

APPENDIX E:

**SITE VISIT REPORT--
INDIANA HEALTH INFORMATION
EXCHANGE,
INDIANAPOLIS, INDIANA
SEPTEMBER 13-15, 2006**

Health Settings visited: Indiana Health Exchange (IHIE), Regenstrief Institute, Indiana University (IU) School of Medicine, Wishard Health Services, Lockefield Village Rehabilitation and Healthcare Center, the Visiting Nurse Service (VNS) of Central Indiana, Kindred Long-Term Acute Care Hospital, Beverly Enterprises at Brookview, and Briarwood Rehabilitation.

I. OVERVIEW OF THE LOCATION/CITY AND VISITED HEALTH SETTINGS

Indiana Health Information Exchange/Regenstrief/Indiana University School of Medicine. Indianapolis, Indiana has several major hospital systems including the Indiana University hospitals, St. Vincent, St. Francis, Community Health, and Westview. The five Indiana University hospitals are Wishard Hospital (part of Wishard Health Services, the county-managed system that serves vulnerable populations of Marion County, Indiana), the Roudebush VA Medical Center, Riley Children's Hospital, Methodist Hospital, and the Indiana University Hospital. The latter three are owned by Clarian Health Partners.

Our primary host for the site visit was Dr. Michael Weiner, MD, MPH, Associate Professor of Medicine, IU School of Medicine, Scientist at Regenstrief Institute, and Center Scientist at the IU Center for Aging Research. Many of the other individuals we spoke with the first day are dually appointed as faculty at the University as well as research scientists at the Center for Aging Research or Regenstrief Institute.

Dr. Weiner is leading a new program at Indiana University called Gero-Informatics (defined as the application of medical informatics to geriatrics care). The mission of this program is to advance research, clinical care, and education related to gero-informatics.

Under the leadership of Clement McDonald, MD, Indiana University deployed an early (1973) electronic medical record system (the Regenstrief Medical Record System), evolutionary descendants of which are still in use today. Again with leadership from Dr. McDonald and with assistance from J. Marc Overhage, MD, PhD, success with the medical record system led to the formation of the Indianapolis Network for Patient Care (INPC), which permits emergency department (ED) physicians at all major Indianapolis hospitals to retrieve patient information stored at one of the other hospitals. A simple example of the utility of this arrangement was a recent patient being seen in an Indianapolis hospital ED for "chest pain." Because the ED physicians could retrieve patient history information and see that the patient recently had a cardiovascular workup at a regional hospital a few months before, as well as read the results that showed the workup had at that time ruled out cardiovascular disease, they were able to diagnose a pulmonary embolism more quickly and at less cost and risk to the patient. While there are many factors that led to the current success of the INPC, regional ED physicians were the primary drivers and early users of this health information exchange and are credited with both pushing the concept of health information exchange within the

Indianapolis community of health care settings and with being the early adopters who participated in its development.

Steven R. Counsell, MD, Director of IU Geriatrics, described current plans to build on the elements of regional "informational continuity of care" achieved to date; specifically, his goal is to build and maintain an increasingly complete, up-to-date, longitudinal patient-centric record. An early sub-goal is to exchange data with local primary care physicians, pharmacies, and laboratories. Dr. Counsell and his colleagues are positioned to formulate and pursue these ambitious goals because of the decades of effort in collaborative processes and infrastructure invested by Drs. Clement McDonald, Marc Overhage, and regional co-workers, and also by early adopters and users. Development of the INPC has demonstrated to the regional health care community that an incremental approach to a patient-centric record is both possible and the best way to proceed.

Because of these and other past successes, the physicians presently leading the Indiana Health Information Exchange are overwhelmed with opportunity relative to other regional care sites; their challenge and opportunity--per Dr. McDonald's legacy¹--is to identify real, solvable health information technology (HIT) problems, and then solve them. An example of the application of this method is Regenstrief's early focus on the processing of laboratory test results. Their development paradigm enables them not to worry about the big picture, nor about painting themselves into a corner--as, for instance, they have done by continuing to use an unsupported version of the Microsoft OS for some of their order entry interfaces. (For skilled users, however, these interfaces are very high function--making use of fast keystroke-based commands.) Instead, they can invest their finite resources working on what they perceive to be the next most useful system function, learn from that effort, and go on to the next problem that is both important and solvable.

