

Overlay Regional Health Information Exchange (HIE) Systems:

The Sustainable Business Model for Health Care Information Technology in the United States

"The most remarkable feature of this 21st century medicine is that we hold it together with 19th century paperwork."

– Tommy G. Thompson
Former Secretary
U.S. Department of Health and Human Services

Health Care Information Technology Overlay Systems Meet Today's Challenges

Health care in the United States faces a number of challenges: systemic inefficiencies, rising costs, universal delivery, a need to refocus on quality instead of quantity, and ever more complex legislation and government regulation.

Collaborative care models have been proposed as one potential solution. These new models, known alternately as Connected Healthcare Communities (CHCs), Regional Health Information Organizations (RHIOs), Regional Health Information Exchanges (RHIEs), and Regional Healthcare Information Networks (RHINs), integrates data from hundreds of different sources, to create a complete electronic health record of patient care.

In building these collaborative care models, HIT overlay solutions have been shown to be particularly cost-effective, because existing systems can be leveraged. HIT overlay systems use what's working and in place now, which also reduces the need for staff training and leads to quicker acceptance by users. Rural Health IT Corporation gives a real world case study of an HIT overlay system on page 18.

Collaborative care offers significant benefits to all stakeholders in the health care system including patients, hospitals, payers, employers, and government agencies.

The move toward collaborative care has been fostered by recent government initiatives and large-scale private sector programs that encourage providers to adopt new technologies central to this model. This includes the recent new transparency initiatives and the Anti-Stark Safe Harbor Regulations from U.S. Department of Health and Human Services Secretary Michael L. Leavitt.

In this document we will provide an understanding of both the industry's needs and an outline of the technology infrastructure required to execute overlay system collaborative care models.

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Executive Summary: HIE Overlay Systems

The U.S. health care system is currently operating in the Dark Ages when it comes to the capture, storage, segregation, organization, retrieval, presentation and aggregation of critically important health care information. At all levels of the health care chain, most information is still captured with paper-based or elemental, legacy-computer information systems. The problem begins with providers and extends through pharmacies, insurance companies and related payers, clinics, laboratories, hospitals and other critical systems essential to providing immediate, usable health care data. These problems are further compounded by the fact that most of these systems cannot talk with one another. They are usually not interoperable, either technically or semantically.

However, according to the National Coalition on Health Care, these problems can be solved. We can show conclusively that the proper use of Overlay Regional Health Information Exchanges **can reduce national health care costs by up to 40 percent**, savings that, nationally, could reduce the cost of health care by a **half trillion dollars** not to mention the improvements to quality healthcare delivery.

This will be done in a number of ways:

1. **Providing** performance and quality data in a timely fashion, so that health care organizations can better assess and improve their own performance – This means the health care industry as a whole will become more transparent, allowing consumers to select the highest quality providers.
2. **Enabling** clinicians to collaborate to deliver higher quality care, while reducing redundant tests and other procedures
3. **Helping** clinicians to deliver more personalized care, based on each patient's particularized condition and medical history
4. **Setting** a foundation of clinical best-practices, so that care is more consistent from one institution to another and from one region of the country to another
5. **Helping** to prevent medication errors and other types of medical errors which now result in over 100,000 deaths per year¹
6. **Developing** solutions that reward quality initiatives and pay-for-performance programs encouraged by the federal Centers for Medicare and Medicaid Services and other payers
7. **Developing** interoperable products that overlay and leverage legacy HIT systems resulting in a cost effective solution.

Dr. Julie McGowan, Professor at the Indiana University School of Medicine and Site Director of the Federal Agency for Healthcare Research & Quality's National Resource Center has referred to this interoperable technology as "a promising new paradigm shift in healthcare that can be a national model."

