



Louisiana Rural Health Information Exchange: The Impact of Smarter Healthcare

WHITE PAPER

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EXECUTIVE SUMMARY

In the summer of 2005, the Gulf Coast region was devastated by back-to-back hurricanes — Katrina and Rita. Hospitals in New Orleans were underwater, severely damaged, and ultimately shuttered for a year or longer. Patients from the coastal regions were referred to Louisiana State University Health Sciences Center in Shreveport (LSUHSC-S), more than 700 miles away round-trip. The LSU Hospital System is the state's charity system serving the underinsured and uninsured population. As a result, LSUHSC-S became the only Level I trauma center serving the region's uninsured population, and occupancy consistently ran over 100%.

The chancellor of LSUHSC-S reached out to the Louisiana state senate president at the time for help in finding a solution to overcrowding in the hospital. Together, along with the executive director of the Louisiana Rural Hospital Coalition (RHC), a lobbying group for 44 rural hospitals, they conceived of the idea to establish the Louisiana Rural Health Information Exchange (LARHIX) that would facilitate collaboration between LSUHSC-S and the rural hospitals by enabling continuing medical education, specialty consultations for patient care, and health information technology. The original objectives were to:

- Avoid unnecessary transfers and duplicate tests
- Shorten length of stay at the medical center
- Treat patients locally when and where possible

Formed in 2007, LARHIX is a partnership between the Louisiana RHC and the LSU Hospital System and currently consists of 26 RHC member hospitals in central and northern Louisiana and the LSU tertiary hospital in Shreveport. Most of these hospitals are small or critical access hospitals that had not yet implemented hospital information systems (HIS). Many of the LSUHSC-S inpatient admissions are rural patients whose underinsured and uninsured status leads to poor health and untreated chronic conditions. Often, they put

off care until their health issue becomes catastrophic and they require an emergency room visit and are subsequently admitted to a tertiary care hospital hundreds of miles away.

The services provided by LARHIX include the following:

- Electronic medical records (EMRs), picture archiving and communication systems (PACS), and financial systems will be implemented at all 26 rural hospitals.
- Connectivity to Carefx's clinical portal, Fusionfx, provides secure access to 1.1 million patient records and enables health information sharing among the rural hospitals and LSUHSC-S. LARHIX's interoperability platform is built on the IBM Health Integration Framework, which also includes IBM Initiate Patient, an enterprise master patient index (EMPI) technology, and IBM WebSphere's portal technology, among other technologies.
- Videoconferencing equipment from Polycom has been installed at LSUHSC-S and all 26 rural hospitals to enable teleconsultations; patient education on topics such as diabetes, wound care, and diet; and distance learning for clinicians.
- A mammography van provides mammograms to underinsured and uninsured women and real-time results reporting at the conclusion of their appointment.
- An Internal Medicine Residency program will rotate six third-year residents from LSUHSC-S through rural physicians' offices and hospitals.

LARHIX has been very successful by all accounts, as evidenced by the benefit metrics carefully analyzed and reported by the state's only fully operational health information organization (HIO). LARHIX measured savings in terms of days to appointment (97), average miles traveled (278), hours spent traveling and waiting room time (5), as well as travel expenses for the patient (\$167).

Key lessons learned cited by LARHIX's executives included the importance of engaging physicians in the process, defining the value proposition for stakeholders, and promoting the project to the end users. LARHIX recognized early on that "one size does not fit all." This lesson learned applied to multiple aspects of the project, including the decisions to allow the hospitals to select their own EMRs, rather than restricting the choice to the short list of vendors developed by LARHIX, and to implement a federated data model, thereby allowing hospitals to retain control over their data to mitigate data governance issues. Health information exchanges (HIEs) should carefully evaluate different models for data, governance, and privacy and select the models that work best for their unique technical, business, and clinical needs.

97 — average number of days patients save in getting an appointment with a specialist at LSUHSC-S

98% — percentage reduction in duplicate tests per patient

156 — average number of minutes saved in waiting room time

278 — average number of miles patients save in travel

\$167 — average travel amount patients save

3 — average number of hours patients save in travel time

5 — average number of hours patients save in combined travel and waiting room time

85% — approximate percentage increase in access to primary and specialty care

\$1,000 — typical savings per patient visit from avoiding an emergency room visit

LARHIX is on track to continue deployment of EMRs to the remainder of the hospitals in northern and central Louisiana. As these hospitals come online with EMRs and other clinical information systems, they will be connected to the LARHIX interoperability platform. The focus of LARHIX has always been on patient care and making better care available to patients who would not have access to care otherwise. "It's not an IT project, but a patient project," wisely noted Jamie Welch, CIO of LARHIX.

