up with a plan that is appropriate to that level of risk, according to Russell P. Branzell, vice president and CIO of Poudre Valley Health System in Fort Collins, Colo. "Are you really in an area that is highly prone to disaster, and are you able to take the action that is appropriate to the level of risk?"

His hospital's disaster recovery process "is not something that collects dust on a shelf for me as a CIO," Branzell says. "I get a new binder every year from my security and technical team; they've gone through the process for disaster recovery, and then I put recovery audit in every two years. It gives me the confidence that I have a fighting chance if something bad was to happen."

Although Poudre Valley does not have truly mirrored sites—an arrangement in which every piece of data is continuously and fully replicated—it

does have basic functionality for business continuity, with good backup procedures and de-duplication processes in place. Data is stored on-site at a secure location, Branzell says.

DISASTERS LARGE AND SMALL

Despite the best of precautions, no hos-

WE DID NOT CONTRACT OUT IMPLEMENTATIONS OR TECHNICAL SUPPORT. WE KEPT THE KNOWLEDGE AT COLUMBUS REGIONAL. —*DIANA BOYER, R.N.*

pital can completely eliminate the possibility of a failure, usually unexpected, and sometimes resulting from an unlikely daisy-chain of events. At Good Samaritan recently, a transfer switch failed in the power room. During the repair operation, the uninterruptable power supply (UPS) that was providing backup power also failed. This disrupted power to the DNS servers that handled directory information for all of the applications, which then could not connect with the databases, which could not get to the storage area network. "We spent hours recovering that, and we were up in three hours," Christian says, adding that the IT team also had to check to make sure that the databases were not corrupted.

Christian points to that as an example of how a relatively minor repair in the data center was quickly able to spiral out of control. But he also cautions that potential catastrophes can just as easily be mundane. "When you start talking about disaster recovery, it's much more than what happens in the data center; it's a facility thing," he says. Good Samaritan Hospital, which is located on a 100-year flood plain, has embarked on a new building program, and will be vacating a tower. The IT

department will relocate from its current location, known as The Pit because it is the lowest point in the facility—to the third floor of the old tower, well above the flood plain.

Diana Boyer, R.N., vice president and CIO of Columbus Regional Hospital, located in Columbus, Ind., about 45 miles south of Indianapolis, would agree. In June of 2008, the Columbus area experienced 11 inches of rain in a very short period of time, causing a small nearby stream to swell so rapidly that it resulted in a flash flood.

In just 45 minutes, the stream overflowed its banks and spilled into the hospital parking lot, making its way toward the hospital basement that housed the data center, electrical switches, laboratory, food services, pharmacy, and other core services. The water reached the below-grade loading dock, which acted as a funnel that flooded the 160,000-square-foot basement in less than an hour. The flood submerged the electrical switches, causing the hospital to lose power, and then began to bubble up to the 140,000

Aerial view of flooding around Columbus Regional Hospital.
Photo: Columbus Regional Hospital

square-foot main floor, putting the radiology department and ED out of commission. The hospital staff successfully evacuated the hospital's 157 patients without injuries, Boyer says.

Boyer was home and couldn't get to the hospital. She called her staff at 4 p.m. and was told everything was fine; but by 5:30, the hospital had shut down. Estimated damages were close to $200 million and closure was estimated for 12 to 18 months.

In the January prior to the flood, Columbus Regional had acquired a data center three miles away, and was in the process of installing redundant systems off site, which until then existed in the original data center that was now under water. The original data center also housed two storage area networks, one of which was to be moved to the new data center; and plans were to install a second uninterruptable power supply and backup generator. None of the installations were completed before the flood, Boyer says.

The original data center was destroyed in short order, with its equipment immersed in creek water, mud, corn stalks from local fields, reagents from the submerged lab, and other contaminants that made the computer drives useless. Fortunately, the hospital kept tape backups of data at another location in Indianapolis, so there was minimal data loss, Boyer says. The flood destroyed the hospital's phone system, forcing the staff to rely on cell phones.

Remarkably, Columbus Regional was operational less than five months after the flood. The Carolinas MED-1 mobile emergency department unit arrived June 23. MED-1 provided emergency care for the area until the hospital opened the ED in the main building on Aug. 1. On Oct. 27, it re-opened patient care ser-

Clinical Risk Modeling
The Heartbeat Of Appropriate Use Criteria

Medical societies are becoming more open to self scrutiny and are establishing criteria for the appropriate use of their treatments. Furthermore, the federal government and private health insurers seek to contain costs around big ticket medical treatment & technology. For example, the increasing prevalence of coronary artery disease (CAD) and the costs of revascularization procedures have resulted in heightened interest among clinicians, payers, and patients as to the appropriateness of percutaneous coronary intervention (PCI). While it is likely that PCI may improve patients' outcomes in the majority of cases, it is important to recognize that inappropriate use is not only potentially harmful to patients but can generate unwarranted costs to healthcare systems.

Developed by the American College of Cardiology (ACC), Society for Cardiovascular Angiography and Interventions, Society of Thoracic Surgeons, American Heart Association (AHA), and other national societies, the *Appropriate Use Criteria* for Coronary Revascularization is the result of an unprecedented collaborative effort to help ensure higher quality cardiovascular care by providing the first ever basis for evaluating clinical decision making.

Based upon clinical trial evidence, guidelines, expert opinion and a consensus building process, a Technical Panel of clinical experts considered ~200 prototypical patient scenarios and rated their appropriateness for revascularization. From these, algorithms were developed, implemented, and applied to the ACC's CathPCI Registry data.

What is an Appropriate Use Rating?
A scoring system developed to serve as a supplement to current ACC/AHA guidelines that takes into account specific patient characteristics and categorizes procedures as appropriate, inappropriate, or uncertain.

Kansas City - based Health Outcomes Sciences, in collaboration with the ACC, offers a unique solution to apply the *Appropriate Use Model* to individual patients at the point of care. Through the company's **ePRISM®** product, which enables complex risk models to be used to better identify patients' risks and benefits from treatments, evidence-based medicine can now be delivered on a patient-by-patient basis to support and improve care.

John A. Spertus M.D.
Founder, Health Outcomes Sciences

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vices, including surgery. Actual damages totaled $171 million.

Today the hospital's primary data center is housed in the new facility three miles off site, and the secondary data center is located on the first floor of the main hospital. The electrical switches have been moved out of the basement, as have the pharmacy and laboratory, which are now on the hospital's main floor.

Boyer places a lot of value on the hospital's expert IT staff, which was hired in 1997 to develop the IT department as part of the hospital's strategic IS plan. "We did not contract out implementations or technical support. We kept the knowledge here at Columbus Regional," she says. "We had a very structured

to Kansas City-based Cerner Corp. from its current vendor next summer. (The hospital will continue to host its own PACS and financial system.) Boyer says she is comfortable with the decision, noting that the hospital has successfully hosted its lab system remotely with Cerner for six years. Financially, remote hosting makes sense, saving the hospital the costs of buying and maintaining its own hardware and maintaining an Oracle database, she says.

The decision is part of a trend in which cloud providers, application service providers, and other third-party relationships are becoming an increasingly important partner with hospital IT departments when it comes to storing and processing data and housing hardware.

them go away," he says.

That's not to say that the trend does not bring its own concerns. Every healthcare data center in the country has some single point of failure, Branzell says. In his own experience, he realized that Poudre Valley had dual grid power, both going through the same switch. "No matter what you do, there is some place where you have got something goofy, where you have got a single point of failure," Branzell says.

Single point of failure is becoming increasingly important as more solutions become cloud-based or application specific provider- (ASP) based, Branzell says. "If all of my transcription services are done in Boston via a cloud solution or a Web solution, and I can't get to that, how do I do my transcription?" he asks. That concern has led him to seek lower bandwidth alternative paths to its Internet service provider that can be used as a failover. Poudre Valley's imaging is an ASP-based solution through Phillips; however, it also stores 90 days worth of images locally, as a backup.

TRADITIONAL DATA CENTERS ARE GOING TO START TO HAVE A MUCH SMALLER FOOTPRINT THAN THEY DO TODAY, AND WE ARE GOING TO START TO SEE THEM GO AWAY. —RUSSELL P. BRANZELL

methodology on how we implemented systems; designing, building, testing and training; and how we keep it. Good relationships with vendors also were important," she says.

Just prior to the flood, Columbus Regional participated in a multi-county disaster recovery drill based on a potential terrorism incident. The hospital is now expanding on the command center model that was developed then. One of the biggest lessons of the flood had to do with the role reversal: hospitals traditionally receive disaster victims, but are not usually victims themselves. "That was a huge turnaround for us," she says.

REACHING UP TO THE CLOUD

Interestingly, even though Columbus Regional has successfully completed and relocated its new data centers, which it operates, it plans to move to remote hosting of its electronic health record (EHR) system when the hospital moves

Case in point: Good Samaritan is a member of the Indiana Network for Patient Care (INPC) in Indianapolis, part of a service for the Indiana Health Information Exchange that acts as a repository for clinical information. When an HL7 registration for a new patient hits the INPC server, it returns clinical histories for each individual patient, providing the physician with the patient's history. Christian says Good Samaritan is now planning on using the service as a disaster recovery tool, which he describes as a secondary on-line ready access to the EMR. "We are already paying for the service, so we can add value to that expense by providing access to a clinical record in case we have a failure," he says.

Poudre Valley's Branzell believes the cloud is going to be a game-changer for the entire applications market. "Traditional data centers are going to start to have a much smaller footprint than they do today, and we are going to start to see

Bruce Smith, senior vice president and CIO of Advocate Health Care, Oak Brook, Ill., notes that the IT environment has become extremely complex over the last 30 years. In October 2009 the organization was evaluating a hardware and software upgrade that was going to cost in the $20 million range, and decided to contract with Cerner's cloud services, including its main EMR, physician order entry, clinical information retrieval, laboratory results and radiology results, and disaster recovery. "All clinical information for inpatient, outpatient, and the ED is maintained through this system," he says. Advocate still maintains some systems separately, including registration and billing, as well as the EMR for

its physician group and independent physician offices.