Part of Regenstrief's repertoire of "lessons learned" is that they have sufficient accumulated experience processing data feeds, such as laboratory data, from other hospitals that they prefer to take the remote data "as is" and deal with things like undetected duplicate patient records later. This is a tradeoff that few others are in a position to make. Because of their hard-won experience and their associated investment in tool development, they have "lowered the bar" for the next hospital, medical practice, or other source of encounter data to join the Network. That is, they take the data stream from whatever system the next care setting has in place and then they develop the software transformations and mappings required to integrate that data into the IHIE. Again, they can do this easily and productively because of the economies of scale resulting from decades of experience and tool investment. The alternative--requiring that each hospital or other care setting develop its own transformations and mappings into some abstract data model--is so expensive and fraught with delays and risk that few regions have succeeded in achieving clinical data exchange using this approach. An important, but little appreciated feature of the IHIE approach, is that the

¹ Dr. McDonald has just recently been named the Director of the Lister Hill Center at the National Library of Medicine.

integration team is focused only on the “next” data stream; it is not burdened, yet, with the necessity of solving the problem for rest of the region, the state of Indiana, the Midwest, or the nation. By focusing on the next data stream, they do not take on problems that are too large, and they can benefit--learn--from each step completed. Another little appreciated feature of the IHIE paradigm is that collaborative organizational energies can be focused on data issues--sharing, re-use, security, and the like--and not on technical details, which participants typically defer to the McDonald-Overhage Regenstrief leadership.

The deliberate focus on data as opposed to software has led Regenstrief to invest in the representation of transferred text-based information using formatted ASCII and to avoid using scanned images or unformatted text, wherever possible. This means that laboratory test result names can make use of the LOINC standard and, potentially, lab test results from different sites can be compared and aggregated.² It also means that the IHIE may someday be able to “interoperate by meaning” using medication and problem list data. That is, patients may one day have a unified medication list. For instance, the daily dose of acetaminophen in combination drugs can be computed with a resulting unified problem list, showing both chronic and acute diagnoses. Thus, even if the goal and benefit today is uniform human readability of exchanged clinical data, IHIE is in a position to explore use of other computer-empowering terminology standards such as RxNorm (medications) and SNOMED (problem list) in the future.

IHIE is in the early stages of implementing a portal called Docs4Docs³ that provides access across care providers to admission and discharge transcriptions, laboratories, radiology, EKGs, and pathology. At present, medications are not included. Physicians see Docs4Docs as a "glorified mail service," giving them web-based (anywhere, anytime) access to health care transaction reports. It is supported by the large hospitals in the Indianapolis metro area. There are a few places currently using this technology, including Kindred Long-Term Acute Care (LTAC) Hospital.

The Docs4Docs portal is very new, and potentially revolutionary. Those in charge do not feel pressure yet to open it up to patients, as Kaiser Permanente health care has accomplished, but they will feel this pressure soon. Right now, Docs4Docs is, as the name suggests, very physician centric. The portal leverages the experience and good will that has been generated by long-standing regional ED physician collaboration and interoperation among the five hospitals currently participating in the Network portal. One novel aspect of the portal is that physicians manage--create and maintain--their own patient links. This approach overcomes the challenges of physicians having multiple affiliations (and thus multiple identifiers) and it allows physicians to track down encounter records for the same patient that the master patient index has failed to link.

Kindred Long-Term Acute Care Hospital. The purpose of our visit to Kindred was to see a demonstration of the IHIE’s Docs4Docs portal. This LTAC site receives

² As reported by Dr. Overhage, an aggregation of data from different emergency rooms was used to detect a recent outbreak of gastro-intestinal illness caused by food-borne bacteria.

