How to Grow A Rural IT Network

STEPS ALONG THE WAY

BY PAUL BROWNE, M.S.H.A.

In the summer of 2008, seven of Trinity Health's critical access hospitals, scattered across hundreds of miles of farmland in north Iowa, successfully launched the nation's first rural integrated electronic health-record network. The system's bells and whistles feature computerized physician order entry, a host of clinical decision support tools and — of course — a comprehensive electronic health-record system.

Such high-tech applications and devices increase quality of patient care and safety, yet our industry overall has been slow to adopt them. The federal government's American Recovery and Reinvestment Act of 2009 includes billions of dollars in Medicare and Medicaid incentives to providers and hospitals for the meaningful use of certified health information technology products by 2013. That economic stimulus package certainly has catalyzed health systems throughout the nation, but they usually launch their technology innovations in urban settings first.

Rural America's residents represent 21 percent of our nation's population,[1] yet the U.S. Department of Agriculture's August 2009 study, *Health Status and Health Care Access of Farm and Rural Populations*, reports that rural Americans have less access than their urban counterparts to affordable, nearby, high-quality health care. It also notes that adoption of health information technology and quality indicators have great potential to improve care coordination among geographically dispersed providers.[2]

Only 1.5 percent of U.S. hospitals have a comprehensive electronic health-record system, according to a *New England Journal of Medicine* study published in April 2009.[3] To qualify for "comprehensive" status, hospitals had to meet a list of technological requirements, including computerized physician orders and nursing assessments, clinical decision support tools, clinical reminders and automatic alerts to prevent adverse drug events.

Trinity Health's seven rural access hospitals in Iowa are now in this group. They are improving the quality and safety of rural patient care and providing equity in access to the communities they serve. They also have generated significant organizational learning about the effectiveness of electronic health-record implementation in rural hospitals. It was a journey to get there, but ours can serve as a road map for other health systems looking to deliver 21st century care to patients located in remote areas of the nation.

LAYING THE FOUNDATION

Trinity Health was formed through a merger of two health systems in May 2000, not even a year after the Institute of Medicine's call to arms, "To Err is Human: Building a Safer Health System," was published. After the merger, our entire organization committed to heeding the Institute of

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Medicine's recommendations. From a technology standpoint, though, we were functioning with an inherited network reminiscent of a patchwork quilt. It was a mishmash of hardware platforms, legacy systems and vendors. We would never reach our goal of achieving system-wide electronic health record keeping unless we standardized all of our vendors and applications, as well as the management of them.

Standardization is not for the faint of heart, but it is vital to laying the foundation for a comprehensive electronic health-record network. There will be financial and cultural challenges, whether an organization spans several states, is a regional system or comprises one or two facilities. I strongly encourage adopting a "pay-now-or-pay-more-later" viewpoint: Trinity Health's initial investment allowed us to effectively leverage our size and available resources, maximize our influence on current software functionality and future development, as well as minimize our costs in the future.

Keep also in mind — and heart — our Catholic mission, which compels us to provide the best health care to everyone, no matter where they are.

A PHASED APPROACH

Developing a methodology that would lead to implementation was the next leg of our journey. IT guy that I am, Metcalfe's Law became my personal North Star. It states that the value of a telecommunications network is proportional to the square

of the number of connected users of the system. In other words, one guy with a cell phone isn't very useful. Two people with cell phones can be beneficial. Provide an entire community with cell phones? Priceless.

But merely equipping our hospitals with cell phones, i.e., electronic health-record systems, wasn't enough. We wanted to create a large net-

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BUILDING ON THE ELECTRONIC HEALTH-RECORD SYSTEM: 24-HOUR PHARMACY SUPPORT