IN THIS WHITE PAPER

This IDC Health Insights white paper, sponsored by IBM, presents the findings of in-depth interviews conducted with senior executives at LARHIX and a clinician at LSUHSC-S. The objectives were to gain insights into:

- The industry transformation surrounding a smarter healthcare culture
- The clinical benefits and business value that can be derived from implementing a smarter healthcare strategy

SITUATION OVERVIEW

A strong correlation exists between health status, education, and income. Not surprisingly, given the high rates of poverty — close to 24% of Louisianans live below the poverty line — Louisiana consistently ranks among the lowest states for a variety of health status and economic indicators. Table 1 presents major health and economic indicators for Louisiana compiled by America's Health Rankings. Overall, Louisiana ranked 47th in 2009, up two spots from 49th in 2008, according to America's Health Rankings. (Neighboring Mississippi ranked 50th in 2008 and 2009.)

Poor health status is not systemic to Louisiana or other states in the Gulf Coast region slammed by the natural and man-made disasters of hurricanes in 2005 and the Gulf of Mexico oil spill in 2010. Approximately 50 million people (1 in 7) live in "rural America," where there are higher rates of poverty, uninsurance, and chronic diseases.

TABLE 1

Major Health and Economic Indicator Rankings for Louisiana

Indicator	2009 Percent of Population	2009 State Rank	2008 Percent of Population	2008 State Rank	2009 Percent of Population of #1 State (State)
Overall	–	47	–	49	(VT)
Obesity	29%	37	31%	47	19.1% (CO)
Diabetes	11%	47	10%	44	5.9% (MN)
High blood pressure	32%	46	32%	46	19.7% (UT)
High school graduation	60%	49	64%	46	87.5% (WI)
Lack of insurance	19%	47	20%	47	5.4% (MA)

Note: Louisiana was ranked 48th in median household income in 2009 with \$39,563 and 46th in 2008 with \$42,900. New Hampshire was ranked number 1 in median household income in 2009 with \$66,176.

Source: America's Health Rankings, 2009

Access to quality healthcare is limited for many rural Louisianans. There are 1,925 patients for each physician in rural Louisiana (more than twice the 870:1 ratio in the state's urban areas). Only 12.8% of Louisiana's licensed physicians practice in rural areas.

After Hurricane Katrina, nearly 6,000 practicing physicians in the Gulf Coast region were displaced. All healthcare facilities were shut down in New Orleans, and specialty care was rerouted to Louisiana State University Health Services Center in Shreveport (LSUHSC-S). The LSU Hospital System is the state's charity system serving the underinsured and uninsured population. As a result, LSUHSC-S became the only Level I trauma center serving the region's uninsured population, and occupancy consistently ran over 100%.

In search of a solution, the chancellor of LSUHSC-S reached out to Donald Hines, M.D., the Louisiana state senate president at the time, who referred him to the Louisiana Rural Hospital Coalition (RHC), a consulting and lobbying firm serving 44 member hospitals that have 60 or fewer beds. Together they formed the Louisiana Rural Health Information Exchange (LARHIX) with the original objectives to:

- Avoid unnecessary transfers and duplicate tests
- Shorten length of stay at the medical center
- Treat patients locally when and where possible

To achieve these objectives, LARHIX created a network to enable collaboration between LSUHSC-S and the rural providers to provide continuing medical education, specialty consultations for patient care, and health information technology.

LOUISIANA RURAL HEALTH INFORMATION EXCHANGE

Overview

Formed in 2007, LARHIX is a partnership between the Louisiana RHC and the LSU Hospital System that currently consists of 26 RHC member hospitals in central and northern Louisiana and the LSU tertiary hospital in Shreveport. Hospital ownership ranges from private to public to parish owned. LARHIX started with these 26 hospitals because LSUHSC-S can provide technical services for telemedicine only over a certain distance. Ultimately, LARHIX will expand to include all 44 RHC hospitals and 10 teaching hospitals.

The Approach

The major components of the LARHIX project include:

- **Complete hospital information systems in the rural hospitals.** Seven hospitals a year will be brought online until all 26 hospitals have electronic medical records (EMRs), picture archiving and communication systems (PACS), and financial systems.
- **A clinical portal.** Once each hospital has implemented its EMRs and other clinical information systems, it is connected to Carefx's clinical portal, Fusionfx, which enables the sharing of patient health information between the rural hospital and LSUHSC-S, as well as among the other rural hospitals connected to the network. Fourteen hospitals, including LSUHSC-S, are now using the LARHIX Clinical Portal, which provides access to 1.1 million patient records.
- **Telemedicine, teleconferencing, and distant learning system.** In the first year, all 26 rural hospitals were equipped with videoconferencing, which enables patients to be treated locally and provides continuing education for clinicians and patient education on topics such as diabetes, wound care, and diet.

