Technology Issues in Getting Communities Connected

Practice and Laboratory Interoperability

Interim recommendations of eHealth Initiative Foundation’s Working Group for HIT in Small Practices

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Why Health Information Exchange?

• U.S. healthcare system highly fragmented….data is stored--often in paper forms—in silos, across hospitals, labs, physician offices, pharmacies, and insurers

• Public health agencies forced to utilize phone, fax and mail to conduct public health surveillance, detection, management and response

• Physicians spend 20 - 30% of their time searching for information…10 - 81% of the time, physicians don’t find information they need in patient record

• Clinical research hindered by paper-based, fragmented systems – costly and slow processes
Health Information Exchange Value

• Standardized, encoded, electronic HIE would:
  – Net Benefits to Stakeholders
    • Providers - $34B
    • Payers - $22B
    • Labs - $13B
    • Radiology Centers - $8B
    • Pharmacies = $1B
  – Reduces administrative burden of manual exchange
  – Decreases unnecessary duplicative tests

From Center for Information Technology Leadership, 2004
Standards and Policies to Achieve Interoperability

- Interoperability is critical to success, but concepts of interoperability are varied:
  - Uniform business processes.
  - Controlled medical terminology and commonly accepted business transaction definitions.
  - Communication protocols that comply with security requirements.
  - Reference implementations, open specifications, and software interoperability "workbench".
  - Data standards allowing data exchange via standardized data streams among entities with software systems that are not integrated.

From HHS *Summary of Nationwide Health Information Network (NHIN) Request for Information (RFI) Responses, June 2005*
Interchange vs. Interoperability

- **Main Entry:** *interoperability*
  : ability of a system ... to use the parts or equipment of another system
  
  Source: Merriam-Webster web site

- **interoperability**
  : ability of two or more systems or components to exchange information and to predictably use the information that has been exchanged.
  

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From Wes Rishel
The Challenge: A Complete Interoperability Profile

- **Standard Messaging**
  - Format
  - Structure
  - Terminology
  - Coding
- **Secure Conveyance**
  - Encryption
  - Transport
  - Authentication
- **Network Services**
  - Patient locator service
  - Terminology service
  - CDS rule source

- **Other mutual security issues (trust)**
  - User identification and authentication
- **Privacy Issues**
  - Accurately linking patient records
  - Patient control
- **Business issues**
  - Workflow
- **“Organizational interoperability”**
  - Contracts and agreements
Incremental Implementation

• Top 3 starting places
  – ePrescribing/Medication History
    • e.g., Connecting for Health Reference Implementation
  – eLaboratory Interoperability
    • e.g., Connecting for Health Reference Implementation
  – Transfer of Care/Summary Referral Document
    • e.g., Taconic IPA
Conclusion

• The eHealth Initiative Foundation’s Working Group for HIT in Small Practices concluded:
  – Electronic interoperability between small practices and the rest of the healthcare environment requires a universal, ‘plug-and-play’ Implementation Guide for each type of such connectivity.
  – Practice and Laboratory connectivity is the ideal starting place because:
    • there is incentive to overcome the barriers and implement it, and
    • tools currently being developed to allow it to be done well.
  – This is a good pilot and model for more complete, cost-effective healthcare interoperability that will lead to improving healthcare quality and patient safety, as well as reducing the total cost of healthcare.
Conclusion

• The eHealth Initiative Foundation’s Working Group for HIT in Small Practices has concluded:
  – Electronic interoperability between small practices and the rest of the healthcare environment requires a universal, ‘plug-and-play’ strategy for implementing each type of such connectivity and a common system for securely transporting the messages.
  – Practice and Laboratory connectivity is the ideal starting place for this because:
    • there is incentive to overcome the barriers and implement it, and
    • tools currently being developed allow it to be done well.
  – This is a good proof of concept for more complete, cost-effective healthcare interoperability that will lead to improving healthcare quality and patient safety, as well as reducing the total cost of healthcare.
Background

• Lack of practice / laboratory connectivity has:
  – prevented leveraging the benefits of Healthcare Information Technology (HIT) interoperability in the small practice setting and
  – frustrated clinicians and vendors seeking to implement Electronic Health Record (EHR) systems.