¹ Leapfrog Group

The Case for Overlay Regional Health Information Exchange Systems

- Cost savings – leveraging existing systems & reduced training
- User acceptance –less new systems to learn
- Improved efficiency and transparency in health care delivery
- Improved quality of care
- Improved patient safety
- Accountability - facilitating improved reporting of outcomes
- Improved clinical decision support
- Electronic communication between patients and providers
- On-line health care information sources for patients
- Anywhere, any time provider access to medical records and information
- Portability to numerous common devices and interfaces
- Reduction in overall costs, by eliminating the need for couriers, faxes and other methods of transfer of paper records
- Enhanced collaboration with health care organizations, government agencies, payers and other third parties
- Medication tracking and electronic ordering, to address medication errors and adverse drug reactions
- Reduced information-related errors in treatment and overall care
- Creation of a framework to allow for the installation of future technologies and addendums to Electronic Health Records
- Creation of a system which can be scaled up and duplicated repeatedly in other places, so that other partners may be added
- HIPAA compliance and dependable security of patient records
- Creation of a stringent, dependable back-up, disaster-recovery system
- Improved rates of clinician adoption, because clinicians can go to a single place to get all relevant information on a patient, rather than having to open multiple applications
- Time savings for clinicians
- Clinicians will be able to view, update and add new data to multiple systems and applications from within a single interface.
- A comprehensive view of patient status and medical history can be gained from within one window, allowing for improved and more timely clinical decisions.

The sustainable business model for Overlay Regional Health Information Exchanges (HIEs)

The focus is on cost-effective solutions, where savings and revenue from a new HIE leads to a return on investment of five years or less. This will be done by purchasing cost effective overlay HIT systems which can be leveraged regionally and by creating pay-for-performance initiatives and transparency protocols, to both save and make money. In addition, a functioning HIE system allows for the running of potentially lucrative clinical drug trials. Also, the HIE's ability to capture de-identified data will create a valuable resource available for analysis, comparison, use and sale by HIE owners.

While these things are valuable and important, they don't take into account the important indirect benefits that come from an HIE's real-time linkage between and among institutions and the people all along the health care chain. This includes people at any of the HIE's physical locations, such as primary care physicians, specialists, x-ray, laboratories, pharmacies, records departments, billing and finance offices, third-party payers, government agencies and anyone else important to the process. Little or no new hardware needs to be bought to do this.

An HIE will enable the creation of improved quality-of-care, better outcomes for patients, increased efficiency and a more profitable health care business operation.

Consider this real-world example of a Rural Health IT Corporation Overlay Regional Health Information Exchange operating now. The case study is on page 18:

- Cost-effective Regional Health Information Exchange – cost \$2 million
- Annual administrative savings, with three provider sites – \$150,000 per year
- Leverage with physicians – 15 physicians times \$100 per month, equals \$18,000 per year in new revenue
- Consider de-identified aggregated data capture for payers – \$50,000 per year in new revenue from its sale
- Develop quality and transparency initiatives, through comparison and evaluation of services
- Develop pay-for-performance initiatives with payers – \$50,000 per year in pay-for-performance awards
- Clinical drug trials and protocols – \$100,000 per year in new revenue
- Transparency protocols – \$50,000 a year in quality-driven new revenue
- No new employees needed to manage the new HIE
- Little or no new hardware to purchase – no staff training on new systems

This adds up to \$418,000 a year in estimated savings and new revenue, for a return on investment in less than five years.

How to save money and improve health care with Overlay Regional Health Information Exchange (HIE) Systems

Lives Lost and Injuries Sustained – Costs Increased Under Current Systems

According to the Leapfrog Group, nationwide, **hundreds of thousands** of lives are lost and **millions of injuries** occur annually from simple mistakes made under the present system, creating **billions** of dollars of unnecessary costs. The cost of providing health care services has increased dramatically, partly because of the system's inability to provide needed data instantaneously and selectively to those who need it most. Federal government initiatives, such as HIPAA and increased surveillance required by the Homeland Security Department, further add to the problem.

Clinical Trials Delayed

According to Scott Gottlieb, M.D., FDA Deputy Commissioner for Medical and Scientific Affairs², clinical drug trials, which are so important to bringing valuable new drugs to market in a timely fashion, are delayed significantly because of the difficulty of identifying and selecting ideal participants, in order to complete the trial process. Having the proper data available when needed would solve this. This is the challenge facing pharmaceutical companies, to recoup literally millions of dollars in lost revenue. HIEs can help to do this.