Six months after "Go-Live," Trinity Health's seven rural hospitals activated a bar code medication administration tool. But unlike stand-alone bar coding, this tool works within the electronic health-record system and combines the safety of computerized physician order entry with the safety of bar code medication administration. This ensures a paperless medication loop, a goal set by the government for all U.S. hospitals. The loop helps provide the highest levels of accuracy and safety from the time of the medication's order to the bloodstream.
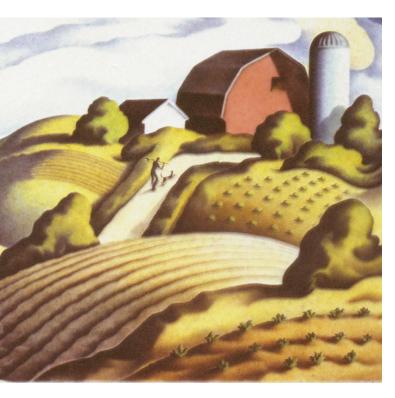
In order for the loop to be 100

percent effective, however, it requires 24-hour pharmacy availability. So when the pharmacies are closed at the seven rural hospitals, pharmacists at Trinity Health's Mercy Medical Center-Dubuque hospital, hundreds of miles away, handle the medication verification. Sixteen hours each day and throughout the weekend, they verify 100 percent of the rural site orders, allowing Trinity Health to extend the utmost in medication safety to some of its least resourced facilities.

With Mercy-North Iowa in Mason City also offering back-up remote verification, these hospitals form a

pharmacy support network. This would serve an especially critical need in case of a power outage, flu epidemic or natural disaster, such as the widespread flooding that devastated northeastern Iowa in June 2008.

If patients at any of these sites needed to be evacuated and/or relocated, their wristbands could easily be scanned at a sister hospital with this technology. As long as caregivers have access to the electronic health-record system, they can provide continuous care to patients — whatever may occur.

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We determined that a phased approach would be best, and that is still used today.[4] Phase One installs a central clinical data repository; interfaces for dictated reports, drug administration records, lab results, a results viewer and a rules package for adverse drug events. To date, all of our hospitals function with this technology, with the exception of four recent acquisitions.

Phase Two — known as Go-Live — launches a suite of clinical applications that automates functionality in the pharmacy, emergency room and patient floors, as well as a master person index to establish unique patient identifiers. This phase activates with a "big bang," meaning we bring down all existing IT systems and convert them over the course of a single weekend while patient care continues throughout the hospital.

In addition to phased software installation, our strategy features other readiness components, such as clinical workflow redesign, organizational restructuring, multiple training cycles, pre- and post-measurement tools, as well as change management. The latter focuses heavily on physicians and clinicians; their "ownership" of the new electronic-record system is vital to any hospital's permanent adoption.

Applying this model in a systematic process with standardized applications and designs, Trinity Health first launched its comprehensive electronic health-record system in May 2003 at St. Joseph Mercy Port Huron Hospital in Port Huron, Mich. Five more of our Michigan sites went live over the next two years, expanding our database and capabilities as a network each time.

REACHING THE HEARTLAND

In July 2005, our sixth Go-Live occurred at Mercy Medical Center-North Iowa in Mason City. This established a gateway for us to develop the nation's first rural integrated electronic health-record network because the seven critical access sites are affiliated with Mercy-North Iowa.

Most rural hospitals their size do not have access to affordable electronic health-record solutions, let alone ones located in rural America. Solutions that do manage to meet a modest budget are usually stand-alone models unable to offer the capabilities provided by a comprehensive system. Additionally, small rural hospitals tend to offer a limited range of specialized services and providers. This can result in patients needing to travel greater distances for follow-up care, or forgoing follow-up altogether.

Digitizing our seven small sites would place a massive amount of clinical intelligence and expertise at the fingertips of those rural caregivers. For instance, any Trinity Health physician or clinician with access to our system can use hundreds of industry-leading, evidence-based order sets. These online support tools provide the most current medical evidence, links to other tools and literature and specific rules, alerts and strategies that assure patient safety and quality. Also, patients seen in those rural facilities and in need of follow-up care in Mason City would have their information already housed in our system. This would promote follow-up care and streamline transfer handoffs.

Encouraged, our efforts continued over the next three years to bring our electronic-record system to these small communities. We implemented seven more large-scale Go-Lives in Iowa, Michigan, Indiana and Maryland along the way.