Smith says the decision to use the cloud was based on a combination of business issues, and the timing of the upgrade was one of the deciding factors in deciding to use Cerner's cloud service. "We asked ourselves if we really wanted to make this hardware investment that we would have to replenish in 10 years, or just bundle the stuff into an agreement," he says. The hardware covered in the agreement includes a Citrix server farm, which Smith says is difficult to maintain, and a secure state-of-the-art data center that is protected against class 6 tornados. Cerner's two data centers are located 20 miles apart in the Kansas City area, one for primary use and the other providing backup.

When Smith felt the hospital had a good basic outsourcing agreement, he got into specifics of disaster recovery. The agreement includes redundancy, but not full redundancy, in which the standby environment would provide immediate backup. "If we have a problem with our main database and processing, we would do a switchover, which is guaranteed to be up in four hours," he says. Full redundancy with immediate switchover would be significantly more expensive, although going that route is a possibility in the future, he says.

"The most critical data is the clinical data physicians use to treat their patients," Smith says. "We put a lot of effort into making sure that the front-end connection is reliable and works well, and that has been the case." In addition, Smith says, Advocate has a number of communication pipelines connecting the data centers to the Chicago area, where the hospital is located, so if there is a problem with one of the communication links, it will fail to another. "We have complete redundancy in data communication from here to Kansas City," he says.

Fletcher Allen, whose EHR is from Epic Systems Corp., Verona, Wis., operates three data centers. "We built in redundancy by doing a lot of shadowing of data across the data centers," Podesta says. He says running one's own data center is "very expensive. Keeping the network up to date and managing that takes up a good piece of the annual budget."

He says transferring that responsibility to third-party vendors is a possibility in the future, especially considering the escalating costs of cooling, electricity and maintenance of the space itself. It is a possibility that he looks at each year at budget time. "In the past, technology has not been up to snuff, and the bandwidth you would need to do that would be very costly," Podesta says. "But all of that is coming down now; the price of hardware, storage, and the networks themselves, and you can get a lot of bandwidth at a lower cost than in the past." In his view, cloud-based EHRs will begin to become more common in three to five years as the technology becomes more robust and vendors become more focused on it.

Not everyone is convinced that the cloud has enough of a track record for hospital CIOs to give up direct control of their data centers. Steve Duch, director of IS business development at Memorial Sloan-Kettering Cancer Center in Manhattan, says that "the cloud has not yet been tested in the event of an actual major disaster."

While the question of how big a role the cloud will play in disaster recovery plans remains open to debate, it's clear that progress toward electronic health records is both offering hospitals new tools and exposing them to new and different vulnerabilities in addition to longstanding natural threats. ◆

Infrastructure for Improvement

FOUR HEALTH PROVIDER ORGANIZATIONS ARE LEVERAGING CLINICAL INFORMATICS SYSTEMS FOR BETTER PERFORMANCE AND IMPROVED PATIENT SAFETY BY DAVID RATHS

EXECUTIVE SUMMARY:

The fact that many clinical performance measures are now being designed with EHRs as their data source may lead to systemic improvements in patient safety. Healthcare Informatics *looks at four healthcare providers whose IT infrastructures already underpin their performance improvement strategies.*

Most healthcare organizations focusing on performance improvement have traditionally faced some trouble getting buy-in from clinicians. In many cases this was because reports were based on 6-month-old data from chart abstractions, which were partial, random, and sometimes inaccurate.

As more healthcare data becomes electronic, clinical informatics teams have begun extracting data from transactional electronic health records (EHRs) into data warehouses, where it can be normalized and reported on much more rapidly. "In a lot of settings, quality improvement has been embedded for 20 years, but by pulling information from EHRs, you can get a much broader population view and more timely data," says Carole B. Black, M.D., who oversees clinical development for Chicago-based Valence Health, a solutions and consulting firm that helps healthcare organizations measure quality care and outcomes.

EHRs tend not to do a good job of this reporting, says Elizabeth Simp-

kin, Valence Health's vice president of consulting services. "EHR vendors are working on improving in that area, so I would argue that the time you might
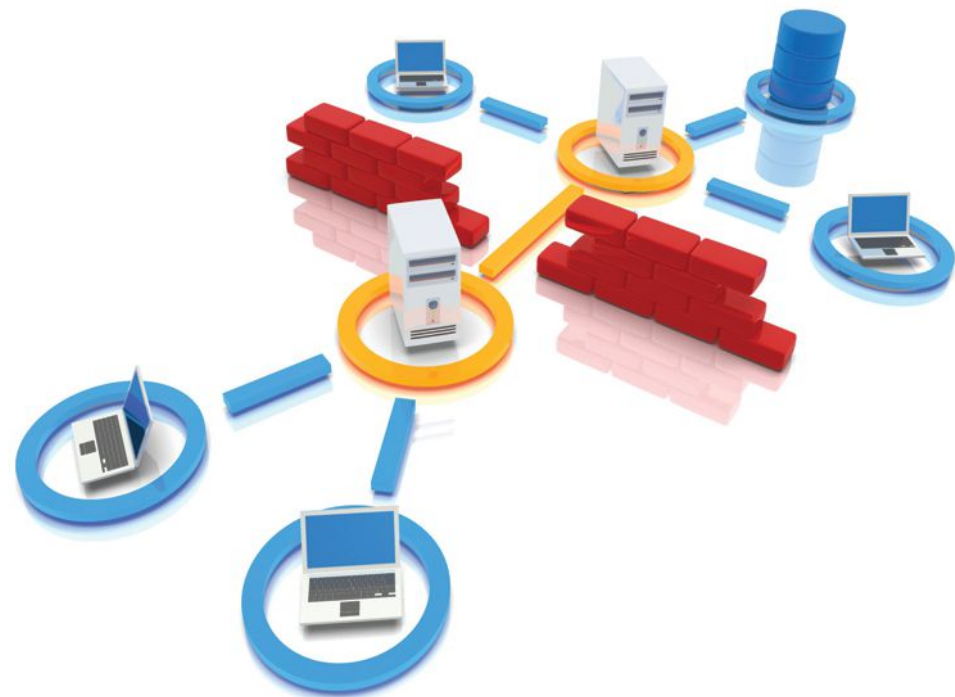
need help with a data warehouse is now. Even if hospitals have ways to get data from their own systems, they now need to extract it from multiple sources."

Where organizations are gaining the most benefit is using EHRs for population-level reporting, Simkin adds, by extracting data from a variety of EHRs in use and then synthesizing it to provide a comprehensive view of a patient across service providers. "The larger integrated delivery networks and multispecialty groups have spent more time thinking about the population level," Black says, "but so far other providers have spent more thinking about the patient right in front of them. It is a different mindset."

Healthcare Informatics recently spoke with leaders of four healthcare system initiatives about how their IT infrastructure and strategy underpin their performance improvement strategies and about some of the improvement gains they are already seeing.

EHRs DESIGNED FOR MEASUREMENT

Typically, quality measure reporting tools have been bolted on to existing EHR systems, most of which haven't had strong reporting tools baked in.

Elizabeth Simpkin

Jeffrey Ferrante, M.D.

quality, safety, and research, says Erin Kaleba, director of research initiatives. "The Alliance selected a system before rollout that it could customize with structured fields to make it easy to pull data out of the back end," she adds.

The Alliance's centrally hosted GE Centricity system was chosen because of its flexibility to allow for the creation of evidence-based dashboards, adds Tim Long, M.D., chief clinical officer. "We are getting accurate, population-level data in front of providers for the first time, and the power of that is amazing," Long says. "We are able to show them 100 percent of their population. They can see it is tied into national measures and American Diabetes Association guidelines. That is powerful. A lot of people think they are adhering to guidelines when they are not."

The Alliance provides its member health centers monthly dashboard reports of performance on diabetes, coronary artery disease, preventive care and screening, HIV/AIDS, and hypertension.

but by and large those are things it is already doing. "Where we will have to do more is in patient engagement with a portal and having visit summaries ready for patients," she adds.

Another next step is getting clinicians more comfortable with using clinical decision support tools at the point of care and sharing data with patients, Long says. "Physicians are missing the boat if they see this whole new tool only as a way to do what they used to do on paper but do it electronically."

BOTTOM-UP REPORTING AT DUKE

Enterprise data warehouse efforts at the three-hospital Duke University Health System in North Carolina have evolved to take a bottom-up approach to performance improvement. Duke clinical informatics leaders have layered business intelligence tools on top of the data warehouse and then opened them up to its own clinicians on the Intranet.

"We could have analysts in a centralized environment write reports. There is value in that," says Jeffrey Ferranti, M.D., M.S., acting chief medical informatics officer and vice president of clinical informatics. "But we decided to let the clinicians themselves ask questions about patient safety more targeted to their specialty, and they are learning to ask innovative questions."

Duke University Health System teams are developing tools such as the Adverse Drug Event Surveillance system. Every day a rules engine scans the clinical information systems of inpatients at Duke hospitals to look for patient demographics, lab results, and medication orders that may be indicative of potential harm. Another project involves computerized physician order entry (CPOE) metrics. A partnership between CPOE, health

WE DECIDED TO LET THE CLINICIANS THEMSELVES ASK QUESTIONS ABOUT PATIENT SAFETY MORE TARGETED TO THEIR SPECIALTY, AND THEY ARE LEARNING TO ASK INNOVATIVE QUESTIONS. —*JEFFREY FERRANTE, M.D.*

But one organization, the Alliance of Chicago, had a vision early on that among key uses of its system by more than 25 safety net health centers were

pertension.

Kaleba says the Alliance is making some modifications to meet the 44 meaningful use clinical measures,

Dell: Creating a Unified Clinical Archiving Solution

SETTING THE RECORD STRAIGHT ON CLOUD COMPUTING

Q: In your opinion, what is the most significant data management challenge facing healthcare organizations today?