Quality of Care, Not Just Quantity

Currently, the claims-based health care payment system rewards multiple methods of care, testing and medications. Furthermore, it has not adequately accounted for the costs associated with upcoding. This encourages increased quantity of care, instead of **improved quality of care**. It also increases costs. This system has to change, to emphasize and reward improved quality of health care delivery. The changes start with the modernization of Health Information Technology and creation of a national system of usable health care records.

Key Needed Ingredient – Information Technology Solutions:

The solution is not mysterious. Michael Leavitt, U.S. Secretary of Health and Human Services, recently stated³ that the establishment of national electronic health care information systems is the **one essential ingredient** needed to reshape the inadequate U.S. healthcare model. Without this, Leavitt believes **nothing else of significance** is likely to happen in the area of serious health care reform.

² Speech on May 18th before the 2006 Clinical Research Educational Conference, Northwestern University Medical Center, Chicago, Illinois

³ Speech in Boston, Mass., August 2006

Marshalling resources and building successful Overlay Regional Health Information Exchanges (HIEs)

The Challenge: Health Care Today in the United States

Our nation's health care system is in crisis. According to the Institute of Medicine's Health Care Quality Initiative, each year, as many as 98,000 deaths are caused by avoidable medical errors. In 2003 alone, approximately \$510 million was spent on ineffective care. At the same time, costs continue to rise. The National Coalition on Health Care noted that in 2003 and 2004 the average insurance premium rose 13.9 percent and 11.2 percent, respectively. Demographic trends forecast even more problems as the U.S. population lives longer, with chronic diseases becoming more and more common.

Clearly, something has to change.

At the root of the problems facing the U.S. health care system is a lack of coordinated care. As more and more people live for extended periods of time with one or more chronic diseases, a coordinated care model becomes increasingly important. Seventy-five percent of all of the nation's health care spending is spent on people who have one or more chronic diseases.⁴ These patients see an average of 4.6 physicians each year. If the patient population that drives three quarters of the nation's cost is seeing several care providers annually, then a collaborative model becomes imperative. Without it, medical errors, duplicate testing and therapies and overall costs will continue to increase, while quality of care will be driven down.

Our current system keeps medical information in separate, so-called "information silo" systems. Every silo system has its own components and architecture, which needs to be replaced periodically. There is only minimal coordination of care. This adds significant economic and quality-of-care costs throughout the system. Regional Health Information Exchange technology offers a solution to this increasing health care crisis, by dramatically increasing the ability to coordinate care, by using shared medical records.

Until recently, the health care industry has invested significantly less in Information Technology than has other industries. However, a recent report from the National Institute of Health Policy recommended that hospitals and health system administrators reverse this trend and urged them to "implement information and communications technology, to ensure consistent and real-time

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National Coalition on Health Care

sharing of medical information among providers and delivery organizations to reduce duplication of service and create a seamless system of care.”

Regional Health Information Exchanges can dramatically increase an organization’s ability to coordinate care and to improve the quality of that care, by the use of shared medical records.

The Solution: Connected Healthcare Communities

The good news is that the health care industry has heard the wake-up call.

According to a study published in November of 2004 by the federal Office of the National Coordinator for Health Information Technology, the White House recently called for development of an interoperable, national electronic health record (EHR) system within the next decade. This has resulted in increased governmental and community focus on the industry – along with significantly increased government funding.

In response, regional health care consortia and large health care delivery systems have begun to plan for and invest aggressively in products and solutions to help to reduce costs and, more importantly, increase the quality of care across regional markets.

This increased emphasis on collaboration and sharing of medical information points toward the establishment of Regional Health Information Exchanges. For example, consider initiatives such the Mt Ascutney Healthcare Consortium Overlay HIE, shown as a case study on page 18 of this white paper.

As quoted in the Keene, New Hampshire *Sentinel*, on Oct. 25, 2005, U.S. Senator John Sununu (R-NH) said Rural Health IT Corporation “is leading the way in developing solutions for interoperability...” and “is utilizing this technology to create a truly connected healthcare community.”

In addition to funding from state and national governments, private industry is also hearing the call. From the private sector, several payers and employers have indicated a willingness to help fund Health Care Information Technology initiatives. For example, WellPoint, the nation’s second-largest health care insurer, recently announced a \$440 million package to help performance-based programs. These include “Bridges to Excellence,” an employer coalition which includes General Electric and the Ford Motor Company, that is paying eligible doctors on a per-patient basis to implement technology that improves patient care.

