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by Ramez Shehadi, Walid Tohme, and Edward H. Baker

With its slogan "Every life deserves world-class care," the Cleveland Clinic in Ohio has staked out a distinctive role in consumer-centric, innovative healthcare — including the development and use of medical IT. Founded in 1921, the clinic is known for its high standards of research and practice and its ongoing role in fostering innovation and reducing costs. Since the late 1990s, *U.S. News and World Report* has ranked it number one in cardiac care. The Cleveland Clinic Foundation, a nonprofit organization that owns and operates the hospital system, has an entrepreneurial arm called Cleveland Clinic Innovations (CCI), which develops and commercializes products and services based on research and practice breakthroughs by physicians and other clinic employees. The clinic's use of robotically assisted heart surgery and heart valve repair, for example, was initially developed through CCI. In total, more than 35 enterprises have been spun off from CCI activity, and the organization is currently helping other hospitals create similar initiatives. The Cleveland Clinic itself has a 41-building campus, 10 affiliated hospitals in Ohio, and a growing presence around the U.S. and the world, with a new affiliated hospital opening in Abu Dhabi and another planned for Singapore.

At the heart of all this is the clinic's comprehensive use of information technology. The chief information officer is C. Martin Harris, MD; he also serves as a health technology advisor for President Barack Obama. The clinic is a pioneer in providing information to patients and linking patient involvement with medical records and healthcare practice improvement. It is also vigorously experimenting with medical IT in new forms of patient engagement and education, including social media. In this interview, conducted in 2011, Martin Harris explains his view of two rapidly changing arenas, information technology and healthcare, and how they could evolve together. This interview is also available in video format at booz.com/global/home/what_we_do/services/it/IT-Foresight/itfs-video-display/50013625.

S+B: Can you discuss your role at the Cleveland Clinic, and how you see this role changing?
HARRIS: Our strategy — to transform healthcare and to be able to deliver greater value to patients over time — is closely tied to our effective adoption of information technology, which is critical in improving the actual outcomes that we can deliver to patients. In my role as leader of the strategic planning process and of the information technology division, I really get to see the marriage of those two. The result of that truly is transformation — the ability to start thinking about delivering care in ways that we've never thought about before.

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S+B: What are the key components of the Cleveland Clinic's care model — the secret sauce for its success?
HARRIS: We are focused on the patient first. Second, our model of care is physician-led, and we coordinate our services across a spectrum of related clinical specialties focused on the patient. Third, our group culture is really the secret sauce. For 90 years, we have worked in a collaborative fashion, and that is the greatest challenge for healthcare in the 21st century. It has become far more complex, and in order to deliver great outcomes for patients, our physicians, nurses, allied health professionals, and administrative staff have to work as a team on behalf of the patient.

S+B: Technology, and IT in particular, plays a strategic role in any healthcare institution. How is IT positioned at the Cleveland Clinic?
HARRIS: Ten years ago, as we were thinking about technology, we decided that we wouldn't focus on delivering content over the Internet. We felt that there were other organizations that could do that well. Instead, we would focus on service over the Internet. What has been strategic about our application of technology is thinking about how we can use it to affect the care delivery model. Let me give you a couple of examples.

As we were building our electronic medical record (EMR) system, which serves our physicians and nurses both in the physicians' offices and in the hospital, we also built tools for patients that allowed them to access that information from home. We built tools for those physicians whom we did not directly employ, and we thought about approaches to interoperability. This meant acquiring data that we didn't generate, but that we could take into our systems and then use to make the

best possible decisions for the patients we care for. In that sense, IT is strategic, because it truly facilitates a new transformed care delivery model.

But adoption of new technology remains a challenge today. Our goal was to improve the process of care over time. We thought about the best sequence for implementing the technology so that it delivered the most value at each step. So unlike many organizations, we did not implement the hospital information system first, but rather we began with the largest part of our organization, which is the ambulatory practice. That way, we could put a lot of patient information into the EMRs. When it became time to move to the inpatient side, our physicians were already using the technology on the ambulatory side, and they could immediately see the value. They could see information that had been collected prior to the patient's admission.