Dr. Coffin: There is an explosion of data right now. For example, 10 years ago, the biggest images were eight-slice CT scanners. Today, there are two major manufacturers offering 256-slice CT scanners. A standard 256-slice CT scanner can produce 7,000 images. It's a huge amount of data. There has been a proliferation of data in other areas too, for example, genome projects. The average person's unannotated genomic data is about 500 gigabytes. Multiply that by close to seven billion people who live on this planet. Genomics will become more important because it will allow clinicians to prescribe drugs that will be targeted to an individual's genetic data, thereby getting the right drug to the right patient right away. The biggest challenge is how to manage this information explosion and make all of this data readily available to clinicians at the point of care.

Q: How are hospitals and physicians currently managing how they store images, for example, MRIs?

Dr. Coffin: Historically, after a patient would have an MRI, she would go to an imaging center, pick up the film, which was stored in an imaging library, and then take it to her doctor. If she would need to see another doctor, she would have to go back and pick up the film. That's changed in some bigger cities where large hospital groups are using picture archiving and communication systems (PACS) to connect to affiliated physicians. After the MRI is taken, the image is loaded into a PACS, and the physician can access it anytime, anywhere—at home, at the office, in the hospital—and use the data in real-time. There is also a huge cost-savings involved, because suppose the MRI can't be found? Ordinarily, that would result in the doctor taking another MRI, at a cost of about $1,000. Imagine having to do that over and over again. That's why having a good archive really helps. Once the image is there, it can't be lost.

Q: What challenges are hospitals facing as they're trying to store all of this data?

Dr. Coffin: Several large hospital systems have multiple PACS. Take an area like cardiology. They'll have different PACS from different vendors for each modality, such as electrocardiography, echocardiography, nuclear imaging, etc. But none of the PACS talk to each other. Another challenge is data migration. Suppose a hospital buys a Siemens MRI and Siemens PACS, but then decides to move to GE. It costs about $10,000 a terabyte to move that data. For hospitals with hundreds of petabtyes in data, it can cost millions of dollars to move data from one platform to another.

Q: What is Dell doing to help solve these problems?

Dr. Coffin: Dell has developed an end-to-end solution for medical image management and archiving: Unified Clinical Archive (UCA). It doesn't matter what PACS system a hospital uses. The hospital can store all of its medical images across multiple clinical departments on-premise, or in a secure cloud, and retrieve it whenever their physicians need it in a standard format.

Dell's Unified Clinical Archive includes safeguards to protect confidentiality, integrity, and availability of patient information to promote Health Insurance Portability and Accountability Act (HIPAA) compliance for our clients.

Q: How do you maintain security?

Dr. Coffin: Dell is the largest healthcare IT services company in the world. There are approximately, 5,500 hospitals in the U.S., and Dell runs the data centers and provides the IT for 500 of those hospitals. We either run the data at their site or in our data center. And no matter where we run the data, we pay close attention to the requirements of HIPAA and associated compliance, and security and privacy issues. When Dell acquired Perot Systems two years ago, Perot had been managing data for large hospital systems for close to 25 years, so they really understand the constraints and security and privacy issues in storing healthcare data.

This is very different from the concept behind the Amazon or Google cloud. Most generic cloud services have not put the safeguards in place to deal with Protected Health Information (PHI). Dell's approach is to provide a secure private cloud for healthcare customers with the proper safeguards for healthcare applications and data.

Dell's Unified Clinical Archive operates in a secure, private cloud. To the customer, it looks as if the data is sitting in their data center. Right now, we're managing more than four billion images in our cloud for our customers. And, Dell is making sure that it has the same security and privacy as if the data was sitting in the customer's own private data center.

Q: Earlier this year, Dell closed on its acquisition of InSite One. Why did Dell acquire that company?

Dr. Coffin: Over the past three to four years, we have been focused on developing a unified clinical archiving solution to simplify image retention for hospitals and improve information access for clinicians.

Although cloud-based services can simplify information access and sharing from the data center to the point of care for more efficient healthcare, there are many misperceptions about cloud solutions that are slowing down their acceptance by hospitals and physicians. Dr. James Coffin, vice president and general manager of Dell Healthcare and Life Sciences, wants to set the record straight and clear up these misconceptions. In this exclusive interview, he discusses why cloud-based services are important and how they can be delivered more efficiently so that physicians have data they need, at the time they need it to provide better patient outcomes.

One of our partners in this project was InSite One, a company that has led the way in medical archiving in the cloud. According to market forecasts, medical image data in North America is projected to grow more than 30 percent annually, and will represent 35 percent of healthcare data by 2015.

Q: What benefits does UCA or a cloud solution have for smaller hospitals?

Dr. Coffin: These smaller hospitals have very slim IT staffs, often have limited data center capacity, and may not have the expertise required to address ongoing data management complexities. The amount and types of data they have to manage is growing, and the profile is really no different than data stored by their larger peers. That's why Dell developed the MSite solution, which hosts the MEDITECH applications in a state-of-the-art private cloud and provides technical and applications support, maintenance, and disaster recovery. It gives these smaller hospitals that are using MEDITECH access to the Health Care Information System (HCIS) software through the cloud. MSite, coupled with our cloud image archive solution from InSite One, addresses these hospitals' clinical needs from the HCIS to data management.

Q: What role does the cloud play in managing and storing medical images for small hospitals?

Dr. Coffin: A small hospital is probably taking anywhere between 50,000 and 500,000 images a year. That's a lot of data for them to store. But in the big scheme of things, it's not an enormous amount of data for Dell. With InSite One, a small hospital can keep six to 12 months of data on site, and the rest is automatically archived through a gateway in a secured cloud. And it is automatically archived in two data centers—one in Arizona and the other in Connecticut. The hospital doesn't have to back up images because the two data centers are mirror images of each other to provide redundancy and disaster recovery.

Q: Do you believe that healthcare professionals have any misconceptions about cloud technology that influence how they decide to store data?

> Under most current state laws, pediatric physicians are required to keep images for people until they are 18 or 21 years old. How do you store this enormous amount of data in a way that is easily accessible and can deliver it to the point of care so physicians can make good clinical decisions?
>
> —Dr. James Coffin

Dr. Coffin: When most people, even healthcare professionals, think about the cloud, they automatically think of Amazon or Google—large scale, multi-tenant clouds. Those clouds are not specific to the healthcare industry and are likely not addressing all the safeguards required for PHI data. When Dell talks about "the cloud," we mean a virtual private cloud that makes data accessible, but keeps it safe and secure. Our company understands the difference between the cloud in general, and having a secure, private healthcare cloud. It makes a big difference in our approach to cloud computing. Dell controls who accesses the cloud. Our unified virtual EMR cloud is exclusively for physicians. And it can run any EMR or physician's practice software package, whether it's NextGen or Allscripts. It doesn't work any differently than a large company having an off-site data center. Dell essentially becomes their off-site data center, but it looks like the hospital's infrastructure.

The other misconception is that the healthcare industry shouldn't worry about the cloud because it's not coming any time soon. But, it's coming very quickly. In the next three years, about 50 percent of hospitals will be using cloud services. Currently, Dell is hosting more than four billion medical images in the cloud and we are driving the move to the cloud, with a focus on security and privacy, especially as it relates to HIPAA. You can't put info in the cloud and give lip service to security and privacy.

Q: Is the solution in the technology hardware?

Dr. Coffin: The technology itself is not the answer. It's about solutions that solve customers' problems. With the proliferation of data in healthcare, how can physicians access that data in the most efficient way? It's important to figure out how to archive that data and put it in a secure place once so the customer doesn't have to migrate it again if it changes platforms. Dell doesn't want its healthcare customers to spend millions of dollars migrating data. We want them to spend money on more important things, such as clinical efficiencies and improving care, instead of dealing with vendor lock. The most progressive vendors in healthcare IT today realize it's not about locking in customers. It's really looking at ways to share data effectively and improve patient outcomes.

analytics, and IT patient safety team members provides users metrics related to clinical order sets and decision support. A CPOE survey provides feedback on clinical decision support, workloads, and safety concerns.

A tool called DEDUCE (Duke Enterprise Data Unified Content Explorer) supports quality monitoring and improvement efforts. "We could ask it to show all the diabetes patients in Durham County and what medications they are on," Ferranti explains. It can identify outliers such as diabetic patients who haven't had their A1c hemoglobin levels tested recently.

"These tools also can help us see differences in outcomes in our three different hospitals, such as rates of C. difficile colitis," he adds. "The difference between 0.5 percent and 1 percent is very hard for doctors to discern, but with the data warehouse we can identify problems and intervene."
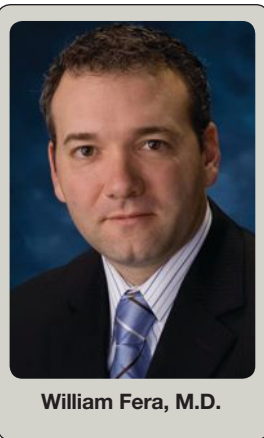
TRIHEALTH: PULLING DATA FROM MULTIPLE EHRs

Setting up a performance measurement scheme for ambulatory physicians using a multitude of EHRs is a challenge, but TriHealth, an integrated healthcare system formed as a partnership between Good Samaritan Hospital and Bethesda Hospital Inc. in Cincinnati, was
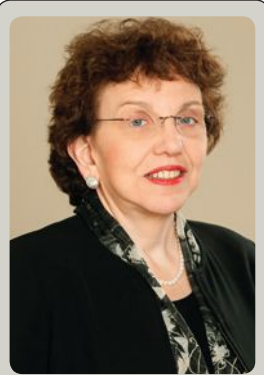
Carole B. Black, M.D.

John Ward

William Fera, M.D.

undaunted. Beginning in late 2008, TriHealth, which has 250 employed physicians, created a clinical data warehouse that enables practices to generate on-demand reports about treatment recommendations, patient vital statistics and treatment compliance.