A Technology Model for Collaborative Health Care

Regional Health Information Exchanges offer a tested, proven and economical solution to this crisis, with information architecture that allows disparate

Information Technology systems to overlay and share information across an organization's legacy systems, or even throughout an entire health care system.⁵

Patient data, such as lab results, consultation reports, medication records and complete medical histories can be stored in electronic records that can be securely accessed and shared by physicians and authorized staff at any point of care.

As we noted earlier, HIT overlay systems have been shown to be particularly cost-effective, because little or no new systems need to be purchased and deployed. Rural Health IT Corporation's HIT overlay systems use what's working and in place now, which also reduces the need for staff training and leads to quicker acceptance by users.

In Rural Health IT Corporation's HIE overlay system, information stays where it is now, transferred as needed through a Clinical Information Portal (CIP) to authorized providers and others along the system, wherever they may be. This is done securely, in real time. The systems in use at particular institutions will stay in use, with little or no disruption to current staff procedures.

By replacing antiquated paper files with an electronic information hub that brings together literally hundreds of independent Information Technology systems for a complete view of a patient's health, health care communities around the country are controlling costs, increasing efficiency and, most importantly, improving the quality of patient care.

This new model for collaborative health care will bring significant benefits to all of the stakeholders in health care delivery, including patients, providers, third-party payers, employers and government agencies.

The Overlay Regional Health Information Exchange model is centered on an information architecture that enables an electronic record of patient data to be shared through the use of the Clinical Information Portal. Patient records can then be shared or accessed from any authorized point in the health care enterprise, including laboratories, physicians' offices, pharmacies, records departments, hospitals, billing departments and third-party payers, among others.

These electronic patient records will replace paper charts. It's well known that paper records can be incomplete or be lost. Further, Overlay Regional Health Information Exchanges eliminate the problem of incompatible information systems, because of the implementation of an interoperability platform that

⁵ Testimony on Health Information Technology by Phillip T. (Terry) Ragon CEO and Founder, InterSystems Corporation, before the U. S. Senate Committee on Commerce, Science, and Transportation's Subcommittee on Technology, Innovation, and Competitiveness, June 21, 2006

ensures that all of a patient's data, no matter its sources, is integrated into that patient's record.

Overlay HIEs also allow health care systems to implement a number of solutions that can greatly impact the efficiency and quality of patient care, including, among others, electronic prescribing, mobile inpatient rounding and physician portals that enable anywhere, any time access to patient information.

However, as we noted above, the Overlay Regional Health Information Exchange model is about more than convenience. Enabling a complete and up-to-the-minute view of patient data also brings tangible benefits to the entire system. Among a number of benefits, most significant are improvements in patient safety, through the reduction of medical errors and the reduction of overall costs through the elimination of redundant tests and procedures.

Why Now: The Benefits of Connected Healthcare Communities

Using an Overlay Regional Health Information Exchange model to foster collaborative care is cost effective and it dramatically improves the quality of care, through the reduction of preventable medical errors. In this model, all stakeholders, including patients, payers, employers, health care providers and governments benefit.

Patients and Health Care Providers:

Patients and health care providers usually see the most immediate and dramatic benefits from an HIE initiative. Sharing of clinical information between health care providers greatly improves medical decision-making and increases patient safety, by reducing the risk of medical errors. Patients further benefit from the privacy protections resulting from a governance model that includes highly respected patient advocates, ensuring that all medical data is private and secure.

Also, studies have found that patients who have a strong patient-physician relationship which revolves around the productive and efficient exchange of information are more likely to see themselves as "living well" with their chronic condition.⁶

Payers and Employers:

The business community, as a primary payer for health care, has long recognized the serious problems plaguing the nation's health care system. These problems manifest themselves in a variety of ways. The most obvious is the

⁶ *Defining the Patient-Physician Relationship for the 21st Century, 3rd Annual Disease Management Outcomes Summit, October 30 – November 2, 2003, Phoenix, Arizona*

dramatic and continuing rise in the cost of health insurance, for which employers bear a sizeable burden, thus the need for better quality of care. Regional Health Information Exchanges will lead to higher quality of care, more effective treatment and the reduced costs afforded by elimination of redundant diagnostic tests, and a reduction in provider administrative costs. This will ultimately result in lower health insurance premiums.