We found that by adhering closely to our practice goals, and applying the technology in a sequence that added value for the caregivers, we could overcome many of the barriers to technology adoption.

S+B: The topic of information exchanges in promoting EMRs in the healthcare industry has received a great deal of attention. How do you see this playing out?
HARRIS: Information exchange is the last mile in getting the most value out of EMR technology. Within an organization, you must be able to exchange information among departmental systems — like between a laboratory system and a radiology system — or from one site to another to provide value to patients.

Every day at the Cleveland Clinic, however, patients come in who have been seen by physicians who are not part of our organization. That brings us to what

I call the regional or state-level requirement for information exchange. We would like to be able to get that information into our electronic records to provide the best care to patients, so that no matter where the patients come from, we will have the information we need to make good decisions on their behalf.

This will happen first at a state scale — the state of Ohio is working on it now. But the challenge in a mobile society like the U.S. is to make it happen on a national scale. How quickly this can be executed is the critical question, and there are really multiple avenues to that end. Some will be private and others will be public. These efforts will involve large numbers of people every day. And when I say large numbers, although the Cleveland Clinic probably sees more than a million patients in any given calendar year, we're talking about tens of millions or even hundreds of millions.

Over the past few years, we've worked with technology companies like Microsoft to allow patients, at their direction, to pull information from their local market into accounts that they control. The patients can make independent decisions to move that information to the Cleveland Clinic, thereby completing the loop and making the information available so that our physicians can provide the best care. Our goal is not to dictate which information exchange the patient wants to use. We just want to be connected to any service that they find valuable. No matter what the service is, they all have one fundamental requirement, and that is that they maintain the security and confidentiality of the patient's information.

S+B: The use of new technologies is transforming most industries, and healthcare is no exception. What's the agenda for the Cleveland Clinic in terms of new, next-generation technology?
HARRIS: Information technology has now become the fastest-growing innovation area at the Cleveland Clinic, and we have been leading in that area. We've done a number of projects, including the information exchange projects. We have built analytic tools that allow us to begin thinking about not just one patient, but entire groups of patients, who either have a similar illness or are receiving a similar surgical procedure, so that we can better understand the inputs to that process and the outcomes.

The other great advance that we're seeing is more engagement on the part of patients. We were one of the early adopters of personal health records, and now we have more than 300,000 patients who have access to basic information like their lab test results, what medications they're on, their allergy list, their medical problems, and even decision support tools like when they need their next mammogram. We use IT to allow the patient to get at that information in a self-service mode just like many other industries, and that's becoming an expectation.

In some areas, we are following the herd. Many patients, for instance, already use social media, and we are exploring that. Right now, we're using it primarily for controlled medical content distribution, to help inform individuals about particular medical procedures or medical conditions. I think what we have to consider is whether it's an appropriate medium for actually trying to exchange either medical information or medical advice. I think it's a little early in the space to know the answer to that.

S+B: How can other CIOs in the healthcare industry benefit from your experiences at the Cleveland Clinic?
HARRIS: Healthcare is in a period of rapid change, and for the next decade or so, health CIOs in particular must be prepared for that process. The industry is moving beyond concentrating on technology and administrative issues — registering patients, getting them scheduled, producing a bill. Now we're in a period that I call clinical integration, where we're deploying clinical tools that allow doctors to write notes in a computer, place orders, and see their results immediately. Soon we will enter a phase that I call operational integration, which will be the most challenging but also the most beneficial for patients. In this phase, you begin by setting the outcome that you'd like to accomplish, then find the process that you'd like to use to meet that outcome, and then tune the technology to ensure that you hit it in a repeatable and reliable fashion.

The challenge for healthcare CIOs is to move away from focusing on the technology to focus on the marriage between the outcomes and how the technology allows us to accomplish them. It's a matter of broadening our perspective, moving away from being purely a technology expert to being an outcomes-oriented technology expert. ✦

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