• Much has been blamed on the high cost of custom interfaces
  – estimated at $30,000 to $50,000 per laboratory.

• Report makes 12 recommendations that comprehensively examine the problems and opportunities and propose a two year roadmap to a solution.
  – Executing this roadmap will require the collaborative partnership of hospitals, payers, laboratories, HIT vendors, and the government to reach the goal of plug and play laboratory interoperability.
Process

- This report is the result of meetings and conversations that took place between October 2004 and June 2005 between small practice clinicians, EHR vendors, and laboratories regarding the state-of-the-art of laboratory-to-practice connectivity.
  - The proposed roadmap responds to the recommendations of the Health Information Technology Leadership Panel Final Report of March 2005 that recommends applying available technology solutions even when they are sub-optimal and building public private partnerships because the benefits of information technology are too great to wait for identifying ideal solutions.
Definition of eLaboratory

- eLaboratory is the electronic delivery of laboratory results to practices so that such data may be integrated into electronic patient records in a full EHR system, or used by a dedicated application to view structured, context-rich, and/or longitudinal laboratory results on a patient.
- eLaboratory includes closing the orders loop, documenting the review of results by clinicians, and their communication to the patient.
- The full benefits of eLaboratory are not achieved until the results are used as input into Clinical Decision Support systems.
Overcoming Barriers

• EHR systems can play a major role in enabling practitioners to utilize the clinical laboratory data to better care for their patients.
  – Specifically, practitioners need electronic systems that enable them to follow relevant laboratory results to optimize therapy for an individual patient and also monitor the care of their overall patient population.
• Numerous barriers exist in achieving these goals and the inability of the current generation of EHR systems and laboratory information systems (LIS) to routinely interface with one another presents a considerable technical obstacle.
  – Standards for result reporting and test ordering must be developed.
  – CHI endorsed vocabularies such as LOINC and SNOMED-CT must be implemented and used routinely.
  – EHR system vendors should assure that their products have the ability to integrate data, including laboratory information, in a manner that supports care management through the use of clinical reminder systems, clinical decision support systems, practice and practitioner level quality reports, and other quality improvement activities.
  – The DOQ-IT project sponsored by CMS is an example of these efforts (see www.doqit.org).
EHR Systems for Smaller Practices

• Many EHR systems were designed to meet the business needs of hospitals and other integrated healthcare delivery systems
  – In many cases, this may be inconsistent with the business needs and work flows of smaller medical practices that do not have internal laboratory and pharmacy support.

• Simplified EHR architecture could greatly accelerate the rate of adoption and decrease on-going maintenance costs.
  – allow an EHR system to interface with multiple external data sources
  – without maintaining unnecessary internal representations of the various test menus or formulary data
1. Clinicians Want Electronic Results from Laboratories

• Clinicians place a high value on receiving laboratory results from multiple laboratories and incorporating those results into a single electronic record.

• Certification of plug and play interoperability of laboratory results will accelerate small practice adoption of EHR systems.

• Web portals, faxes, remote printers, and scanned paper documents do not result in true interoperability and will not produce an integrated electronic health record.
2. Laboratories Want Electronic Orders from Clinicians

• Laboratories place high value on connectivity with small practices primarily because of the value of clean and complete laboratory orders.

• Much work is needed to refine and implement standards for electronic ordering of laboratory tests and direct communication of orders from a practice to the multiple laboratories used by the practice.
3. Understand Differences Between ePrescribing and eLaboratory

- Electronic prescribing has been a model of success for the adoption of HIT, but important differences between ePrescribing and eLaboratory require development of a different business case and approach.

- Many of the factors that contribute to the success of ePrescribing can be used to assist development of eLaboratory, such as independent certification of sending and receiving applications, but development of stand-alone national clearinghouses for laboratory data is not necessary and is unlikely to be part of a cost effective solution.
4. Implement One Standard Solution

- Clinicians receive laboratory results from many different laboratories including reference laboratories, hospital laboratories, and clinician office laboratories.
- To be cost-effective, a single communications method for electronic connectivity must be implemented that is applicable for all sources of laboratory data, rather than a different method for each point-to-point connection.
- Hospital laboratories must communicate directly with small practices and may require regulatory pressure to offer this vital service.
- Adoption of common communications standards by the two largest national reference laboratories, LabCorp and Quest, will rapidly advance the solution and encourage participation by all other laboratories and LIS vendors.
  - Their full participation in this eHI project and the California Health Care Foundation (CHCF) EHR-Laboratory Interoperability and Connectivity Standards (ELINCS) Technical Working Group. should be commended.
5. Require HL7 Standard Laboratory Messages

• Implementations of standards for laboratory messages vary considerably, limiting the ability to reuse unmodified EHR software for communication with different laboratories and in different parts of the country.