Equally burdensome is the loss in productivity experienced by businesses whose employees experience medical errors or undergo unnecessary, repetitive diagnostic tests. Through the use of Regional Health Information Exchanges, medical errors will be reduced and the costs of providing health care in those areas where HIEs are in place will decrease. Further, as the quality, cost and safety of the health care system improves, the overall quality of life for residents in those areas will improve, making it easier for employers to attract qualified employees.

Governments:

Governments and the taxpayers they serve are the largest payers for health care. Rapidly rising government health care costs negatively impact program funding for Head Start and WIC, as well as services such as subsidized immunizations, emergency medical care, community health clinics, community health plans, poison centers, and health care for state employees and prisoners in state institutions.

Increasingly aware of the patient safety and quality-of-care issues in today's health care systems, states are searching for ways to positively impact health care within their borders. The use of Regional Health Information Exchanges will decrease costs, increase efficiency and improve the quality of care. This will be a winning combination for governments nationwide.

Technical Considerations:

From a technical perspective, an Overlay Regional Health Information Exchange should focus primarily on the sharing of clinical information, while recognizing the potential for such a system to eventually develop useful administrative and public health functions. To that end, the HIE system must:

1. Permit interconnectivity to all of a community's health care delivery systems and provider sites
2. Provide access to data that is clinically relevant
3. Provide point-of-service access and timely response
4. Be compatible with both existing and planned information systems
5. Be consistent with national Information Technology direction and initiatives

6. Be based upon and adhere to national and state data-element and coding-transaction standards
7. Follow existing and developing industry, national and state interconnectivity standards
8. Comply with all required privacy and security standards
9. Guarantee accuracy, validity and timeliness of data across all participating sites

The Interoperability Imperative:

The interoperability platform forms the foundation of the Regional Health Information Exchange, enabling the creation of interconnected, electronic health records of both inpatient and ambulatory data from multiple source systems across a particular enterprise.

This interoperability platform must include:

1. Standards-based open architecture that interfaces with all existing systems and databases
2. Roles-, rules- and relationship-based security systems, to protect patient data
3. HIPAA-compliant security architecture

In addition, the interoperability platform should meet standards for authentication and encryption and be designed to accept additional data elements and structures, such as the Continuity of Care Record (CCR) data set, HL-7 and NCPDP prescription drug transactions, as they are developed.

Application Service Providers (ASP) Advantage:

HIEs are compatible with Web-based ASP models. This enables health care organizations to access powerful solutions, while minimizing the overall costs involved in purchasing, implementing and maintaining the technology.

Under the ASP delivery model, organizations are charged on a per-user basis for each module used, eliminating capital start-up costs. There is no costly equipment to purchase or maintain, other than PC workstations, printers and PDA devices. The ASP model also allows for a speedier implementation than other systems, reducing the amount of time needed for equipment installation or facility reconfiguration. In addition, organizations are able to manage redundancy, backup and failure in a scalable manner.

How to build them: Overlay Regional Health Information Exchanges (HIE)

Overlay Regional Health Information Exchanges are based around a central information hub that integrates data from hundreds of different sources, to create complete electronic health records of patient care.

Developing an Overlay Regional Health Information Exchange requires extensive planning that takes into account the varied stakeholder needs in a health care system. The four phases outlined in this document presents an efficient and strategic approach to developing the HIE, from initial assessment through training and deployment.

The four phases are as follows:

Phase One: Plan the Regional Health Information Exchange

Phase Two: Build the e-Health Infrastructure

Phase Three: Connecting Physicians, Hospitals, Patients, and Consumers

Phase Four: Evolve the Network

Phase One: Plan the Regional Health Information Exchange

In the first phase of development, the goals are to help the HIE members to define their strategic goals and to identify all of the stakeholders involved. To be successful, it is critical to define the benefits to be expected for all stakeholders and to get their support for the HIE model being proposed. This phase includes key project tasks, such as an HIE readiness assessment, strategic business planning, the clear division of responsibilities among the HIE's members, deciding how the system will be managed and governed, deciding how everything will be paid for and the development of the technology strategy to be used.

