

In this issue of the *Journal of Healthcare Information Management*, I am pleased to present an Introduction that represents a departure from those of past issues. Because e-health continues to evolve at lightning speed, it is important to take its pulse at this point. In addition, *e-health* is defined in a variety of ways by professionals throughout the healthcare industry. One recent definition states that e-health refers

to the use of Web-enabled systems and processes to accomplish some combination of the following objectives:

- Cut costs or increase revenues,
- Streamline operations,
- Improve patient/member satisfaction, and
- Contribute to the enhancement of medical care.”<sup>1</sup>

The many examples of e-health in the literature show that electronic systems and processes are really the vehicle by which healthcare can broaden the accessibility of user applications, facilitate user exchange of information, and collapse time, distance, and the information divide to better deliver care to the patient population. We in the healthcare professional population have spent more than a decade writing about and addressing the potential for delivering an electronic patient record. That being the case, access or entry to pieces of the patient record can be facilitated by the Internet and Web access.

Looking across the industry, we see that many healthcare professionals participate in this phenomenon. Tapping into the wealth of information available from these many professionals seems to be an imperative for this journal issue. As a result, the Introduction focuses not only on the exciting, timely thoughts of our interview guest but also on the voices that have been captured by this diverse journal—the voices of the healthcare constituents who are currently deploying and advancing e-health in many different ways. I would like to express my appreciation to each of the authors for the time and effort they spent to share their ideas with their healthcare colleagues.

This Introduction features an in-depth interview with one such voice.

### **An Interview with Bryan Bergeron**

I had the pleasure and honor to interact with Dr. Bryan P. Bergeron. This accomplished professional has extensive credentials in medical informatics; he is also a prolific writer and editor-in-chief of *e.MD*. His recent books include *The Eternal E-Customer: How Emotionally Intelligent Interfaces Can Create*

*Long-Lasting Customer Relationships, The Wireless Web, and The Hitchhiker's Guide to the Wireless Web.*<sup>2</sup> As you might imagine, he has given us insight and candor that can be shared with our HIMSS colleagues and the rest of the interested healthcare information technology community to better assess our own e-health strategies.

JHIM: E-health has been riding a tidal wave of interest and novelty for the last two years. In the last six months, the reality of failing companies catering to this market sector has sobered the viewpoint of many industry professionals. What do you believe are the lessons that we have learned over this two-year period?

DR. BERGERON: I believe that e-health, like e-commerce, is simply adding a touch point to existing core competencies. As they awaken from the trance induced by dot com fever, many U.S. companies—in healthcare and other industries—are beginning to realize that the Web is simply another touch point, akin to a fax, telephone, e-mail, or retail outlet.

Consider that, in most businesses, customers don't think of a brand as a dot com, catalog, or retail business. Rather, customers think of a brand as encompassing all of those touch points and more, and their expectations are identical for each touch point they choose to use. This analogy holds regardless of the brand or customer; hospitals and patients, for example, enjoy the same relationship.

Interestingly, companies in Europe and Asia, like the brick-and-mortar companies of the United States, have been spared the scourges of dot com fever. They aren't suffering from the touch-point dissonance that beset most "click-and-mortar" companies and dot coms in the United States. In this regard, it's not surprising that many dot com companies catering strictly to the e-health market are failing. They're failing because they don't have a core competency that adds value to the patient-physician-healthcare enterprise value chain.

JHIM: While telemedicine as an area of e-health has evolved well over the last few years and continues to bring value to patient care in a variety of settings, the other information technologies in e-health for physicians, in both the ambulatory setting as well as within integrated delivery systems of all sizes, have experienced only a modest level of market penetration. What is stopping us from adopting more globally these technologies that improve efficiency and automate real-time collection of patient data?

DR. BERGERON: First, I'd argue that telemedicine—defined as using the Web or the Internet to practice medicine, usually with a video link—hasn't proven itself in a variety of settings. Telemedicine pilot programs supported by the government and other interested third parties have shown mixed results, but

in most cases they haven't produced a significant return on investment. There have been numerous programs for U.S. physicians that provide service to overseas populations (thereby avoiding the legal issues of practicing across state lines in the United States). However, these have been only partially successful. In many cases, setting up a telemedicine system—which includes having someone available to support the system, train the users, and so on—requires more of an investment than hiring a radiologist to cover a hospital on a part-time basis. The volume of activity hasn't been great enough to produce a reasonable ROI.