Led by Georges Feghali, M.D., chief medical officer for TriHealth, a quality committee came up with 12 priority protocols. "Then a clinical data warehouse committee made up of IT and physician leaders defined the components to extract, how we are going to build it, and if there are any missing data elements, how we can get that data," explains John Ward, director of health system IT integration.

"One of the biggest challenges is working with the different vendors' applications in terms of trying to find where to extract data elements so we can normalize it," says Ward. "So in terms of recording smoking status, five applications might put it in five different places in the chart, such as in social history or in physician notes. We had to go in and find all the places that might be, where to get it and in some cases change the workflows of physicians to standardize that. That was one of the most difficult aspects."

TriHealth has a strong focus on the

medical home model and has added nurse coordinators and diabetes educators for patient follow-up. Ward says it has already seen some practices make vast improvements since it started offering them more immediate and complete performance data.

For instance, one practice started in 2009 with only 16 percent of its diabetic patients meeting the definition of having their condition under control. That number changed to 32 percent in 2010. "That is a huge improvement," Ward says. "I think the physicians have previously been starved for data, and are now thinking in a different way," he adds. "They now think in terms of their populations with chronic conditions. That's how you get the dial to move."

TIMELY DATA FOR CHRISTIANA CARE'S CLINICIANS

Digging deeper into clinical results in its own data warehouse has led to several performance improvements at Christiana Care Health System in Wilmington, Del.

Two years ago, the two-hospital system sought to better understand several performance issues, including extended hospital stays. Using a tool called CareDiscovery from Thomson-Reuters, Christiana Care analysts and physician teams studied clinical performance and utilization management in specific diagnosis-related groups such as heart disease.

Donna Mahoney, director of data acquisition and measurement, leads a team of eight analysts working in the Center for Quality and Safety. She says her job is made much easier by the fact that Christiana Care has had a data warehouse in place for 15 years. "We can go to the data warehouse team with any issue we have. They are the ones preventing us from having to do this through chart abstraction, which would be quite difficult."

# Ambulatory EHR and Practice Management System Demand

DEMAND FOR NEW AND REPLACEMENT SYSTEMS IS RELATIVELY STRONG AMONG CERTAIN PHYSICIAN GROUPS BY JOHN DEGASPARI

Demand for electronic health record (EHR) and physician practice management (PM) systems is relatively strong among certain physician groups, and is expected to remain so over the next 12 to 24 months, according to a recently released survey by CapSite Consulting, Williston, Vt. One objective of the study, which is the company's third annual report on EHR and practice management system demand, was to assess how the Health Information Technology for Economic and Clinical Health Act focus on stimulating adoption and achieving meaningful use is influencing demand for EHR and practice management solutions.

The survey polled about 1,300 physician groups ranging in size from one or two doctors to groups of more than 100

doctors, roughly divided between freestanding groups and hospital-owned groups. Each year, more physician groups have made an EHR purchase. When respondents were asked if they recently (defined as the prior 18 months) purchased an EHR, 62 percent said they had made a purchase, compared to 36 percent and 40 percent in 2009 and 2010, respectively. Purchases of ambulatory EHR solutions have increased steadily each year over the last several years.

According to CapSite senior vice president and general manager Gino Johnson, demand for EHR and PM solutions has continued to accelerate and is on track to nearly double in the volume of purchasing activity that was measured in 2010. "This activity is continuing, and as we extrapolate the full year of 2011, we have confidence [demand] will outstrip
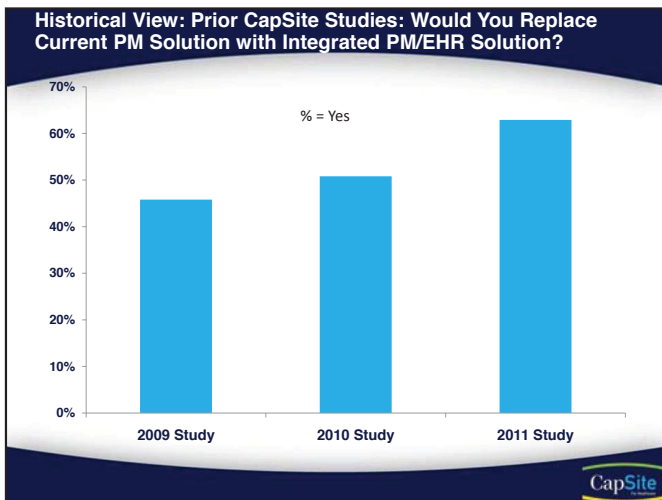
Source: CapSite

Source: CapSite

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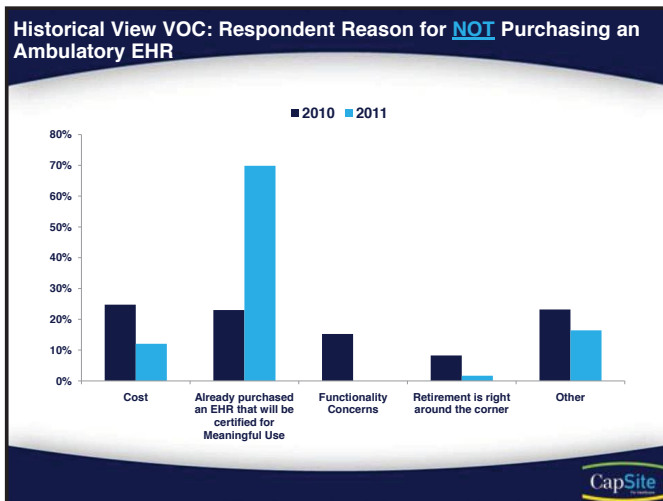**866.928.2843 : athenahealth.com/tamebeast**

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Historical View VOC: Respondent Reason for NOT Purchasing an Ambulatory EHR

Source: CapSite

Market Opportunity: Timeframe for Purchase

Source: CapSite

2010 by a significant margin," Johnson says. He adds that demand has not yet reached a plateau, and noted that market demand for ambulatory EHR and PM solutions could

THIS ACTIVITY IS CONTINUING, AND AS WE EXTRAPOLATE THE FULL YEAR OF 2011, WE HAVE CONFIDENCE [DEMAND] WILL OUTSTRIP 2010 BY A SIGNIFICANT MARGIN.

reach $3 billion by 2013.

Among the highlights of the study:

- 63 percent of physician groups indicated they would replace their current PM for an integrated PM/EHR solution;
- 38 percent of physician groups plan to upgrade or replace their current PM system; and
- Efficiency and quality ranked as the top two reasons for purchasing an EHR solution, while stimulus funding ranked third.

GROWTH FACTORS

Demand for ambulatory EHR has increased steadily since 2006, notes Johnson, which he attributes to stimulus monies from the American Reinvestment and Recovery Act/Health Information Technology for Economic and Clinical Health (ARRA-HITECH) Act. Those funds have prompted many physician groups to decide that now is the right time to invest, he says, adding that attractive pricing models and strong marketing efforts on the part of vendors have also been positive factors.

A significant number—63 percent—of respondents said they would consider replacing their existing PM solution with a combined EHR/PM solution. The number has increased steadily over the last three years from 46 percent. Johnson notes that the response suggests that an increasing number of physician groups are looking for vendors that have a strong message of an integrated EHR-PM solution. He adds that an integrated EHR/PM solution makes sense from a simplicity standpoint. Having one less vendor relationship to manage is a bit more attractive from a physician group perspective, he says.

HOSPITAL-OWNED VERSUS FREESTANDING PRACTICES

The survey uncovered some differences between hospital-owned and freestanding physician groups. Hospital-owned practices are further down the adoption path, since they generally have better financial resources, and in many cases, may already have an EHR and are now in a replacement cycle, Johnson notes. Freestanding physician practices, on the other hand, have been somewhat slower on the uptake, and are more likely to represent a new search process for an EHR, he says. He also observes that larger physician practices tend to be hospital owned. Quite a number of physician practices have been acquired by hospitals during the last year: 60 percent of the practices that responded to last year's survey were freestanding; that number is now 50 percent.

The top three reasons for making an EHR purchase are quality, efficiency and ARRA-HITECH stimulus funding.

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CMIOs Roaring Ahead

A NEW SURVEY RELEASED AT THE AMDIS SYMPOSIUM CHARTS THE GROWTH OF CMIOs' STATURE IN THEIR ORGANIZATIONS BY MARK HAGLAND

As a variety of developments and trends in healthcare intensify the demand for patient care organizations to use clinical and other data to analyze and improve clinical and financial performance and overall effectiveness, the chief medical information officer (CMIO) role is becoming more and more firmly entrenched in patient care organizations of all kinds, a new survey released at the AMDIS Physician-Computer Connection Symposium this summer in Ojai, Calif. confirms.

Presenting findings from an online survey of the membership of the Association of Medical Directors of Information Systems (AMDIS), Vi Shaffer, research vice president at the Stamford,

Conn.-based Gartner, and Dick Gibson, M.D., Ph.D., chief healthcare informatics and intelligence officer for the Oregon Region of the Portland, Ore.-based Providence Health Systems, on July 14 provided the assembled CMIOs with a snapshot of where their profession stands at this key juncture in healthcare.

Opening the joint presentation, Shaffer said that the survey, which netted 74 respondents and closed just before the Symposium began, confirmed a significant maturation of the CMIO role within hospitals, large medical groups, and integrated health systems. "This decade brings a second wave of major change for the CMIO," Shaffer told the assembled audience.

"By and large, the previous decade was about an understanding of the need for this position and the gaps involved in functions leading to it. Wave two is very significant: it is an evolution of responsibilities, both within the EHR and beyond; it is growing needs and specific informatics resources—specifically a growth of the CMIO position to harvesting high value from the EHR and information and communications technology overall. That is significant, and it is a stretch of time and responsibilities from before," she said.