The Readiness Assessment:

Members must first evaluate the proposed strategic plan against best practices in use at other Regional Health Information Exchanges. Decide the strategies, goals, and the next steps to be taken. Prepare an opportunity analysis, list of funding resources,

requirements gathering and analysis. This should include substantial clinician involvement, and a high-level cost estimate.

The Strategic Business Plan:

Create a detailed business plan for implementation, which includes specific areas such as finance, compensation, technology and clinical planning.

Governing Structure:

Review various governing options and establish organizational objectives and principles, including choice of entity, membership, governing body, officers and stakeholder roles.

Funding:

Define and develop a funding model, which would include project funding, executed-participation agreements, articles of incorporation and bylaws as a new, fully incorporated not-for-profit entity.

Technology Planning and Strategy:

Develop the information infrastructure, which includes Health Care Information Technology systems, process improvement mechanisms, connectivity, databases and resource requirements.

Phase Two: Build the e-Health Infrastructure

In this phase, members of the Overlay Regional Health Information Exchange will define the technology strategy that will help them to successfully achieve their goals. Emphasis will be placed on the creation of both long-term and short-term goals. During this phase, the organization will develop the technical infrastructure that will enable information sharing across the community.

Technology Readiness Assessment:

Determine technology needs to meet short and long-term initiatives. Estimate infrastructure costs. This process includes both examining current core systems and data services and identifying opportunities to leverage both legacy systems and current Information Technology projects.

Technology Strategy:

Define short-term and long-term goals to insure that the proposed information architecture is designed to take the Overlay Regional Health Information Exchange

out for several years. Define how you will connect to various stakeholders, to deliver a sustainable project.

Information Architecture:

Implement an interoperability platform that enables the organization to:

1. Transmit, collect, transform and store data
2. Connect all stakeholders in the health care-delivery process
3. Create secure, interconnected, electronic health records of both inpatient and ambulatory data
4. Deliver data to clinicians through Web-based, desktop and mobile applications
5. Enable private and secure exchange of data
6. Provide a patient-centered longitudinal data repository of normalized data from multiple source systems
7. Leverage provider's existing legacy software and/or any new software applications the provider was planning to buy

Phase Three: Connecting Physicians, Hospitals, Patients, and Consumers

From the overall technology strategy you have already defined short-term and long-term goals. In the third phase, you will define the specific applications that will deliver the highest value in the shortest period of time.

Connect Patients and Consumers:

Select content and applications to help consumers and patients manage their health, including medically reviewed consumer health content, health risk assessments, health trackers and personal health diaries.

Connecting Physicians:

Implement solutions that enable anywhere, any time physician access to patient information, such as e-prescribing, ambulatory Electronic Medical Records, practice-management tools and physician portals.

Connecting Hospitals, Laboratories and other Data Repositories:

Utilize applications that facilitate authorized access to the full range of patient data, including, but not limited to: laboratory results, transcribed reports and admitting and discharge information, among others.

Phase Four: Evolve the Network

The fourth phase in the process are the ongoing refinements and adjustments that ensure maximum value from solutions implemented thus far. Activities include integration, deployment, training of users across the network and roll-out and configuration for individual medical practices.

Management of Data-Trading Partners:

Work with all data-trading partners, including laboratories, hospitals, and physician groups, both to ensure data quality and integrity and to continue to improve.

Management of the Data Libraries:

Manage all connected data libraries and codification libraries, to ensure compliance from all sources. Regularly add new information to the master codification libraries. Map the information from each of the data sources. Manage the master patient index queues to insure proper patient matching from all data sources.

Integration:

Complete additional integration projects as new stakeholders or data-trading partners are brought online. **Manage the change process.**

Deployment and Training:

Work with individual physicians' practices to provide training and configuration changes. Make sure the solutions properly fit into their workflow. **Manage the change process.**

Data Analysis:

This includes management of reports for various stakeholder groups, including pay-for-performance reporting, aggregate organizational-level reporting, usage-reporting, drug safety analysis, disease management programs, efficiency analysis, identification of clinical trial efficiencies and practice-level reporting.