As far as market penetration of other e-health solutions goes, the latest figures for penetration I've seen are in the single-digits for EMRs. For grassroots use of PDAs [personal digital assistants] and other personal information management technologies, the figures are much better—on the order of 20 percent of physicians, especially in smaller practices. Why the lack of penetration? Because the systems, for the most part, don't recognize the primary need of one of the major stakeholders in the equation, the physician end-user. That need is to save time. Why use a tool that's going to save some healthcare corporation a few dollars at the expense of an extra hour of a physician's time after she's finished seeing patients all day? You can force physicians to use a system, but they're not going to actively support it. They're not going to make any efforts to make it successful. Why should they?

In other words, when you say that technologies improve efficiency and automate real-time collection of patient data, who is the beneficiary? Perhaps a researcher uses the data to define best practices. Perhaps someone in accounting uses the data to change the formulary. Also, how do you define *improve efficiency*? Again, from the physician's perspective, these systems don't improve *their* efficiency. The systems get in the way. Where computerization does help a physician, especially one in private practice, is in helping his office staff schedule patients, send out reminders and bills, and help fill out reimbursement forms. However, the physician doesn't normally handle these things directly anyway.

Therefore, from a clinical perspective, the majority of the systems out there don't yet save physician time or effort. They cater to someone else's needs.

JHIM: With the proliferation of vendors in the e-health market space, what are your concerns for the healthcare consumer who is trying to decipher which vendor can best bring a solution and be a viable business partner for the foreseeable future?

DR. BERGERON: The criteria for an e-health vendor are no different from those applied to any other vendor in the space. What's the record of the company? How long has it been in business? Who is using its system, and what do they think of it? What's the vendor's record for support? What's the delivery time? What's the market share? How long has its management team been in place?

In addition to being cautious about vendor selection, it's important to critically evaluate new technologies that are dangled in front of physicians as a cure-all for the challenges of computerization. For example, the recent flurry of activity around application service providers is potentially disturbing, given that a majority of these ASP-based EMR providers will fail. When they do, the data that physicians have laboriously entered may be lost indefinitely. At best, their practice will be disrupted until the data can be exported into another ASP system. In any event, most physicians should view new and untried technologies with healthy skepticism, especially those without a computer staff on hand.

JHIM: What continued impact, direct or indirect, will consumerism have on e-health?

DR. BERGERON: It's a mixed bag. Although consumers have greater access to health-related information on the Web, much of the data are simply invalid. Every physician dreads the patient who walks in, drops a stack of printouts on her desk, and demands the latest treatment for a self-diagnosed disease. Today's physicians simply don't have time to educate their patients on every detail of a condition, nor do they have the desire to defend their medical education.

One response to this new social phenomenon is for physicians to set up their own Website (through one of the many free services on the Web) and offer links to information sites they deem medically appropriate. Medline and several university-affiliated sites, for example, offer good quality content from which patients may actually glean correct medical information.

JHIM: Would you agree that many e-health solutions are targeted to the physician? If this is the case, how would you describe the pressure, if any, that influences physicians to engage the new technology to better serve the American patient population? What can healthcare IT professionals do to facilitate this process?

DR. BERGERON: I would say that most of the e-health solutions out there are not targeted at the physician's needs. They may be targeted at the physician, in terms of trying to make a sale, but not for the physician's primary needs. In some cases, vendors are responding to requirements established by the government and other third-party payors, but not to what the physician really wants.

However, there is pressure on physicians to embrace—or at least become familiar with—some of the computer technologies simply because there's no alternative. Recent requirements for coding and complying with reimbursement regulations and other stipulations are pushing many physicians toward the keyboard. Of course, much less pressure is required in the case of younger physicians. They don't see the requirements as a change from some better time

in the past; many undoubtedly worked with computers in college and throughout their residencies.

To your last question, I think that IT professionals can facilitate the process by answering the physicians' primary need—to save time—regardless of how they do it. Everything else is secondary. Consider why the Palm Pilot became such a successful device, given that the PDA market was full of much more powerful devices. It succeeded because it was ubiquitous—and the form factor was great—and because it did a few things very well. It had a shallow learning curve and was easy to use. Translation: minimum time investment to learn and use the device.

JHIM: In spring 2000, your editorial in *e.MD* stated, “The challenge before us isn't developing new technologies. Rather, it's embracing the tools already developed and employed by other knowledge-intensive sectors of our economy to improve patient care.” Why has the market not understood this concept to date? Do you believe that this thought can be sustained for the next year or two in e-health?