³ <http://www.regenstrief.org/medinformatics/i3/clinical-care/docs4docs>.

patients from all surrounding hospitals, including Wishard. Their average length of stay (LOS) is 25 days, with an average census of 30 patients. The demonstration emphasized the utility of Docs4Docs--instead of rummaging through a paper-based inbox, or (less likely) a not always up-to-date paper chart, physicians can find the lab (or other encounter) result they want and display it. Optionally, the result can be displayed in the context of all recent encounters. The fact that the portal made these results accessible from any Web browser and displayable along with past results over time is viewed as a powerful feature; again, the principle early benefit of the portal is that a physician can retrieve recent results (from subscribing hospitals) for any patient (known to the system) from any web browser, and display them, aggregated in a graph, if appropriate. We were told that demand to have feeds available from the portal exceeded current personnel resources, and that the project--funded initially by grants--was modestly cash-flow positive from hospital subscription fees.

Wishard Health Services and Lockefield Village Rehabilitation and Healthcare Center. Wishard Health Services provides a spectrum of health care for older persons, including sub-acute care, extended/long-term care, outpatient/ambulatory care, and house calls for seniors, under one umbrella, the Acute Care for Elders (ACE) unit. It is a county-managed system staffed by university faculty and surrounded by other hospital chains, including Clarian (which also is part of the IU campus). By its mission, but to some extent also by patients' choice, Wishard's patient population is largely low-income. Their payor mix is 35.7% uninsured, 27.3% Medicaid, 22.5% Medicare (mainly FFS), 9.7% commercial, and 4.8% other. Wishard Hospital has an ACE Unit and an SNF (Lockefield Village), which also was visited by the team. The electronic Regenstrief Medical Record System was first developed in the Wishard system, and Wishard is unsurprisingly a participant in the IHIE. Wishard will complete deployment of mandatory e-prescribing processes for its physicians in January 2007.

Beverly Enterprises at Brookview is a nursing home with a Part A SNF, a dementia unit, and long-term care services. It is one of hundreds of facilities that are part of the national Beverly chain. The LOS for Part A patients is 37 days and occupancy is usually in the mid-90%. The IHIE was in communication with a Beverly Corporate representative concerning potential participation in the IHIE until that representative left Beverly during a recent reorganization. At the time of the writing of this report, there is no action being taken by either the IHIE or by Beverly Brookview to join the Network. However, Beverly Brookview has reported renewed interest in participating in the IHIE.

Beverly Brookview uses an EHR called VistaKeane that is used throughout all corporate facilities and maintained by corporate headquarters in Fort Smith, Arkansas. Floor staff entries--created by entering data on touch screens located outside of patient rooms--are monitored closely by supervisors within the facility as well as within the corporate office. The corporate office keeps a tight rein on each of the facilities. Beverly Brookview's copiers and fax machine have digital scanning capabilities and are able to create, receive, and transmit digital documents for representation in a corporate document repository (Documentum).

Reportedly, Beverly corporate information technology can and does deploy enhancements to their information technology systems nationally if they are of sufficient importance.

VNS Healthcare System of Central Indiana is the largest HHA in Indiana. Established in 1913, it has 212 full-time employees. The VNS is the preferred provider for seven hospitals (i.e., there is a formal affiliation with these hospitals). At Wishard, they have a clinical liaison in the hospital who has access to the hospital's EHR. The liaison also can access information for referrals that come from the ambulatory clinic and begin the process of populating the home health agency's electronic record using a laptop.

The VNS recently upgraded to the MISYS system, previously having used McKesson. They are exploring a physician portal but this is not imminently available. They are heavily invested in telehealth (currently with 101 units) and plan to have 200 Honeywell units in operation by the end of 2007.

When asked about the IHIE, John Pipas, the CEO was familiar with the HIE's activities in general, but to date, they have not been asked to participate, nor have they indicated to the IHIE group that they are interested in participating but would consider options if offered.

Briarwood Rehabilitation is a for-profit, long-term care facility with a Part A SNF. They have 113 skilled beds and an average LOS of 60-90 days. They use MDI for their MDS reporting and claims submission and do not have any future plans to implement an interoperable EHR system.