- **A mobile mammography van.** Louisiana ranked 47th in breast cancer deaths, with 26.5 deaths per 100,000 women, in 2006 (the latest year data is available), according to the National Cancer Institute, State Cancer Profiles, Death Rate Report by State. The mammography van is completely outfitted to provide mammograms to underinsured and uninsured women and real-time results reporting so that patients know whether they need to be referred to LSUHSC-S for specialty care at the conclusion of their appointment.
- **An Internal Medicine Residency program with an emphasis on rural medicine.** Six third-year residents from the LSUHSC-S program will rotate through rural physicians' offices and hospitals. The objective of the program is to encourage physicians to practice primary care in rural regions of Louisiana.

Business Drivers

The key business and clinical drivers that led RHC and LSUHSC-S to form LARHIX are the same drivers that compel other healthcare organizations to collaborate and establish a health information exchange; that is, reducing costs by eliminating redundant services and providing care in a lower-cost care setting (the local hospital versus the more expensive tertiary hospital), along with improving health outcomes by increasing access to care (e.g., reducing wait times for an appointment, travel time to get to the appointment), patient compliance, and better monitoring of patients with chronic conditions.

While the LSU hospital in New Orleans did reopen in mid-2006, it is delivering only a quarter of pre-Katrina services from an interim building. To this day, LSUHSC-S continues to carry a tremendous patient load. Most of its inpatient admissions are rural patients whose poverty leads to poor health. If employed, they have low-paying jobs, and are either underinsured or uninsured. They cannot afford skyrocketing insurance premiums, but they do not qualify for Medicaid. Consequently, they put off routine care until their health issue becomes catastrophic and they either require an emergency room visit or are admitted to the hospital. Louisiana ranks third in the nation for emergency room usage and fourth for hospital admissions. "Early intervention is critical in the practice of medicine, and access is the number one thing," noted Dr. Hines, executive director of LARHIX and a practicing physician.

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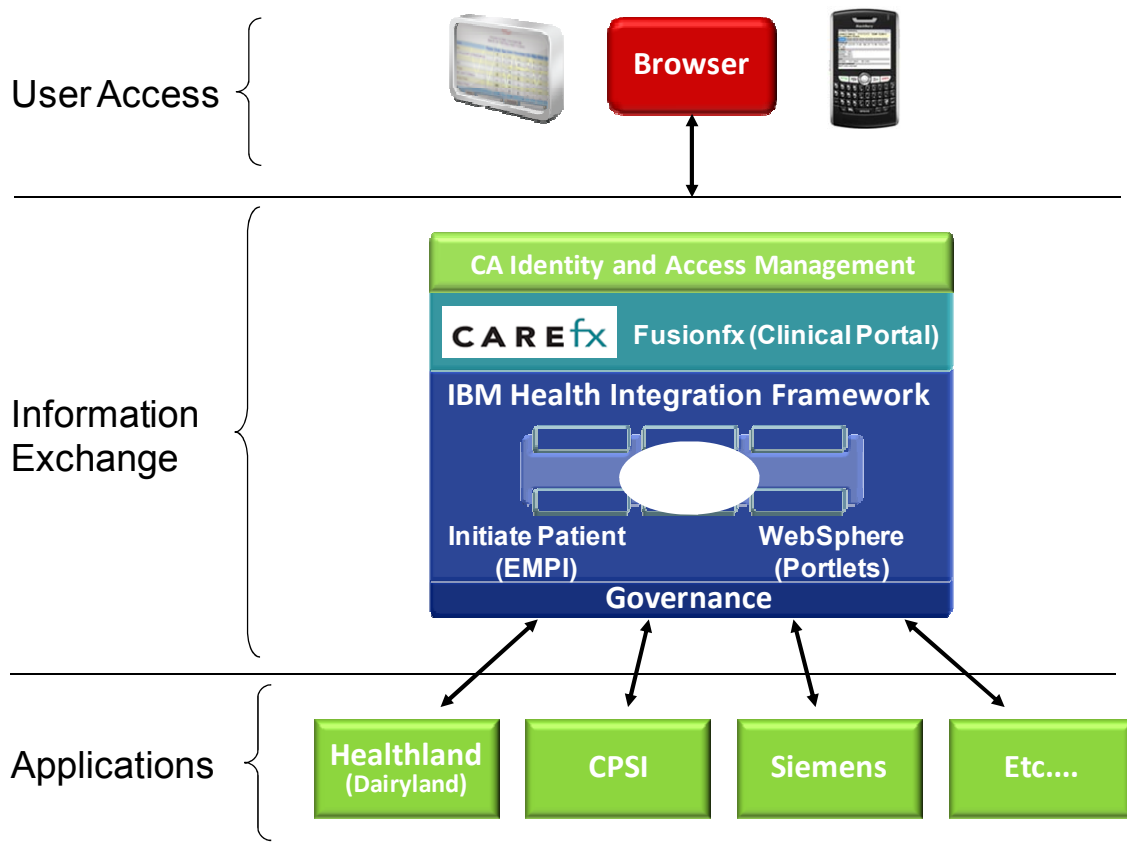
Thus, the goals of LARHIX are to extend healthcare to underserved areas using information technology to improve access to care, collaborate with other clinicians via teleconsultations and access to electronic patient records, and manage chronic conditions more effectively. The LARHIX Clinical Portal will also enable the creation of medical homes for rural patients within their own community.