These are among the key findings:

Among survey respondents, 64 percent are currently in their first CMIO position, down from 81 percent in 2010, meaning that more experienced CMIOs are moving to posts beyond their first CMIO positions.

Among respondents, 56 percent are 50 years old or older, while 44 percent are between 30 and 49 years old.
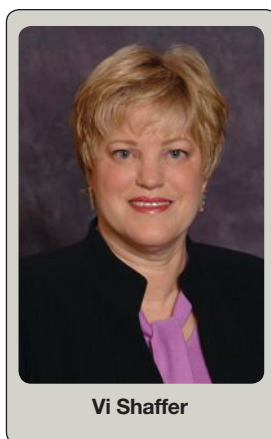
THERE MUST BE A MATRIX RELATIONSHIP; AND THE CHEMISTRY BETWEEN THE CMIO AND CIO IS VERY IMPORTANT. —*VI SHAFFER*

In terms of where they're headed, 71 percent want to stay in their CMIO job long-term (though 14 percent want to move to a different institution); 7 percent would like to become CIOs; another 7 percent would like to become CEOs or COOs; and 4 percent would like to become CMOs.

There continues to be a very wide range of compensation levels, ranging all the way from $150,000 to above $500,000, but with most survey respondents clustered within two swaths: $250,000 to $300,000 and $345,000 to $375,000.

Within those compensation levels, 41 percent receive a straight salary, while 49 percent receive a salary plus some kind of bonus.

Meanwhile, compared with physicians in their medical specialty and with a similar level of experience, 67 percent make more than such physicians, while 15 percent make the same and 17 percent make less.

In terms of their organizational type, 81 percent report that they work at integrated health systems with affiliated medical group practices, while 9 percent work in standalone hospitals; most have enterprise-wide responsibilities.

MU, ACO CHALLENGES NOTED

Shaffer reported that the top three concerns of respondents over late-stage meaningful use were: challenges with assembling and reporting the required data (by a wide margin); complexity or confusion about the criteria; and a lack of executive

Vi Shaffer

leadership and change management in their organizations.

Meanwhile, with regard to the development of accountable care organizations (ACOs) under federal healthcare reform, survey respondents cited the following as their biggest challenges: inadequate compensation to their organization relative to the risk; gaps in information systems for care management; gaps in business, clinical analytics, or reporting; and confusion over criteria.

Gibson shared data from the survey regarding reporting relationships. At this point in time, he reported, 61 percent of CMIOs surveyed now have staff reporting to them, anywhere from one person to 125 people, with a majority reporting in the two to 25 range.

To whom do CMIOs themselves now report? The survey found that 47 percent of those responding report to the CIO of their organization; 29 percent to the chief medical officer (CMO); 5 percent report dually to the CIO and CMO; while 19 percent report to the CEO or COO. Gibson noted several advantages to reporting to the CMO. Among them:

• The CMO is more likely to be able to affect change in the organization;

• Reporting to the CMO puts the CMIO in a politically stronger position with the physicians;

• CMIOs universally report easy relationships with CMOs, while fewer say that about their relationships with CIOs;

• The CMO-CMIO relationship was reported as optimal in terms of supporting the quality department;

• Reporting to the CMO was cited as being helpful in terms of achieving practice and workflow changes for doctors;

• CMOs were seen as frequently involved with local implementations, and they were seen as better-positioned to spur the use of a clinical information system after implementation.

THE REAL WORLD OF RELATIONSHIP COMPLEXITY

Still, as one CMIO interviewed by *Healthcare Informatics* noted, "When it comes down to it, my being in the IT department has strengthened my ability to get things done; and I also have budgetary responsibility and staff." That CMIO reports dually to the CMO and CIO in his organization. And that kind of arrangement, Shaffer told *Healthcare Informatics* in an exclusive interview, is really the way things are moving for many CMIOs these days.

As Shaffer explained it, "There are new changes in our recommendations around reporting relationships. On the one hand,

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Healthcare Reform and The Future of Work

BY SASHI PADARTHY, COGNIZANT

This article addresses today's healthcare challenges, healthcare reform, and the ways in which the industry can move toward investment in more automated, virtual business models that align with emerging demographic imperatives and technology trends.

ADDRESSING REFORM

During the past few years, nearly every sector of the U.S. economy has gone through massive transformational changes. Current U.S. healthcare spend is 17.6 percent of the U.S. Gross Domestic Product and is projected to approach 19.8 percent by 2020. These numbers are a cause for concern, both economically and politically. Under the tandem forces of Centers for Medicare & Medicaid Services (CMS) initiatives and the healthcare reform bill, the healthcare industry is being challenged to change its care delivery model.

There are a number of gaps in our current care delivery model, including a quality gap, a safety gap, an informational gap, and an efficiency gap. As an industry, we need to close all of these gaps almost at the same time, and only then we will be able to truly bend the cost curve.

One of the biggest areas of focus has been the variation in cost, both nationwide and regionally. For the same cost, the quality of care can vary widely. Areas that deliver high-quality care are also often the lowest cost areas.

Another industry challenge is to change the mindset of payers, providers and patients from "sick care" to "well care." The only way to get ahead of the health cost curve is to emphasize health and wellness, and to change the reimbursement model to provide incentives to develop necessary infrastructure, such as patient centered medical homes, disease registries, and care management strategies.

CLOSING THE GAPS: QUALITY, SAFETY, IT, EFFICIENCY

Although health IT (HIT) isn't a silver bullet for success, it is a clear requirement when it comes to the data gathering, consolidation and sharing needed to address today's emerging healthcare requirements. This is more than a pure technology problem. It's also about coordinated care, which requires organizational change management and physician buy-in.

In the past, major IT investments have suffered from unclear ROI and scarce capital. But today, most healthcare entities have access to technologies that can help them close the quality, safety, informational and efficiency gaps without massive investments.

The advent of cloud computing and the "software-as-a-service" (SaaS) model open up a whole new world, especially for smaller hospitals and stand-alone facilities. Now, providers can pay as they go, and they don't need to make huge capital investments in order to take advantage of these technologies.

Data standards for data exchange, storage and retrieval are essential for data sharing to become pervasive. Closing informational gaps will also require commitment to standards for Healthcare Information Exchanges (HIEs), EHR/EMR functionality, and information security.

CMS' recent initiatives, notably the Accountable Care Programs (ACOs), have opened other doors. CMS recently launched two types of ACOs: The Medicare Shared Savings Program and the Pioneer Program. As the name suggests, an ACO is designed to address not only "sick care," but also population health in general, encouraging all entities in the ACO to develop better care management strategies, better care coordination, and better risk management. Leading payers are already conducting ACO pilots in collaboration with hospitals.

The ACO is a brand-new business model for hospitals. Embracing this new business model will bring payers and providers closer together in an unprecedented fashion. It can be vertically integrated, or a virtual organization. The goal is to promote

better coordination of care, improve quality and outcomes, and reduce costs. For years, industry experts have been evangelizing coordinated care as a requirement for improving quality and outcomes. Now we are closer to this goal than ever before.

What the healthcare industry can achieve through IT optimization is limited only by the ability to harness it. If we can achieve a truly integrated view of a patient's care-life, then we have an opportunity to significantly improve that care. Such coordination could help eliminate unnecessary services, reduce redundant testing and missed health screenings, and improve data collection. In order for provider organizations to take advantage of programs such as ACOs, Patient Centered Medical Homes and bundled payments, they will need to have a strong HIT strategy and infrastructure.

THE OPPORTUNITIES OF ICD-10

ICD-10 takes medical data down to a granular level, providing new and expansive opportunities for data mining.

Today, it is very hard for healthcare organizations to access discreet data. Whenever detailed data is needed, one has to go back to the medical records and manually scrub the data.

The conversion from the ICD-9 to ICD-10 coding structure will provide opportunities for the healthcare industry to use technology to greater advantage. For example, Computer Assisted Coding (the ability to generate ICD-10 codes based on clinical documentation in electronic medical records) is likely to become a reality. The increased granularity of data as a result of ICD-10 transition will accelerate development of evidence-based and personalized medicine protocols.

Physicians are highly trained and highly competitive professionals. If we put an evidence-based medicine protocol into place and start measuring and reporting on it, we will naturally start closing the quality and efficiency gaps.

THE BUSINESS CASE FOR HIEs

When CMS introduced ACO programs, it created a business case for Healthcare Information Exchanges (HIEs). The industry has been promoting HIEs for some time, but until now, there wasn't a business case for sharing data beyond it being "the right thing to do." Although the ACO model is evolving, we do know that it will require data sharing, since ACOs will be held accountable for cost and quality across the continuum of care.

INNOVATION IN HEALTHCARE

Innovation in healthcare has led to advances in pharmaceuticals, biotech, life-saving medical devices, and other technologies. Likewise, innovation in care delivery processes is necessary to close the gaps and reduce costs.

CMS has established an innovation center with billions of dollars of capital to provide seed money for hospitals, health systems and providers to pilot their innovations in care delivery and spread the best practices across the nation. Any provider with a great idea on how to reduce the cost of care and improve quality can take those ideas to CMS, and CMS will enable the provider to experiment formally on a local level. It's all about spurring innovation.

While it may be easy to look toward the future, it's a much greater challenge to do what's needed in the present to transform practice models. Cloud computing, SaaS, globalization, virtualization – along with healthcare reform and other policy changes – have opened up new opportunities for providers to experiment and transform care delivery practices.