See Table E.1 at the end of this appendix for a comprehensive compilation of the information requested from and supplied by each site, prior to their scheduled site visit.

II. SPECIFICS ON CLINICAL DATA SHARING

1. What data are shared? What data should be shared but aren't?

Wishard Hospital considers the discharge summary, insurance information, medication list, allergies, problem list, and advance directives among the core information needed at time of transfer.

SNF staff at **Lockefield Village** comment that they rarely receive information about a patient's mental status and behavior prior to transfer. When it is provided, it is sometimes incomplete.

The most common information that **Beverly Brookview** does not always receive from referring hospitals including Wishard is the discharge summary (again because it

may be dictated later by the attending physician). Beverly Brookview has a full-time “recruiter” who visits acute care facilities to obtain patient information regarding potential Beverly Brookview patients. The information obtained is passed to an RN in charge of Brookview admission (or denial of admission).

When an urgent problem requires that a patient be transferred to a hospital, the Beverly Brookview person in charge of medical records helps to complete a handwritten form that includes a current medication list, recent laboratory results, insurance status, skin status, code status, physician name and contact, and facility contact. Many of these data elements are gathered from the Beverly Brookview computer but are handwritten onto the form. Beverly Brookview's patient records are reviewed once every 24 hours by remote care providers who can contact Beverly Brookview care providers if something in the record signals a potential problem.

Briarwood commented that the two data elements found to be missing with the highest frequency from referring hospitals are wound status and behavioral status.

2. How are the data shared?

The **Wishard Hospital** EHR can produce an abstract/clinical summary for patients as they enter an ED. The summary includes the reason for visit, a problem list, medications prescribed (that may or may not match what medications actually are taken), recent dictations available, recent laboratory results, recent radiology results, and immunizations. Advance directives are not part of the summary. An unusual feature of the system is a means by which the ED can update the ED summary and then send it with the patient back to the facility, but updating happens only infrequently.

At **Wishard's Lockefield Village extended-care facility**, the EHR is available to retrieve data and also has integrated provider order entry in part of the facility, which is physically located on the Wishard campus, adjacent and connected to Wishard Hospital. Physicians, physical therapists (PTs), and nurses (RNs) can access information from the hospital prior to transfer and during transfer as needs arise. Some of the MD and RN charting is in the EHR but physical therapists only enter the final note/discharge summary. On Lockefield Village floors without provider order entry, SNF medications are not managed via the EHR. Lockefield Village also provides long-term care, but most of the charting is paper-based and separate from the EHR.

When patients leave the Part A SNF at Lockefield Village, communication with the receiving HHA is via phone and fax. This is an example of the lack of “informational continuity of care” that the Regenstrief gero-informaticians would like to overcome. **Beverly Brookview** made a related observation indicating, for example, that patients sent to the emergency department with potential internal bleeding sometimes were returned with the bleeding stopped but without information on what was done during the stay in the emergency room.

Extended Care Information Network (ECIN) is used by some of the referring hospitals, but referrals are largely made based on personal relationships between discharge planners and intake coordinators.

At **Briarwood**, a paper "standard transfer summary" is prepared when patients are transferred to the ED and a verbal report is called into the ED. This summary includes the reason for transfer, demographics, problem list, medications, allergies, and recent laboratory results.

When patients are discharged from **Beverly Brookview** to home health, information is printed from their EHR or photocopied from the chart.

The **VNS** does not share data contained in their MISYS with **Wishard Health Services** or any other hospital.

3. Timeliness and completeness of the data.

In general, the SNFs and HHA visited indicated that the Indianapolis area hospitals provide relatively complete data at the time of discharge. The exceptions to this would be that behavioral issues, wound assessments, and the other locations in which the patient/resident were recently treated often are missing. For home care, the Primary Care Physician (PCP) information often is not there, making it more time-consuming for the home health agency to locate and interact with the patient's primary physician.