• The Implementation Guide being developed by the CHCF ELINCS project holds great promise for specifying the message standards to the rigorous degree necessary and for facilitating certification of conformance.

• This work must be extended to include microbiology and other non-numeric results, full coding of result values, and laboratory test ordering messages.
6. Require Standard Terminology in Laboratory Results

• Uniform use of laboratory terminology, coding, and vocabularies are essential to successful import and merging of data from multiple sources.

• LOINC codes provide an appropriate framework and a good organizational structure for maintaining the database used to identify test values.

• More work is needed on the use of SNOMED and on improving universal and uniform use of LOINC coding for laboratory test orders and results.
7. Require Standard Transport for Laboratory Messages

• There is considerable variability in the methods used to transport laboratory result messages from the laboratory to the practice and much of the work and cost of custom interfaces is devoted to creating these custom transport protocols.

• There is an urgent national need to create a single national standard for using the Internet to provide secure delivery of laboratory messages.
8. Incorporate eLaboratory Functionality into EHRs

- Electronic delivery of laboratory results to practices creates a need for specific functionality in the EHR systems that will import the data.
- The essential functions include closing the orders loop (verifying that results have been received for all tests ordered), documenting clinician review of results and appropriate notification of the patient, and efficient display of results.
9. Share Laboratory Results Carefully Beyond the Ordering Clinician

- Laboratory results often need to be shared with individuals other than the ordering clinician, such as other clinicians, patients, and payers.
- While the messaging standards should include a provision to send a copy of results to another clinician when the results are expected, out of context provision of unsolicited results should be discouraged.
10. Improve Patient Safety and Healthcare Quality with e-Laboratory

• The most important benefits of electronic delivery of laboratory results to practices will come from using that information as input to Clinical Decision Support Systems (CDSS).

• Availability of electronic laboratory results should lead to increased use of clinical decision support in ambulatory EHR systems and will also require improved means of distribution of clinical guidelines and decision support rules and algorithms.
11. Understand the Costs, Benefits, and Incentives

• The economic impact of electronic laboratory result delivery to practices is difficult to predict.
• While there may be some reduction of redundant tests from more complete information delivery and sharing of results, it is likely that decision support, reminders, and better access to information will increase the number of non-redundant tests ordered.
• This tension between the two effects may produce a smaller than expected net decrease in testing costs, or even result in increased costs.
12. Follow a Two Year Roadmap to the Vision

- Universal access to electronic laboratory-to-practice connectivity can be achieved in two years by following a sequential roadmap to provide the key components at lowest possible cost to small practices.
  - Rigorous implementation guides for laboratory messages should be produced and used for certification by federally sanctioned bodies for both EHR systems and laboratory information systems by January 2006. This process should expand with the addition of Microbiology results and order messaging by January 2007.
  - A nationwide secure message transport protocol should be in place by June 2006 to support delivery of laboratory messages over the Internet. Leveraging the existing Public Health Information Network Messaging System (PHIN-MS) based on ebXML is one strategy to facilitate rapid deployment of an interim solution.
  - Hospital laboratory systems should begin to offer routine electronic delivery of laboratory results to practices using standard result messaging and transport protocols rather than web portals by January 2007. Sharing of practice EHR results with hospital EHR systems at the time of hospital admission should also begin by January 2007.
  - Expanded use of CDSS and incentives for outcomes improvement and performance reporting using electronic data should be in place by June 2007. These types of incentives and a phased approach to them are discussed in detail in eHealth Initiative’s Parallel Pathways for Quality Healthcare: A Framework for Aligning Quality and Health Information Technology.
Questions?

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