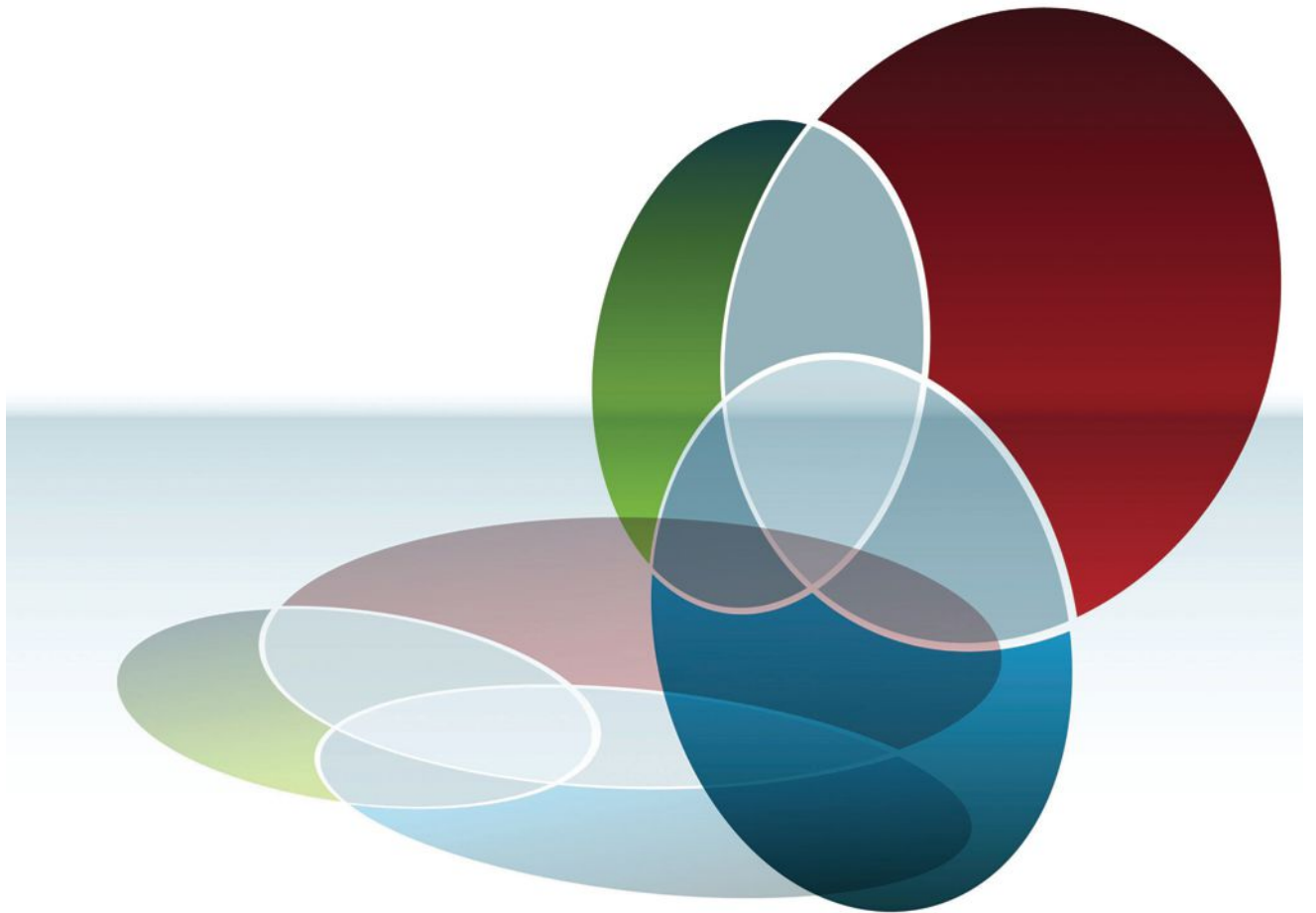*Sashi Padarthy leads the Provider Practice of Cognizant Business Consulting, Healthcare.*

What HIXs Can Learn from HIEs

SCOTT DEVONSHIRE, CIO, MASSACHUSETTS HEALTH CONNECTOR TALKS ABOUT THE SYNERGIES THAT CAN OCCUR BY JENNIFER PRESTIGIACOMO

Now that the Department of Health and Human Services (HHS) has announced the proposed rules for Affordable Insurance Exchanges, industry experts say that it's time to borrow ideas from IT infrastructures that health information exchanges (HIEs) have already built or are building. One proponent of leveraging preexist-ing synergies between insurance and information exchang-es is Scott Devonshire, CIO, Massachusetts Health Connec-tor, the state's health insurance exchange.

On July 11 HHS Secretary Kathleen Sebelius announced proposed legislation that mandates states to create mar-ketplaces for consumers to compare and shop for different

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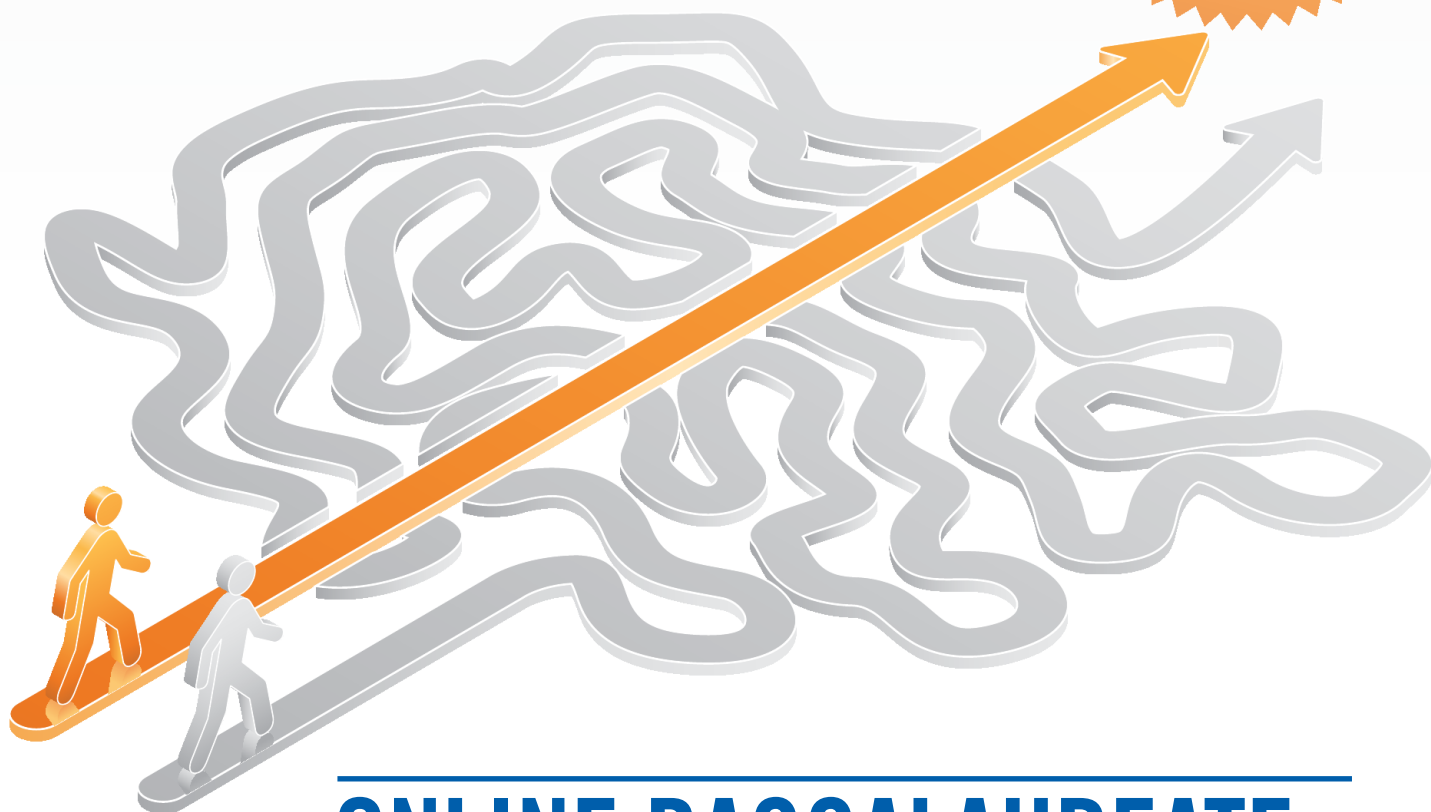
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health insurance plans. Sebelius said that states would have the flexibility to design their own exchanges and there was no "one-size-fits-all solution."

Massachusetts got an early start on its insurance exchange as a part of its health reform law in 2006. In 2010, about 98 percent of Massachusetts residents had health insurance, including 99.8 percent of the state's children. Much of its coverage provisions, like subsidized coverage options for people with low and moderate incomes, became the basis of the federal Patient Protection and Affordable Care Act (PPACA), enacted in March 2010.

In February HHS awarded $241 million in "Early Innovator" grants to Kansas, Maryland, New York, Oklahoma, Oregon, Wisconsin, and a multi-state consortium led by the University of Massachusetts Medical School to pioneer IT infrastructure around health insurance exchanges. The University of Massachusetts Medical School received $35.6 million on behalf of the New England States Collaborative for Insurance Exchange Systems (NECSIES), of which part will fund an in-depth analysis of what the Health Connector will be able to reuse and what will be additionally necessary to comply with the 2014 PPACA requirements. One of the first items the organization is trying to nail down is the policy and technology requirements of a real-time integrated eligibility system which, as Devonshire says, many states are struggling with.

ALL-PAYER CLAIMS DATABASE

One way that Massachusetts' Division of Health Care Finance and Policy (DHCFP) plans to leverage common HIE

IT'S GOING TO BE A PRETTY ROBUST TOOL TO CAPTURE CLAIMS DATA AND HAVE SOME PROVIDER DIRECTORY INFORMATION. IT'S A TREMENDOUS UNDERTAKING JUST TO GET SOME CONSENSUS ON HOW TO DO THIS. —SCOTT DEVONSHIRE

ground is to work with health insurance carriers to develop an all-payer claims database. "It's going to be a pretty robust tool to capture claims data and have some provider directory information," Devonshire says. "It's a tremendous undertaking just to get some consensus on how to do this."

He says that this would create a central hub for all interested parties like public health agencies, health plans, etc., to go to for information to support the insurance exchange. This would also allow for a common transmission method for carriers instead of customizations for each insurer.