The staff at the **VNS** also mentioned that the discharge summary is faxed to them-- if it is coming from the medical side of the hospital it generally has good documentation; if it is coming from the surgical side, the documentation is often incomplete. Their biggest issue, however, is that the discharge summary often is not available at the time of discharge (e.g., the physician having not yet dictated her/his orders).

As observed on other site visits, securing information about potential patients on a timely basis is a high priority task, the successful completion of which often depends on long-standing personal relationships between acute care and long-term care personnel.

4. Specifics about medications, labs, and radiology.

The IHIE Docs4Docs portal provides access across care sites to discharge transcriptions, laboratory results, and radiology. At present, medications have not been configured. The portal is supported financially by the large hospitals in the Indianapolis metro area. **Kindred LTAC** has access to the IHIE Docs4Docs portal and recently has begun to use it.

For **Wishard Hospital** patients, 80% of outpatient medications are dispensed from the Wishard-based pharmacies.

Beverly Brookview uses a single pharmacy, Pharmerica, (a national chain). Communications with the pharmacy are via fax. They also contract with a single laboratory, DCL Laboratories. The initial order is faxed, but staff can dial in to get results. The lab results also are provided via fax, but the results are not entered into VistaKeane.

At **Briarwood**, laboratory tests are ordered via fax and results are received via fax. Pharmacy orders are faxed.

At the **VNS**, communication with pharmacies is currently by fax; however, this will change once e-prescribing is initiated. Lab results are obtained via fax and placed in a paper chart.

5. Areas under development (e.g., CPOE, decision-making tools).

Beginning January 2, 2007, all prescribing will be electronic in the State of Indiana.

The **VNS** is exploring a physician portal but this is not imminently available.

The **IHIE** is working with the Centers for Medicare and Medicaid Services (CMS) to import Medicare claims data (encounters, tests, procedures) that could support multiple efforts including performance measurement reporting. Reportedly, this also would include MDS, OASIS, and Part D data.

Doc4Docs will increase its coverage of regional health care encounter records. Currently, most information comes from the five initial participating hospitals. Aside from the fact that they help provide financial support, their pre-processing (homogenization) of the data makes it easier for Doc4Docs to perform its processing. However, gradually Docs4Docs will start collecting the information from the original source (e.g., a laboratory, instead of from the hospital that ordered the lab test, or from a pharmacy instead of the enterprise that ordered the medication). The portal has regional completeness as a goal for both laboratory results and medications.

6. Barriers to clinical data exchange.

The primary barriers to clinical data exchange identified were the general lack of access to another provider's existing electronic health record system, as all sites had some access to the Internet and all sites had at least some level of electronic record keeping. As all sites can support web-access, even if only by (rarely) dial-up, Docs 4 Docs should help reduce this barrier.

The post-acute and long-term care providers were largely unaware of the IHIE initiatives and activities. They have not been invited to join, nor have they initiated joining, largely because of the lack of knowledge that this exchange exists.

7. **Facilitators to clinical data exchange.**

Referrals from **Briarwood** to home health often involve an on-site evaluation by the home health liaison who is permitted to collect information concurrently.

At **Wishard Hospital**, the **VNS** has a clinical liaison who has access to the EHR. The liaison begins the process of populating the MISYS record using a laptop.

Beverly Brookview has a highly developed manual, paper, and fax-based patient recruiting and admission process supported by two full-time employees (FTEs).

The **IHIE** is starting to facilitate data exchange, at least with the five major hospitals in the Indianapolis area. These hospitals collect and refine information from a variety of other sources, such as clinical laboratories.

The **VNS** care providers, often deployed from home, use laptops to upload patient encounter information and to download visit assignments. Currently, care providers tend not to make use of laptops when they are with patients.

All sites make use of HIT to at least some degree, all sites are connected to the Internet (though not all have high-speed connections), and all sites make use today of phone, fax, and paper-based access to remote information.