Solutions Description

The LARHIX interoperability solution is built on the IBM Health Integration Framework (HIF), a unified software platform based on healthcare industry standards that supports IBM and business partner solutions and applications, such as Carefx's clinical portal, Fusionfx (see Figure 1). The IBM Health Integration Framework allows LARHIX to leverage existing (or newly installed) business and clinical applications and processes for faster deployment. Benefits of HIF include flexibility of application and technology choice; speed to value through reuse of design templates, workflows, and common services; and the opportunity to leverage best practices gleaned from many other IBM client engagements over many years while reducing cost and risk.

FIGURE 1

The LARHIX Model



Legend: ■ IBM components ■ Carefx ■ Third-party applications

Source: Louisiana Rural Health Information Exchange, 2010

Fusionfx has been HIF validated, complying with industry standards and integrating properly with other HIF components. Fusionfx features a federated data model, thus allowing each participating hospital to retain data ownership and control of its patients' health records. In addition, Fusionfx leverages IBM WebSphere portlet technology to present a unified view of patient data aggregated across multiple disparate systems installed at the participating hospitals without centralizing the data. IBM Initiate Patient provides the enterprise master patient index (EMPI) technology to correctly identify matching patient records across the LARHIX network. CA Technologies provides the security infrastructure, including identity and access management and secure proxy servers. The LARHIX architecture is designed to scale to support growth and disparate levels of technology found in a statewide exchange.

LSUHSC-S hosts the datacenter for the LARHIX platform, which has 36 servers and is staffed by two IT staff members who provide technical support for the SaaS-based HIE technology.

LARHIX contracted with AT&T to install 26 point-to-point T1 lines that create a virtual private network to connect all of the RHC hospitals for telemedicine services. Data and telemedicine transmissions utilize their own dedicated lines so that the intensity of the telemedicine traffic doesn't degrade the performance of the hospitals' Internet access points. LARHIX contracted with Wire One Communications (now owned by BT Conferencing) for videoconferencing services. The equipment is from Polycom.

How It Works

Each rural hospital is equipped with a videoconferencing device from Polycom. At LSUHSC-S, there are 7 videoconferencing machines around the campus, and 80 physicians are credentialed to conduct teleconsultation visits. Participating LSUHSC-S specialists allocate between 3 and 4 hours a week for teleconsultations with rural physicians and their patients. Telemedicine consultations are available for cardiology, pulmonology, gastroenterology, oncology, endocrinology, and nephrology. On average, 18 telemedicine visits are conducted weekly between LSUHSC-S and the rural hospitals across the various specialties. Figure 2 depicts a clinician using the Polycom videoconferencing device. The left image shows an exam view, and the right image shows a close-up view using the skin camera.

FIGURE 2

Telemedicine: Exam and Skin Camera Views



Source: Louisiana Rural Health Information Exchange, 2010

Nurse practitioners working with the specialists use the clinical portal to look up lab results and images before the teleconsultation or afterwards if the specialist has ordered them as part of the consult. Prior to implementing the clinical portal, rural hospitals faxed lab results and medical records to LSUHSC-S. Images were mailed, couriered, sent by overnight delivery, or carried by the patient. The volume of paper could be overwhelming at times, and often patient records could not be found in time for appointments. Now this information is at the clinicians' fingertips.

Funding LARHIX

RHC successfully lobbied for \$17.5 million in funding from the Louisiana state general funds budget during the 2007 regular legislative session. Returning the next year, RHC convinced Governor Bobby Jindal to include the LARHIX project as part of the governor's executive budget with a baseline of \$11.1 million. LARHIX lobbied for and received another \$8.5 million as a line item in the state general funds budget.

LARHIX will continue to see state funding for the project. However, state budgets are extremely constrained given the combined impacts of the global economic crisis and the Horizon Deepwater oil spill that has further devastated the economy of the Gulf Coast region. Funding has been limited to \$1.9 million in appropriations for administrative and maintenance activities, thus temporarily limiting expansion plans beyond the current 26 hospitals. The cost for maintaining the network for both videoconferencing services and the clinical portal is less than \$6,000 per hospital per month, which LARHIX estimates could be covered easily by the hospitals from the cost savings from implementing PACS.