DR. BERGERON: I stand by my statement. We don't need new technologies. We need to learn, as a group, how to apply existing technologies. Although we may not want to admit it, healthcare has traditionally lagged behind virtually every other knowledge-intensive profession (engineering, law, the military, business, to name a few) in terms of using information technologies.

Consider, for example, RFID [radio frequency identification] technology used by the shipping industry and the military. This wireless technology involves a dime-sized patch applied to everything from a crate of food to a missile. When a patch-bearing item goes through a door, the event is recorded and appears in a database. Similarly, the RFID device stores the information as well. As a result, an appropriately authorized person can tell exactly where a tank or missile is at any time. Similarly, anyone can poll the RFID tag to get a history of exactly where it's been and when.

I'm a marathon runner and I marvel at the simplicity of the tracking systems used for the races. Every runner has a unique RFID tag tied to a shoe; at key points throughout the race, the racer's passage is tracked. Anyone with Web access can track the splits of anyone running the Boston Marathon, for example. Similarly, the runner can review his or her times after the race because of the tracking system.

Now, consider using the same technology throughout the U.S. healthcare system, for patient tracking as an example. Most hospitals in the United States can't track patients with the precision or ease of access that I can have in tracking the progress of a runner in a typical marathon. Think of the benefit—in terms of room turnover, flow control, and overall process engineering—of knowing where patients are in the OR process (preop, in the OR, in recovery, back in the room). Given this real-time data, it would be possible to determine

when to clean the ORs, which OR teams are more productive than others, time per type of procedure, and other metrics. This is just one example of technologies that are available and used in other areas that have yet to be applied in a large scale to medical practices.

To your second question, I believe that the lag in applying other technologies is in part because physicians and healthcare organizations generally are jaded by new technology. For decades, vendors have promised physicians increased efficiency and time savings, and for decades physicians been disappointed. From a vendor's perspective, a physician is low-lying fruit for many technologies that have yet to be proven. Take voice recognition, for example. One of the first application areas of voice-to-text was medicine, in part because physicians could afford the technology. However, the technology is only now mature enough for some users to fully apply it to medical transcription. Although a few early adopters embraced the technology, it wasn't yet ready for mainstream use.

The challenge for physicians and IT departments is to identify which technologies are tried and true in other areas, and which are new and focused on the medical market simply because that's where the money is. To that end, it's important for a prospective buyer to keep up with the industry—through reading this and other journals, for example. The most common method of gaining information about the practical value of clinical support technologies is to ask for references, especially at a medical specialty meeting. Data gathering of this type is more helpful and less biased than calling a vendor's list of references, for example. Many vendors work extra hard to create a reference list, doing whatever it takes to make clinicians at the reference sites happy. Unfortunately, this level of support is typically not duplicated for the average clinician.

JHIM: Looking at e-health from a global perspective, how is the progress in e-health in the United States received? Will other countries choose to follow suit?

DR. BERGERON: On a recent trip to the Pacific Rim, I saw that a consistent message from those involved in deploying IT to the practice of medicine was that the methods used in the United States are too expensive and have an unknown ROI. In this sense, the United States is seen as a leader in wasteful expenditures on information technology in medicine. Based on my conversations with healthcare technology leaders in Japan, Korea, Singapore, Hong Kong, and Kuala Lumpur, I'd say the consensus is that U.S. physicians have many unproven, costly distractions, and they view following suit with guarded skepticism.

JHIM: In the February 2001 issue of *Healthcare Informatics*, there was a list of nine hot trends for the year 2001: data security, wireless, ASPs, integration, disease management, workflow, customer relationship management, supply

chain management, and convergence. What is your reaction to this list? Do you have thoughts on any of these areas as they apply to e-health?

DR. BERGERON: I think the list is representative of the plans currently in place at many hospitals. Data security, integration, workflow, disease management, and convergence have been at the forefront of many IT lists for several years. More recently, wireless, ASPs, workflow, CRM, and supply chain management have received increased attention.

Progress in each area isn't dependent only on technology, but on issues of politics, funding, and end-user acceptance as well. For example, consider CRM, which is typically a high-cost proposition with very little immediate ROI. As most dot coms have realized, providing a Web-enabled touch point may generate many leads and even relatively healthy sales. However, supporting customers through traditional means is very expensive—on the order of seven dollars per minute. In terms of cost savings, many companies outsource CRM functions to an outside vendor working with a CRM warehouse of sorts, maybe located in the Midwest or even India.