At an HIX/HIE panel in July at the eHealth Initiative

2011 National Forum on Health Information Exchange, representatives from states spoke about the synergies that can be derived from collaborating resources between state HIEs and HIXs. Both Kim Davis-Allen, statewide HIT coordinator, Alabama Medicaid Agency, and Edward Dolly, deputy commissioner, state health information technology coordinator, West Virginia Bureau for Medical Services, said that their states were leveraging resources and lessons learned from their HIEs to drive planning for their health insurance exchanges. Davis-Allen noted that if an HIE has good population data, this information can be translated to the HIX, so patients can see which health plans are best for them and health plans can use that population data to structure better benefit packages to speak to the populations they serve.

Devonshire hopes that his organization can capitalize on its early success, and go even further by using its information for risk management capabilities and models for the Health Connector. He also says Massachusetts plans to embark on a publicity campaign, partnering with the Boston Red Sox, using radio ads, TV spots, and direct mail to educate the public on changes in the HIX in light of future ONC regulations.

SUSTAINABILITY

As with HIEs, there is no tried and true path to sustainability, and it has yet to be seen how prescriptive the PPACA regulations with be around financial options. Devonshire says he believes it's a shared responsibility and collaborative engagement between his state's private insurers and public interests, along with government support. The Health Connector is currently funded through an administrator fee per plan that is agreed upon with the carriers. Devonshire predicts that future options could entail premium billing services for individuals and small groups purchasing through the exchange and provider contracts.

Devonshire is excited about a few new tools his exchange is launching. One is an integrated search, for consumers to shop for plans by providers and by hospital networks. "It's something that as far as we know has never been done before," he says. "It's going to be a huge boon to consumers, who may not be just shopping by price or benefit, but want to understand which doctor is available for which plan." The Health Connector recently implemented a wellness program for small businesses, funded by a state-authorized 15 percent subsidy per employee toward employers' premiums. ◆

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Ambulatory Information Systems: The Last Frontier

IT'S TIME FOR THE HEALTHCARE INDUSTRY TO PROVIDE EMR SUPPORT TO SMALL PHYSICIAN GROUPS BY PETE RIVERA
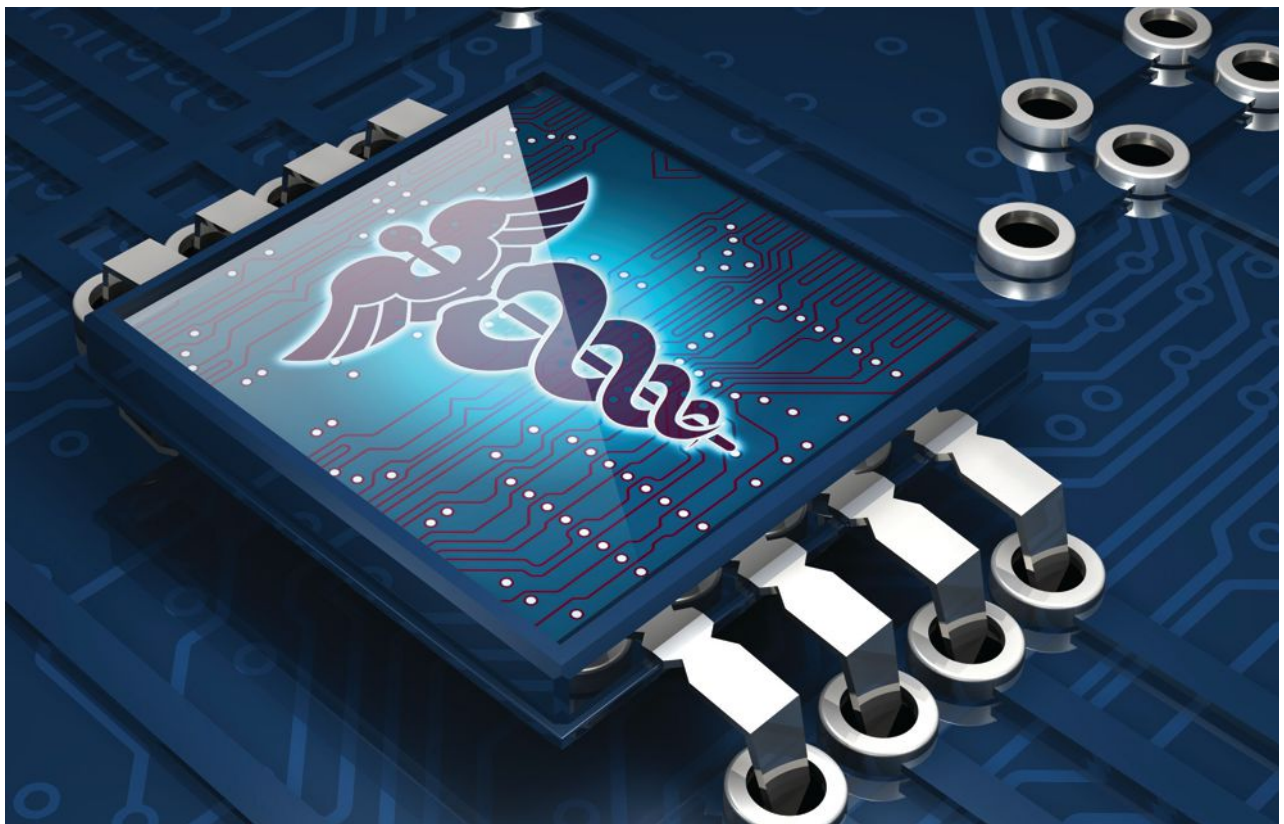
When I first started managing ambulatory information technology (IT) Systems, there was not much in the way of technology to manage. The hospital system that I was with had acquired a string of solo and multipractice offices and wanted to streamline its operations by installing a practice management (PM) system. The systems at the time were very straightforward.

They had an electronic schedule that was not any more sophisticated than our current Outlook calendars and the PM system came with the ability to enter charges into an electronic HCFA 1500 claim form. Electronic claims were just starting to take off, and we spent most of our time testing with payers and migrating physician practices from a paper appointment book.

Over the years, ambulatory IT systems have evolved to include electronic claims scrubbers, eligibility verification, and more advanced billing and accounts receivable modules. Physicians eager to embrace the advancement in ambulatory technology began using electronic prescribing (eRX) and electronic medical records (EMR) in some limited form. The challenge at the time was how hospitals could offset the enormous cost for physicians, which often involved a lengthy return on investment (ROI) period. On the other hand, these hospitals could improve the quality of care by integrating their clinical systems with ambulatory clinical data and electronically capturing the entire continuum of care.

EMRs BROADEN SCOPE

This of course changed when new Stark Laws allowed physicians affiliated with hospitals to offset some of the costs of an EMR. It seemed at the time that large hospitals and academic centers quickly began piloting EMRs with their physician's group, and vendors quickly began to fill the market

MOST MULTIPRACTICE PHYSICIANS GROUPS (FIVE TO 10 PHYSICIANS) ARE NOT PREPARED FOR THE REQUIREMENTS OF A COMPLEX CLINICAL INFORMATION SYSTEM.

with solutions. However, the dirty little secret about EMRs is that the core product is simply a notepad. Think of it as MS Word with scripts and tags that allow you to link templates or auto fill data. The real value and ROI comes from a consolidated electronic ambulatory record populated by all clinical ancillary systems and processes. These include computerized physician order entry (CPOE), eRX, e-Lab results, digital radiology, speech recognition, and electronic

THE REAL VALUE AND ROI COMES FROM A CONSOLIDATED ELECTRONIC AMBULATORY RECORD POPULATED BY ALL CLINICAL ANCILLARY SYSTEMS AND PROCESSES.

fax capabilities, just to name a few.

Early adopters had the deep pockets available, not only to tackle the challenges involved during the installation, but also to deal with the new support model that was required. Physicians, who once just had to worry about their staff sending the wrong bill to a patient, now had to worry about lab values getting posted to the wrong patient record.

Today we have government incentives through meaningful use (MU), which defines the goals of a "true" EMR, as well as certification processes like the Certification Commission for

Health Information Technology (CCHIT). We also now have desktop hardware that is less expensive and provides more horsepower than previous generations of equipment. This has allowed ambulatory EMR vendors to pack more features that physicians are already demanding and that will be required if the software has to meet MU requirements. With DSL, cable, and fiber that can be used to reach out to remote physician offices, you now have the perfect set of technology convergence for the ambulatory market.

COST AND TECHNOLOGICAL HURDLES PERSIST

So why are there still many physicians groups that have not jumped on the EMR train? Because up until now the focus had been on physician groups affiliated with hospitals and academic medical centers. For the most part, the vast majorities of ambulatory physician practices have to find the EMR funding on their own, or try to take advantage of meaningful use dollars. However, even meaningful use dollars don't come close to fully funding the cost of the software. Most multipractice physicians groups (five to 10 physicians) are not prepared for the requirements of a complex clinical information system.

Again, you cannot tackle an EMR project without including the entire set of ancillary clinical information requirements. The data flow between the electronic record and the various interfaces requires proper network security and bandwidth, proper authentication, record matching criteria, uptime and data recovery, as well as the ability to export the data to electronic media (required to meet meaningful use). The IT resources that these physician practices rely upon for hardware or network support is normally a local computer shop not prepared for protected health information and security requirements. The Geek Squad in their VW bugs will not be able to handle the complexity of a clinical information system. Physicians are often at the mercy of vendors to guide them through purchasing decisions and support models.

For ambulatory practices that are already struggling financially, the other challenge lies with the productivity hit encountered during the EMR learning curve. This is another piece of information lost during EMR demos. Physicians cannot see the same number of patients or spend the same amount of time during their typical encounters when they

are experiencing an EMR learning curve. Physician offices are often thrown into a complete tailspin when their workflow functions are dramatically changed. The office staff and physicians are quickly thrust into a new way of operating for which they may not have expected. Most vendors draw the line when it comes to helping with office workflow changes. They expect the physician practice to determine what works best in their unique scenario and how best to interface with their individual reference labs and ancillary services.