Selecting the Solutions

LARHIX issued separate RFPs for hospital EMRs, health information exchange/Web portal, and telemedicine/distance learning. Vendors were carefully evaluated to create a short list of vendor options. In the case of hospital EMRs, LARHIX recognized that one size did not fit all and gave the rural hospitals the option to implement one of the EMR applications on the short list or use another vendor product if they chose. Among the first seven hospitals, three different vendors were selected, including one vendor not on the LARHIX short list. LARHIX thought it was important that the participating hospitals feel comfortable with their choice of HIS vendors and thus did not require them all to select the same vendor or restrict their choice to the short list.

LARHIX reviewed more than 20 vendors representing various HIE technology components, many of them major players in the marketplace today. A key selection criterion was support for a federated data model. Vendors that provided only centralized data models (at the time) were eliminated from consideration because LARHIX realized early on that it would not be able to reach consensus among the hospitals on standardizing data definitions (e.g., what a normal range for a specific lab test) or policies (e.g., whose information request should take priority or which institution has the best HIPAA policy). Thus, data governance and policy debates, which typically derail HIE efforts, were essentially sidestepped. LARHIX selected Carefx for its federated data model, portlet views into the participating hospitals' systems, and ability to implement Carefx's Fusionfx clinical portal quickly. As a result of these capabilities, Fusionfx went live in four months.

In addition to evaluating EMPI technology from Initiate Systems (which was acquired by IBM in 2010), LARHIX assessed EMPI technology developed by some of the HIE vendors under consideration and bundled into their product offering. LARHIX selected Initiate Patient because it was at the time, and still is today, according to LARHIX's Welch, the gold standard for EMPI technology. Initiate Patient's federated style hub correctly identifies the patient at the point of care for both the telemedicine services and clinical portal and links records across systems regardless of their formats. HIPAA compliance is ensured because only certain data is shared with trusted entities, and patient registries are tracked at each hospital location to determine who accessed which patient records.

LARHIX has been satisfied with the technology choices made several years ago. When LARHIX's Welch was asked if she would do anything differently if she were making a system selection today, she replied, "Even several years into it, if I had to go back out to an RFI and RFP and choose another set of vendors, I am 99% sure that I would end up signing contracts with the exact same set of vendors."

Business Value

By all accounts, LARHIX has been a huge success. Patient and physician satisfaction is quite high. The telemedicine consultations are a major factor driving not only positive satisfaction levels but also improved access to care, compliance, and patient outcomes while reducing costs incurred by the hospitals and patients.

Improved Patient Access to Specialty Care

Long distance travel to receive specialty care in tertiary settings is a major burden for rural, and mostly poor, patients. Before telemedicine services were available, patients referred to specialists had to drive potentially hundreds of miles round-trip to LSUHSC in Shreveport. Such a trip would require a day off from work and lost wages for the patient and/or caregiver. It could take between 3 and 4 months to obtain an appointment with an LSUHSC specialist; the average wait time for an appointment was 117 days. More often than not, patients would not keep their appointments because they did not have transportation, could not afford the time off from work, or felt that the health crisis had passed and that they didn't need to see the specialist. In extreme cases, patients became sicker and were either seen in the emergency room or admitted to the hospital. Tests and imaging were often repeated due to the lag time between the initial appointment and specialty consult. LARHIX estimates that if patients waited the 3 to 4 months to be seen, 90% of the cases ended up in the emergency room.

Today, in a matter of a couple of weeks (versus several months), patients can make appointments for teleconsultations via videoconferencing between LSUHSC-S specialists and their physician at the local hospital. Physicians allocate three to four hours to make themselves available via teleconferencing. Appointments for these open teleconsultation slots can be made faster than conventional face-to-face appointments. Patient no-show rates have dropped to less than 10%, which is quite good for an indigent population.

Lab tests and imaging ordered by the LSUHSC-S specialist are performed locally, thus creating a revenue stream for the RHC-member hospital and alleviating some pressure on burdened laboratory and radiology/imaging services in Shreveport. Specialists use the LARHIX portal to view lab results and images along with the patients' electronic health records. The benefits are truly remarkable:

- 97 — average number of days patients save in getting an appointment with a specialist at LSUHSC-S
- 98% — percentage reduction in duplicate tests per patient
- 156 — average number of minutes saved in waiting room time

- 278 — average number of miles patients save in travel
- \$167 — average travel amount patients save
- 3 — average number of hours patients save in travel time
- 5 — average number of hours patients save in combined travel and waiting room time
- 85% — approximate percentage increase in access to primary and specialty care
- \$1,000 — typical savings per patient visit from avoiding an emergency room visit

Patient Safety

Patient safety starts with correctly identifying the patient. IBM Initiate Patient creates patient-centric views using a federated style hub to match patient records across LSUHSC-S and the rural hospitals served by LARHIX. Figure 3 presents the IBM Initiate Patient search screen, which supports search by patient ID number or by patient name plus key demographic information (e.g., date of birth, zip code, and gender).