III. **TECHNOLOGY**

1. **Hardware and software descriptions of the main health delivery system and the affiliated PAC/LTC settings.**

The IU (Regenstrief) EHR makes use of commodity servers that run a dialect of MUMPS; order entry via these servers is accessible through hospital Local Area Networks (LANs) by early generation (commodity) PCs running a now obsolete version of Microsoft Windows, or increasingly via Windows-based Citrix sessions for remote deployment and management. Data retrieval via EHR can be accomplished via the older text-based interface or by the web, using common web browsers with a Secure Sockets Layer or Virtual Private Network.

Docs4Docs makes use of a server-based data repository of data loaded from the EHRs of five hospitals; this server is accessible through web-based browsers.

2. Architecture of EHR system at main HDS.

- a. Are the sites visited using CHI-endorsed and other HIT content and messaging standards? If so, which ones are they using? Messaging? Vocabulary? Direct care FM?

Except for the use of LOINC in the Indiana Network for Patient Care (INPC), use of CHI-endorsed standards is incidental at all sites (i.e., such standards are used only for regulatory or reimbursement reasons).

- b. Description of each EHR system and HIT solution(s) to support HIE.

As described, **IU** makes use of a legacy, locally developed, MUMPS-based EHR. **Beverly Brookview** uses VistaKeane; the **VNS** uses MISYS; and for the present, **Briarwood** is content to continue to make use of largely paper-based processes.

INPC supports emergency department results retrieval from the EHRs at five hospitals to the emergency departments at the five hospitals; feedback of encounter or summary information from the emergency departments to the relevant remote EHR is not generally implemented.

Docs4Docs permits hospital-associated physicians to retrieve results residing in the EHRs of the five participating hospitals. Often these physicians are associated with more than one hospital or care site.

The nursing homes visited do not yet participate in either the INPC or Docs4Docs, though they might wish to if they had the opportunity.

- c. If the sites visited have used "best of breed," how are these different software integrated?

The INPC and Docs4Docs process "streams" of data from hospital EHRs; sometimes these streams contain HL7v2 messages. No other inter-site integration was observed.

3. Architecture of EHR systems at PAC/LTC (if applicable) and HIT solution(s) to support HIE.

Both INPC and Docs4Docs make use of a central data repository. INPC is accessible from emergency department terminals. Docs4Docs supports web-based access.

4. How are the data stored? Shared? Accessed? Transmitted? Accepted at other setting? Entered?

All data are stored in MUMPS file systems (in the case of IU) or in the proprietary databases of the EHR or other record keeping applications for the other sites. Data from INPC and Docs4Docs make use of evolving messaging and web technologies specifically selected by Docs4Docs developers to be the best near-term solution. While the Docs4Docs application will be a very powerful demonstration of the utility of “anytime, anywhere,” access, it is not being designed to be a national solution; instead, continued local success and growth is its objective.

5. How are the sites visited tackling any interoperability issues using standards-based EHR systems or other HIT solutions for health information exchange?

Both the INPC⁴ and IHIE⁵ make use of HL7v2 messages and LOINC. The remaining aspects of these interoperability solutions make use of pragmatically determined, local “best practices.”

6. How does electronic health information exchange (e-HIE) vary between affiliated and unaffiliated providers within a single HDS?

The **IU** and **Wishard** use a single integrated EHR system. The five major hospitals in Indianapolis participate in the INPC and the IHIE. At present, neither the INPC nor the IHIE are available to NHs.

7. How does e-HIE vary when exchanging to outside entities?

“Outside” entities must, at present, obtain information from IU and other IHIE hospitals through the traditional methods--fax, paper, and telephone.

IV. ORGANIZATIONAL ISSUES

1. Adoption of EHR systems and Electronic Health Information Exchange with PAC/LTC.

Regenstrief Institute and **IU** were trailblazers with regard to developing their EHR system, the RMRS (Regenstrief Medical Record System). They established the INPC, which is the cornerstone of the IHIE model for data exchange. The EHR and INPC systems were established well before CHI-standards were selected.

⁴ http://www.tkgnet.com/conference/summer2005/presentations/Clem_McDonald.pdf.

⁵ <http://www.ncvhs.hhs.gov/050608tr.htm>.