In the EMR world everything is customized, because of the variety of clinical care services provided, which encompasses primary care, complex specialty care, same day surgery, and other ancillary service inputs. Each practice comes with its own set of requirements, personalities, and eagerness to embrace change.

HELP FOR SMALL PRACTICES

For small physician offices that are trying to meet meaningful use, there are some resources that exist through regional extension centers (REC). REC services include outreach and education, EMR support (working with vendors, helping choose a certified EMR system), and technical assistance in implementing healthcare IT. RECs focus on individual and small practices, including primary care providers, medical practices lacking resources to implement and maintain EMRs, as well as those who provide primary care services in public and critical access hospitals; and community health centers, and other settings that mostly serve those who lack adequate insurance coverage or medical care.

Other resources that are often overlooked by physician practices are local Healthcare Information and Management Systems Society (HIMSS) chapters. The Central/North Florida HIMSS chapter, for example, recently developed an ambulatory IT committee with the purpose of reaching out to the ambulatory market and assisting with the proliferation of healthcare information knowledge and guidance.

Currently, ambulatory IT is truly the last frontier for pushing out technology to the first point of care. There are many challenges in deploying a robust clinical system to small physician offices. However, the time has come for the healthcare IT industry to deliver seamless, cost effective solutions to this market and provide a framework for support for those that need it and for those that may not qualify for REC support. Physicians and staff not familiar with organizations like HIMSS and resources like *Healthcare Informatics* magazine need to be informed about how to tap into this knowledge base and receive proper guidance in a vendor-neutral environment. ◆

Pete Rivera is consultant manager with Hayes Management Consulting, Newton Center, Mass., and a member of the *Healthcare Informatics* blogging team, who regularly comments on issues around electronic health record and physician management systems.

FEATURE

INFRASTRUCTURE

(continued from p. 26)

Christiana Care used a value-score methodology, which combines quality metrics (mortality, morbidity, readmission, patient satisfaction, and evidence-based guideline compliance) with expected-cost and length-of-stay metrics to give an overall value grade for high-volume populations. Value improvement teams review monthly dashboards to identify opportunities to improve the value of care for patients. "An example would be better compliance with evidence-based practices, such as patients getting the antibiotics they are supposed to," Mahoney says.

From sharing actionable data with clinicians, she says Christiana Care has seen improvement across the board in the areas it worked on. For instance, readmission rates for heart failure patients have dropped 35 percent over a two-year period. "Many of the metrics in our data warehouse are almost real-time, and it is clear that the timelier the data, the more engaged physicians are," Mahoney adds. "They don't want data that is six months old. They are not interested."

STILL IN THE MINORITY

Despite the inspiring work being done to mine clinical information systems for performance and patient safety efforts, the organizations that have made that kind of progress are still in the minority, says William Fera, M.D., executive director of Ernst & Young's Advisory Services Group practice. "We are reaching a point where more health systems are working on these reporting efforts, but it is a question of how you design it and how robust it is. It can't just be about aggregating data," he says.

One danger Fera sees is organizations focusing too narrowly on the meaningful use requirements. "We tell clients to put their focus on the longer term," he says. "If you look at Stages 2 and 3 of meaningful use, there are many more reporting requirements. Just cobbling together a few reports isn't going to cut it. And if you are looking at accountable care organizations, that will require even more sophistication, including marrying cost information with clinical outcomes and that requires robust data warehousing." ◆

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For both hospital-owned practices and freestanding practices, stimulus funding ranked third. For hospital-owned practices, quality and efficiency were equally important factors, while for freestanding practices, efficiency ranked far higher in importance than quality or funding.

A COMPETITIVE MARKET

Roughly a dozen vendors make up 85 percent of the ambulatory EHR market, Johnson says. He speculates that some physician practices that were early adopters may now be in the replacement cycle or in the market for an integrated EHR/PM solution. As far as who is in the market for a new EHR, the "sweet spot" is clearly the smaller physician groups, particularly those with fewer than 10 physicians, he says.

Broken out by physician size, practices of 11 to 25 doctors is a very competitive market for EHRs, and where the deals tend to get larger. That particular segment is a "pretty significant market, among six, seven, or eight different companies," whereas smaller and larger size practices tend to have fewer dominant vendors, Johnson notes.

In the most recent survey, 70 percent of practices cited the fact that they have already acquired an EHR as the reason they will not make an EHR purchase; roughly 25 percent cited this reason in the 2010 survey. About 10 percent cited cost as a factor. Of those that are in the market for an EHR, about 55 percent said they were working with their current EHR vendor, roughly the same range as the prior two years.

Roughly half of respondents said they planned to purchase a new EHR in 2011, about the same percentage as in 2010. In 2009, less than 40 percent said they planned a purchase. Of those groups that said yes to a purchase, most (more than 35 percent) were physician groups of 10 doctors or fewer. Most said they planned to make a purchase in seven to 12 months or 13 to 24 months. ◆

it's been true for a while that CMIOs, if you ask them to whom they should report, they will say the CMO. But more and more are acknowledging that the reporting relationship must be a hybrid between the CMO and CIO. The CMIO is very intertwined with and interdependent on the CIO; it must be a non-competitive co-creation, as they say at the *Harvard Business Review*."

Shaffer also noted that "There must be a matrix relationship; and the chemistry between the CMIO and CIO is very important. Our old prediction" with regard to recommending where the CMIO should report "was towards the CMO; this is our new one—this is the advanced CMIOs and advanced CIOs recognizing this" with regard to a matrix or dual reporting relationship to the CMO and CIO, she said.

MOVING AWAY FROM THE 'GEEKY DOC SYNDROME'

CMIOs attending the symposium agreed that the CMIO role is maturing. John Lee, M.D., who is one of three lead medical informaticists at Edward Hospital & Health Services, an integrated health system in the Chicago suburb of Naperville, Ill., told *HCI* that "CMIOs' role continues to expand in terms of the usability of the systems, in harvesting value for the EHR; and evolving role in data analytics, in IT governance, and in the use of business analytics, but also in the connectedness between the capabilities of the EHR and CPOE and documentation and clinical decision support; and analytics."

And Bobbie Byrne, M.D., Edward's CIO and a pediatrician by specialty, said, "I think we're at this point where there are still CMIOs who are the classic 'geeky hospital docs'; but that situation is changing, and there now are some really strategic CMIOs who are really helping to plan things."

Given that she herself is a physician, how would Byrne advise non-physician CIOs about how to help their CMIOs be successful? "For those CIOs who are not physicians, I would say, 'Get to know your CMO,'" she said. "Get elbow-to-elbow with your CMO, and figure out how to make your organization's CMIO position work. And if you don't have one, you'd better get one. And it can't just be the geeky hospital doc who likes computers."

Added Lee: "You almost want to kind of poll the docs and figure out who, by consensus, is the most clinically efficient doc and the most astute doc, and then see if you can get him or her to be your CMIO." ◆

Why Would I Want to Work for You?

CLEARLY LAYING OUT YOUR MANAGEMENT STYLE TO CANDIDATES IS THE BEST WAY TO AVOID MISUNDERSTANDINGS WITH NEW HIRES
BY TIM TOLAN

Tim Tolan

When HCIT candidates engage in a search opportunity, we progressively learn more about their backgrounds and experiences and quickly find out they have their own list of questions. Sure, they want to know about the specifics of the opportunity—culture, compensation, benefits package, and scope of the job—but they also have a more important question to ask: What is it like to work for you?

How should you answer? I always ask CIOs and other hiring managers this question, and it usually provokes a quick laugh or a brief pause in the conversation. Let's face it: it's a very direct question that forces many of us to stop and think about the answer. I share the candidates' desire to better understand the DNA of the person calling the shots. No need for a flippant answer, or to move to the next question. This is the time to tell it like it is, before you hire the candidate. Think about the way you'll answer this question the next time it comes up. Try to put your answers into "buckets" that really describe you and your management style.

Start with categories such as:

• *Overall Style:* Are you truly a mentor/coach? By this I mean, do you prefer to hire really smart people, give them guidance and a road map and then get out of their way, or are you more hands-on and prefer to roll up your sleeves and dig in? Either answer is acceptable as long as it provides a clear understanding of your style. Be candid so there are no misunderstandings later on. Your overall style will either resonate with the candidate or save you both time and frustration later on. You are who you are, so make sure you talk openly about your style up front.

• *Communication Style:* How will you communicate your expectations or your feedback on performance? Are you direct in your approach with verbal feedback, or do you prefer to document everything—cross every "t" and dot every "i"—along the way? Are you accessible when issues come up, and do you prefer a phone call, written memos, face-to-face meetings, email, IM, or text messages, or all of the above? Most leaders today use every tool available, because not all of us are wired the same way.

• *Accountability:* Employees want to make sure they are doing a good job, and having a yardstick to measure performance is important. I love metrics, timelines, deliverables, and overall pre-defined goals to give employees a target to aim for. Regular weekly meetings or conference calls to keep your team on track are vital—both for you and your employees. The importance of accountability should be made very clear during the hiring process and once they are onboard. Most people want to know where they stand and confirmation that they are doing a good job.

• *Recognition:* This is the biggest challenge for many hiring managers. Recognition is usually driven from the top-down; but as the leader of your own team, there are lots of workarounds. Recognition can be very effective in team meetings—just give one of your team members a chance to be recognized in front of their peers. Taking the team out for dinner or to a ball game or to some other outing is another way to demonstrate your appreciation for a job well done. Recognition is a very big deal to most human beings, and many experts argue that is more important than the almighty dollar!

As leaders you need to be clear about who you are. Potential employees need to know your style and what it will be like to work for you. There is no right or wrong answer here, but upfront candor and honesty will eliminate any surprises down the road.

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