FIGURE 3

Patient Search — IBM Initiate Viewer

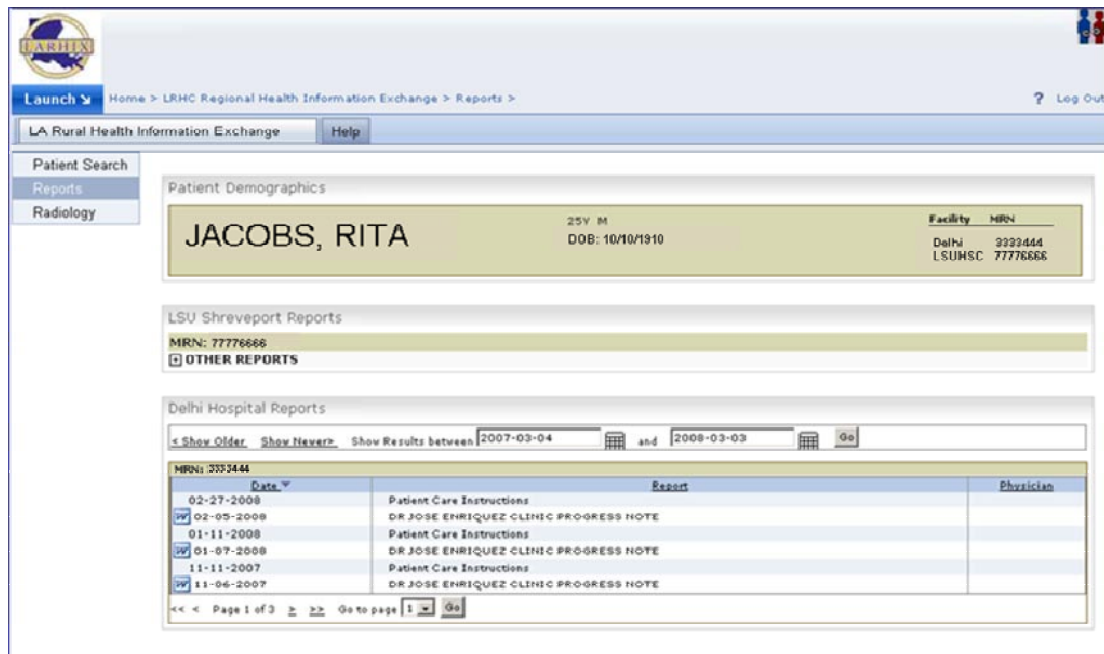
LIST Name	First Name	DOB	Age	Gender	SSN	Zip Code	MRN	Facility (long name)
JACOBS	RTA		87Y	F	xxxx-9761	71232		Delhi Hospital
JACOBS	RTA		87Y	F	xxxx-9761	71232		LSU Shreveport
JA	R		36Y	F	xxxx-3471	71052		LSU Shreveport
JA	R			F				LSU Shreveport

Source: IBM, 2010

After selecting the correct patient, clinicians can review the patient's medical history using the Carefx Fusionfx clinical portal — which includes, among other important information, medication history, allergies, lab results, and other reports — before prescribing new medications (see Figure 4). LARHIX estimates that the rate of detected medication errors has dropped by 80–90%.

FIGURE 4

Patient Reports from All Systems — Carefx Fusionfx Clinical Portal



Source: Carefx Corporation, 2010

Cost Savings for Patients and Healthcare Providers

LARHIX estimates that patients save between \$250 and \$450 per visit by avoiding travel expense and lost wages. Reducing the need to travel long distances also saves the state of Louisiana money because Medicaid reimburses patients for travel expenses. In addition, reducing duplicate testing saves payers, patients, and (when the patient is uninsured/underinsured) providers money. Medicaid and Medicare savings also benefit the public whose taxes help fund these programs.

The implementation of EMRs and PACS is also a source of cost savings for the rural hospitals. For example, Bunkie General Hospital, a 25-bed hospital in Bunkie, Louisiana, estimates that it has saved almost \$12,000 per month after implementing the PACS by eliminating the need to print

film, envelopes, and stickers for the images and send the images via courier or overnight delivery services to specialists. Physicians can pull up the diagnostic quality images directly using Carefx's Fusionfx clinical portal rather than wait for the images to be delivered or rely on patients to bring their images with them to the appointment. Portal access to patient health information not only saves physicians time but also reduces the chance that they repeat an order for lab tests or images because they cannot find the lab results or radiology reports or images.