COLLABORATION THE KEY

If hard wiring Mercy-North Iowa was our gateway to rural America, then collaboration was the key. Trekking the IT route had shown us time and again that the best way to overcome barriers is through partnership. Be they financial, techno-

logical, geographic, organizational — or a combination — barriers exist, no matter the size of the health system. Trinity Health encourages collaboration as much as possible; with colleagues, government agencies, grants, schools, insurance companies, providers, purchasers, we formulated teams to get this important work done.

The Agency for Healthcare Research and Quality facilitated our initiative through two grants. The first supported planning efforts between Mercy-North Iowa, its rural hospital affiliates and county public/community health agencies to develop standard protocols and procedures. This allowed sharing of patient data and ensured integration with Trinity Health's electronic health-record system.[5] The second grant supported a partnership between Mercy-North Iowa, the seven critical access sites, Trinity Health and the University of Iowa to implement a comprehensive, integrated electronic-record system and to generate lessons for future implementations in other rural settings.

With our team, resources and technology aligned, we applied our readiness methodology to these seven sites and successfully activated our system during the summer of 2008. We created the nation's first rural integrated electronic health-record network. As of May 31, 2010, the seven rural hospitals have created electronic records for 82,606 patients who have had 623,585 unique encounters. Advancing their quality of care and safety has advanced our mission.

CONTINUING THE JOURNEY

While the new health reform legislation does not provide federal funding specifically for health IT, it does provide monies for health systems interested in participating in demos and pilots on innovative care delivery models. The reform legislation will penalize providers that do not achieve certain quality benchmarks around readmissions and hospital-acquired conditions.

Today, Trinity Health has well over 7 million unique patient records in its system. Our early adoption of a comprehensive electronic health-record system has contributed to the high-quality outcomes of care at our hospitals. This performance level and access to patient data also gives us an advantage in achieving the quality benchmarks and seeking federal funding for pilots and demos.

Having one of the nation's largest health databases, we are able to leverage the power of our system in incredible ways, such as when breakthroughs in medicine occur. With the onset of the H1N1 outbreak last year, we were able to rapidly provide order sets for weight-based pediatric dosing of Tamiflu within two days of the Centers for Disease Control and Prevention's issuance of guidelines. (We provided order sets on paper to our sites that were not yet "live.") We can also track the distribution of Tamiflu and identify providers who come into contact with H1N1 patients and may need prophylactic treatment.

The foundation of our system has been laid. Future building includes going live at our remaining sites by 2013, as well as upgrades that will advance care in areas such as obstetrics, surgery and nursing workflow.

My faith and fascination with history often intermingle with my modern-day work. Trinity Health recently celebrated 10 years as a health system, yet I am reminded daily that it is a ministry of the ancient church — Jesus' healing ministry that primarily focused on the poor, the forgotten and the underserved. Carrying on that ministry, Trinity Health's founders, the Sisters of the Holy Cross and Sisters of Mercy, came to America and traveled westward in the 1800s to found hospitals across the country that provided care "to the least of these." Now Trinity Health continues their pioneering legacy by bringing health information technology to rural America.

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NOTES
1. U.S. Census Bureau, United States — Urban/Rural and Inside/Outside Metropolitan Area GCT-P1. Urban/Rural and Metropolitan/Nonmetropolitan Population: 2000, Data Set: Census2000Summary File 1 (SF 1) 100-Percent Data, http://factfinder.census.gov/.
2. United States Department of Agriculture; Economic Research Service; *Economic Information Bulletin Number 57*; Carol Adaire Jones et al., "Health Status and Health Care Access of Farm and Rural Populations" (August 2009).
3. Ashish K. Jha et al., "Use of Electronic Health Records in U.S. Hospitals;" *New England Journal of Medicine* 16 (April 16, 2009): 29-38.
4. Donald Crandall et al., "Redesigning Care Delivery through Health IT Implementation — Exploring Trinity Health's IT Model." *Journal of Healthcare Information Management* (Fall 2007): 41-48.
5. Crandall.

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