The business case for the IHIE is relatively simple. Physicians and other clinicians value having access to previous encounters because it allows them to provide better care and because it will reduce costs by minimizing the duplication of tests and procedures, and it will enable physicians to determine more accurate diagnoses because they will have a more complete picture of the patient's recent medical history.

Today, it is not a major goal for the IHIE to get an EHR into physician offices or post-acute/long-term care settings. The IHIE has plenty of work to do with the current and planned participants in the network, and although our impression is that they would welcome involvement by the PAC/LTC community, they are not going to actively recruit them into the HIE at this time.

For **Beverly Enterprises**, their EHR system was selected by the corporate office and all 300 facilities are required to use it. Likewise, any interfaces with other systems at the local level (e.g., Indianapolis), would first need to be approved and paid for by the corporate office. The Administrator did note that in vetting the software companies, use of standards was a criterion, which is one reason they selected VistaKeane. However, interoperability with other systems does not appear to be a current feature, or an immediate concern for Beverly Enterprises.

The **VNS** enjoys the status of being the largest home health agency in the area and is the preferred provider for many feeder hospitals. Interoperable EHR systems have not been a consideration to date, nor does it appear to be a near-future goal for John Pipas and his staff at the VNS.

Briarwood expressed no future plans to improve upon their current MDI software. Interoperability and the exchange of electronic data between their LTC facility and other health settings is not a priority at this time. They would be very happy to receive complete, legible, timely information via fax or phone.

2. Standards Development Organizations

With the exception of faculty and staff at **IU**, the **Regenstrief Institute**, and the **IHIE**, no other group reported being involved in any standards development organizations (SDOs).

V. CONCLUSION/FINAL THOUGHTS

The Indianapolis INPC and IHIE form the leading RHIO in the United States, a lead that may only increase once the IHIE obtains medication information and primary care encounter reports. The coverage of the IHIE appears to be scalable to the region and should achieve this coverage within a few years--at least for area physicians. A critical requirement for the success of the INPC, and later for the IHIE, was the trust originally cultivated by Dr. McDonald that information from one hospital would not be misused by

another (e.g., competitive uses). Once this trust was established, the remaining problems were technical, and therefore solvable.

The Regenstrief software and system development paradigm has enabled the timely creation of incremental utility sufficient to produce and sustain Indianapolis' current pre-eminent position. When combined with the use of commodity hardware, powerful systems can be built quickly and inexpensively. Were such systems built using current CHI-endorsed standards, they would be a replicable model for RHIOs throughout the country. Regardless, the INPC and IHIE are a model that can raise consciousness nationally regarding what can be accomplished given the organization will and resources to do so.

Finally, "a rising tide carries all boats." While the INPC and IHIE are not aimed at nursing homes and/or home care, their success should help these enterprises. The latter are already making local use of HIT and were appropriate standards in place, the cost of connecting to the INPC and IHIE would be modest.

TABLE E.1: General Health Information Supplied by Visited Sites*

Name of Health System	Indiana Health Info. Exchange/ Regenstrief Institute	Wishard Health Services	Lockefield Village (Wishard-owned SNF)	Kindred Long-Term Acute Care Hospital	VNS Healthcare System	Beverly Healthcare Brookview	Briarwood Health and Rehab. Center
Location	Indianapolis, IN	Indianapolis, IN	Indianapolis, IN	Indianapolis, IN	Indianapolis, IN	Indianapolis, IN	Indianapolis, IN
Relationship to Host Site	Host Site	Host Site		Application Demo Site			
Year established	IHIE Feb 2004 Regenstrief about 35 years ago			1992	1913	1967	1998
Area served (urban, rural, both)	Both			Both	Urban and rural 30 counties	Urban	Urban
Ownership	Non-profit			Corporately owned	Non-profit, freestanding	For profit, privately held	For profit
No. full-time employees	16 IHIE			113	212 FTE	89 FTE	
No. of Nursing Homes (owned, affiliated)	0			0 owned 7 affiliated	0 owned 0 affiliated	0 owned 0 affiliated	0 owned 14 affiliated
No. of Home Health Agencies (owned, affiliated)	0			0	1 owned 7 preferred providers affiliated	1 owned 0 affiliated	0 owned 1 affiliated
No. of Physician Practices (owned, affiliated)	0			0	0 owned 0 affiliated	0 owned 0 affiliated	0 owned 0 affiliated
Are physicians affiliated with health delivery system or are they independent?	n/a			Practicing physicians are with Indiana University	Independent	Independent	Independent
Inpatient pharmacy?	0			Yes	No	No	No