Qualifying for ARRA Incentive Payments

Prior to the establishment of LARHIX, most of the RHC member hospitals had not implemented any form of HIS and would not have qualified for any stimulus funding under the American Recovery and Reinvestment Act (ARRA) of 2009. Deployment of EMRs and computerized physician order entry (CPOE), PACS, and HIE applications will help position the rural hospitals to demonstrate meaningful use of electronic health records and qualify for ARRA incentive payments. Those hospitals that have already implemented an EMR have reached HIMSS Level 6 or 7.

LESSONS LEARNED

LARHIX executives and clinician champions were asked about lessons learned and what they would do differently if they had to do it over again. Many of LARHIX's lessons learned were consistent with discussions IDC Health Insights has had with other HIE executives in the course of covering the HIE market, including the importance of engaging physicians, defining the value proposition for stakeholders, and promoting the project.

- **Engage physicians early in the project.** One of the biggest challenges to overcome was obtaining physician buy-in. Initially, physicians were wary of the new teleconsultation service because of their heavy patient loads and the perception by some physicians that it was "one more thing to do." LARHIX's Welch put it succinctly: "If the physicians aren't using it, then you've wasted a lot of time and money." LARHIX made a point of engaging the physicians early on in the process, asking for their input on the data they wanted to see and the look and feel of the portal's user interface and then working with the vendors to respond to their suggestions for improvements.
- **Demonstrate value.** It is important to establish metrics and track whether the organization has achieved them. Stakeholders will be more willing to participate and share health information if they see the value of the HIE. Additionally, stakeholders will ask for performance statistics, especially if they are providing funding.

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- **Promote the availability and benefits of the project.** Despite repeated notices announcing the availability of telemedicine services and the fact that the telemedicine equipment had been in the hospital for 18 months, many physicians were not aware that they could conduct teleconsultations with their rural patients. To increase awareness, Dr. Hines personally attended medical staff meetings and followed up with letters, which improved adoption.
- **Realize there is no one-size-fits-all solution.** This lesson learned applied to multiple aspects of the project, including EMR selection for the rural hospitals and the decision to implement a federated data model to mitigate data governance issues.
- **Perform a needs assessment.** The corollary to the preceding lesson learned is that not all hospitals are the same. The participating hospitals ranged from critical access hospitals to small to large hospitals, all with different ownership models. The rural hospitals' needs and objectives for information sharing and collaboration vary across the LARHIX network. Also, the ability to provide certain services (e.g., lab tests, imaging) varies widely among the hospitals and their patient populations. Training is essential to "get everyone on the same page."
- **Strive for critical mass.** Early adopters are important to any grassroots effort, but it is also important to establish a critical mass of participants, data sources, or transactions to be able to demonstrate the value of the HIE. Rolling out the HIE along referral networks or other relationships will help create that critical mass.
- **Work closely with users and vendors.** LARHIX provided end-user feedback for improvement to its vendor partners, which were very responsive to suggestions. Accommodating end-user requests (when appropriate) has been very helpful in obtaining end-user acceptance. "It's come a long way since we first started," noted Lisa Sirman, R.N., telemedicine coordinator for LSUHSC-S.

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FUTURE OUTLOOK

LARHIX is on track to continue deployment of EMRs to the remainder of the hospitals in northern and central Louisiana. As these hospitals come online with EMRs and other clinical information systems, they will be connected to the LARHIX exchange. Additional Carefx offerings, such as disease management dashboards and expanded clinical views, will be rolled out to the hospitals as they expand their electronic data capabilities and are able to take on more functionality. Ultimately, LARHIX would like to expand its services to rural hospitals in southern Louisiana.

Currently, LARHIX is the only operational, fully functional regional HIO (RHIO) in Louisiana. However, it is not the state-designated entity. In February 2009, the Louisiana Department of Health and Hospitals (DHH) named the Louisiana Health Care Quality Forum (LHCQF) as the state-designated entity to manage the planning and implementation of health information technology grants made available under ARRA. The state has been awarded \$10.6 million in grant funding over four years. LHCQF will leverage existing investments and efforts, such as LARHIX, to align with the state plan. In addition, statewide privacy policies will follow the model established by LARHIX, which will position LARHIX well for expedient future expansion across the state. (Reaching consensus on privacy and security policies is a common challenge for HIOs across the country. In some cases, HIOs can spend more time addressing this challenge with stakeholders than building out the technical infrastructure.)

In terms of long-range planning, LARHIX is evaluating a number of projects to expand its services. Examples include centralized continuity of care documents (CCDs) to help providers meet meaningful use requirements and for disaster recovery emergency response, disease state dashboards to help physicians manage the day-to-day care of their patients with chronic diseases, and business intelligence and analytics reporting to support population health management. Another idea LARHIX is exploring is accepting feeds from telemetry devices (e.g., heart monitors, oximeters) that would allow patients to recover at home with their friends, family, and local physician nearby and also enable remote monitoring by LSUHSC-S specialists. This idea is still in the early concept phase and several years away from actual implementation.