Although outsourcing CRM may result in short-term cost savings, relative to a local CRM support effort, the quality of the support, as measured in patient loyalty, is typically lower than what one would normally expect from a local CRM effort. The difference is in emotive content, intimate understanding of the processes and systems, and familiarity with the physical plant, in comparison to someone who knows about a specific healthcare institution only from a manual.

One answer to the CRM issue is to have local support, but provide software triage agents who can handle most of the support questions, leaving local human operators to take the more difficult issues. Technologies such as bots [software robots], NLP [natural language processing], realistic TTS [text to speech], and expert systems [software packages that act on user-supplied rules for their behavior] are making virtual CRM a reality.

JHIM: Since a number of healthcare IT surveys indicate that funding continues to shrink for many organizations as well as practices, which investments in e-health create the greatest value in offering enhanced patient care, given the cost pressures?

DR. BERGERON: That depends on how you define enhanced patient care, and the time scale. For the sake of this discussion, let's assume a relatively short-term investment-outcome cycle and a patient's perspective on the problem. If you ask a typical patient sitting in a waiting room what change(s) would make her happy, she'll probably not mention decision support systems or system integration, but instead extended, or otherwise enhanced, access to her healthcare provider. That is, anything that can result in increased, old-fashioned, patient-physician contact time brings value to the patient-physician

relationship. Patients who trust and bond with their primary care provider are much more likely to follow a prescription and, in general, become more involved in their healthcare.

In other words, any technology that saves the physician time is the greatest value for providing enhanced patient care. Investments in, say, data security and supply chain management have less of a short-term effect on time savings compared to adding a wireless link to the patient's electronic medical record that can be referred to unobtrusively while the patient and physician are meeting. Of course, over the long haul, investment in infrastructure, such as a fiber optic backbone for radiology image transfer and for supporting access to an EMR, is likely to offer the highest return on investment.

JHM: If you look out over the next twelve to twenty-four months, what do you see as the major e-health trends and challenges?

DR. BERGERON: Over the next two years, the major trend in the communications and computation industries in general that will directly affect the practice of medicine is a move from invasive to pervasive computing and communications. In this regard, invasive computing is typified by the desktop computer or terminal. A physician has to find a terminal in order to check a patient's lab values, for example. Pervasive computing, in contrast, recognizes the physician's everyday work processes. A wireless PDA can permit any-time, any-place access to patient data.

One component of pervasive computing is continuation of the time and space compression brought about by wireless technologies. A real-time patient alert, communicated through a wireless system, for instance, can supply a physician with critical time-dependent information when he needs it most. Similarly, from the patient's perspective, consider the value of having blood glucose or weight communicated, in real time, to the physician's database. Although some of these pervasive computing and communications capabilities may have a touch of big brother about them, for a patient with a critical medical condition giving up a bit of privacy is a small price to pay for medical care.

A major challenge, one that will become evident in the next two years, is related to realizing that the increasing quantity of digital data collected on patients is more volatile than suspected. Not only will the challenge of managing these increasingly large pools of data become evident, but the enormous challenge associated with keeping the data archived and accessible for decades into the future will become evident as well.

As you can see, this interview provided some interesting observations about e-health and the challenges of the road to come. In spite of these challenges, it is clear that the evolution of e-health is a process by which technologies and information systems can complement the requirements of

healthcare delivery professionals. No time in the history of our industry has been quite as exciting yet fraught with potential dilemmas over separating fact from fancy. Nevertheless, it is clear that each healthcare organization will define and deploy the solutions that best mirror its strategic priorities and those of the patient population it serves. We hope you can benefit from the information provided by the contributing authors as you and your organization find the vehicle and solutions for delivering on the vision of e-health that has been crafted to your particular specifications.

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## Notes

1. "Close-Up on E-Health." *ADVANCE for Health Information Executives*, May 2001, pp. 32–34, 36.
2. If you are interested in reading a sampling of Dr. Bergeron's writings, please refer to the following:
  - "The Future of the Web in Healthcare." *ADVANCE for Health Information Executives*, Dec. 1998, pp. 30–36.
  - "Hot Technologies for 2000 and Beyond." *ADVANCE for Health Information Executives*, Feb. 2000, pp. 28–32.
  - "Letters to the Editor." *ADVANCE for Health Information Executives*, June 2000, p. 25.