Measurements of Quality Improvements:

In order to achieve the Data Analysis mentioned above, comprehensive measuring systems will be developed, to track quality improvements achieved by an HIE. In order to for an HIE's members and owners to receive the most benefit possible, both initially and in the future, evaluation plans and comprehensive, ongoing analysis are a critical part of an HIE's design and process. This will be done by creating evaluation plans to make comparisons and to set required

baselines, benchmarks, metrics and survey elements. In addition, ongoing analysis protocols will be built into each HIE, to obtain individual, public health and business benefits from the results of these measurements. This would include pay-for-performance, patient-outcome, quality-of-care, drug safety, clinical trial, disease management and transparency initiatives, among others. Furthermore, HIE members will also be able to create measurement protocols of their own, to track data important to them. As an HIE evolves, measuring systems can be changed to suit current needs.

Case Study: The Mt. Ascutney Healthcare Consortium

Rural Health IT Corporation, has assisted the Mt. Ascutney Healthcare Consortium, headquartered in Windsor, Vermont, with Consortium members in both Vermont and New Hampshire, to establish the nation's first multi-state Overlay Regional Healthcare Information Technology system at its two member hospitals and a private medical radiology practice.

With help from a grant from the federal Agency for Healthcare Research and Quality, the Consortium has identified and built a proven Overlay Regional Health Information Exchange system.

This new system overlays on to the hardware and software already working and in place, to allow each of its members' current Information Technology applications to communicate seamlessly, on the basis of an HL-7 stream.

The three partners developed a standardized means to achieve interoperability between disparate information systems that were not originally intrinsically compatible. Before the creation of the HIE, information could not be shared, updated nor synchronized among the various Healthcare Information Technology systems then in use by the Consortium's three partners, because of what had been the closed, proprietary nature of each of their database's architectures.

This integrated the members' existing incumbent, stand-alone, so-called "silo" databases and information systems, to share patient information effectively. This has created a seamless, comprehensive Regional Health Information Exchange.

For example, the specific tasks accomplished include:

- The development of the ability to access and transmit radiology study files and patients' health care, demographic and other billing information, among and between Consortium partners and remote sites (i.e., doctor's offices, their billing office, other institutions, etc.) in real time, with facility and appropriate security;

- The development of the ability to more fully integrate the members' existing, separate Clinical Information Systems and Electronic Health Record Systems, including allowing remote access to electronic patient data, again, in real time, with facility and appropriate security

For the future, the Consortium's system is scalable and is able to be duplicated elsewhere, using the same standards. They will soon offer this solution to other institutions in the area, in order to allow broader sharing of relevant information.

Conclusion:

Annual health care spending in the United States hit \$1.9 trillion in 2004. That number is expected to rise to \$2.9 trillion by 2008, according to the Centers for Medicare & Medicaid Services. But less than five percent of that amount was spent on Health Information Technology – far short of what's found in financial institutions and most other service-oriented industries.

As we noted above, use of Overlay Regional Health Information Exchanges can **reduce national health care costs by up to 40 percent**, savings that, nationally, could reduce the cost of health care by a half trillion dollars. All the while, it was been further proven that quality of care can be improved as well.

The most effective Health Information Technology investments will build on a collaborative care model that includes an interoperability platform able to connect disparate systems. A successful collaborative care model must connect all stakeholders, including, but not limited to, hospitals, laboratories, pharmacies and ancillary services, physicians across the care continuum, payers, consumers and patients. It must recognize and leverage all appropriate existing technology infrastructures in the marketplace and be designed for expansion in the future.

The Regional Health Information Exchange model offers significant short- and long-term benefits for the community, as it addresses the needs of everyone, particularly the chronically ill patients who use the majority of health care services in the United States.

Consider again this real-world example of a Rural Health IT Corporation Overlay Regional Health Information Exchange operating now. The case study is on page 18:

- Cost-effective Regional Health Information Exchange – cost \$2 million
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This adds up to \$418,000 a year in estimated savings and new revenue, for a return on investment in less than five years.

This white paper was written as an overview of the advantages of Overlay Regional Health Information Exchanges (RHIEs). Rural Health IT Corporation can supply full documentation, references, evaluations and metrics, specific business and quality models, and additional analysis, if requested. Please contact us for more information.

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