ESSENTIAL GUIDANCE

Actions to Consider

HIE initiatives need clearly defined business and clinical objectives beyond "being a RHIO for the sake of being a RHIO." Using the HIE platform should provide new capabilities within the workflow, not add extra steps that make it more difficult for the clinician user and thus thwart adoption. Lack of ongoing stakeholder involvement in the HIE effort is a common point of failure for many fledgling organizations. LARHIX followed an "inside out approach as opposed to an outside in approach" by working with noncompetitors, rolling out the network along natural referral patterns, and automating the processes that manage the flow of patients from care setting to care setting, especially from the rural hospitals to LSUHSC-S.

Many HIEs, especially those connecting rural provider organizations or organizations serving uninsured and underserved populations, experience significant budget constraints. Health information organizations must develop sustainable business models to support ongoing operations after initial grants and subsidies are exhausted. While RHC continues to seek funding from the state to expand its technical and service offerings, maintaining the current LARHIX project could be funded from cost savings realized from implementing just the PACS alone.

LARHIX's actionable advice to other health information organizations includes:

- **Work at the grassroots level to define the business case.** The benefits of access to health information need to be expressed in layman's terms to stakeholders and in terms of "what's in it for them."
- **Link objectives to measurable outcomes.** It is important to establish metrics and track whether the organization has achieved them. Stakeholders will be more willing to participate and share health information if they see the value of the HIE. Additionally, stakeholders will ask for performance statistics, especially if they are providing funding. LARHIX tracks statistics that quantify the benefits for all stakeholders — rural hospitals, LSUHSC-S, payers, and, especially, patients.
- **Recognize that one size does not fit all.** LARHIX recognized early on that a "one size fits all strategy" was not going to work. This is why it allowed the hospitals to select from a short list of EMR vendors or a vendor of their choice and pursued a federated data model that would support a governance strategy that works for all participants and did not require data standardization.

HIEs are steadily gaining traction as providers increase their investments in EMRs and CPOE, PACS, and other clinical information systems to qualify for ARRA incentive payments and avoid penalties starting in 2015. eHealth Initiative's 2010 *Annual Survey on Health Information Exchange* reports that 73 fully operational HIEs are transmitting data in 2010, up from 57 in 2009. Of the 73 operational HIEs, defined as achieving Stages 5–7 according to eHealth Initiative, 48 are not dependent upon federal funding and 18 are breaking even. Most common revenue models for the 18 achieving sustainability are subscription or transaction fees for data providers and users, with subscription fees (or membership dues) mentioned more often than transaction fees. HIEs should carefully evaluate different models for data, governance, and privacy and select the models that work best for their unique technical, business, and clinical needs.

PARTING THOUGHTS

Clinician collaboration using telemedicine services and health information exchange technologies is an exciting breakthrough for rural healthcare providers. LARHIX embodies "smarter healthcare." It is:

- **Instrumented.** The first step in this journey was to deploy healthcare information technology at 26 rural hospitals. As hospitals become more adept at using EMRs, PACS, and other clinical information systems, new opportunities to capture information, such as directly from bedside telemetry, will emerge.
- **Interconnected.** The sharing of health information and teleconsultations between rural physicians and LSUHSC-S specialists are two of LARHIX's core services. The benefits of an interconnected health system, especially in a rural region where access to care is a major impediment to better health, are significant. LARHIX has done an exceptional job quantifying and documenting the positive impact of HIE and teleconsultation services.
- **Intelligent.** The next step in LARHIX's journey is to leverage the digital patient information now available to the rural hospitals to create disease state dashboards, which will enable better population health management for the region.

The focus of LARHIX has always been on patient care and making better care available to patients who would not otherwise have access to care. "It's not an IT project, but a patient project," wisely noted LARHIX's Welch.

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ABOUT IDC HEALTH INSIGHTS

IDC Health Insights provides research-based advisory and consulting services that enable healthcare and life science executives to:

- Maximize the business value of their technology investments
- Minimize technology risk through accurate planning
- Benchmark themselves against industry peers
- Adopt industry best practices for business/technology alignment
- Make more informed technology decisions and drive technology-enabled business innovation

IDC Health Insights provides full coverage of the health industry value chain and closely follows the payer, provider, and life science segments. Its particular focus is on developing and employing strategies that leverage IT investments to maximize organizational

performance. Staffed by senior analysts with significant technology experience in the healthcare industry, IDC Health Insights provides a portfolio of offerings that are relevant to both IT and business needs.

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