TABLE E.1 (continued)

Name of Health System	Indiana Health Info. Exchange/ Regenstrief Institute	Wishard Health Services	Lockefield Village (Wishard-owned SNF)	Kindred Long-Term Acute Care Hospital	VNS Healthcare System	Beverly Healthcare Brookview	Briarwood Health and Rehab. Center
Does SNF use dedicated pharmacy or contract with large/retail, or multiple pharmacies?	n/a			Unknown	Hospice program contracts with one pharmacy	1--Pharmerica Pharmacy	Dedicated
No. of Pharmacies--outpatient	0			0	1	0	0
In-house laboratory?	0			Yes	No	No	No
How many outside laboratories?	n/a			Unknown	Minimum of 20 outside labs	1--DCL Laboratories	1
In-house radiology department?	n/a			Yes	0	No	No
How many outside radiology centers/MR centers do you work with?	1 or 2			1	8-12 centers	1--Mid-West Radiology	1
Percentage of overall budget dedicated to IT?	Not answered			Unknown	5%		
Electronic Health Record (EHR) system--scheduling, billing, or claims?	Working towards that throughout the community--many of these services are in place at Regenstrief/ Wishard			0	Yes	Yes, EDS	Yes--billing/ claims submission for MDS purposes only
<u>Clinical</u> Electronic Health Record (EHR) system?	See above			In-house system	Yes	Yes	MDI--for MDS reporting only
Primary software vendor for electronic health information system (if applicable)	Developed internally			Internal	MISYS Telehealth Honeywell HomMed	VistaKeane	MDI--for MDS purposes only

TABLE E.1 (continued)

Name of Health System	Indiana Health Info. Exchange/ Regenstrief Institute	Wishard Health Services	Lockefield Village (Wishard-owned SNF)	Kindred Long-Term Acute Care Hospital	VNS Healthcare System	Beverly Healthcare Brookview	Briarwood Health and Rehab. Center
Short-term (6 months?) HIE* future plans	Continue expansion of clinical messaging			Continue utilizing current internal system and available community resources	Having an internal EMR set up and interfaced with disease management and telehealth programs. Looking for potential web access by physicians, patients, and families to the telehealth program.	No	No formal plans
Long-term HIE* future plans	Same as above with further development of clinical quality initiative			Not established	To have web access portal for patient information to be reviewed by physicians	No	No formal plans
* Information in this table was collected from a "General Information About Health Care Setting" form sent to all sites prior to the scheduled site visit.							

HEALTH INFORMATION EXCHANGE IN POST-ACUTE AND LONG-TERM CARE CASE STUDY FINDINGS

Files Available for This Report

Final Report

HTML: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase.htm>
PDF: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase.pdf>

Appendices

All Appendices

HTML: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-A.htm>

Appendix A: Draft Case Study Plan

HTML: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-A.htm#appendA>
PDF: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-A.pdf>

Appendix B: Site Visit Report--Erickson Retirement Communities, Catonsville, Maryland

HTML: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-A.htm#appendB>
PDF: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-B.pdf>

Appendix C: Site Visit Report--Montefiore Medical Center, Bronx, New York

HTML: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-A.htm#appendC>
PDF: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-C.pdf>

Appendix D: Site Visit Report--Intermountain Health Care, Salt Lake City, Utah

HTML: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-A.htm#appendD>
PDF: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-D.pdf>

Appendix E: Site Visit Report--Indiana Health Information Exchange, Indianapolis, Indiana

HTML: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-A.htm#appendE>
PDF: <http://aspe.hhs.gov/daltcp/reports/2007/HIEcase-E.pdf>