Small Steps, Big Standards: How Data Standards Help Connect Pennsylvania Providers

By Jim Younkin

A study authored by the Center for Information Technology Leadership found a completely interoperable healthcare system (that is, each organization could share every piece of its healthcare information with another organization as discrete and normalized data) could yield annual savings of $77.8 billion.[1]

The Keystone Health Information Exchange's (KeyHIE) experience in Pennsylvania suggests that this healthcare data nirvana is a long way off. Yet the HIE found that there are small, practical steps that can move the healthcare industry to interoperability and bring immediate value to the clinicians that desperately need useful, actionable information in a format that is easy to use.

Leveraging common data standards is central to delivering that value.

Connecting Providers and Data

KeyHIE started by connecting disparate organizations through a single, clinical Web viewer that allowed clinicians to find their patients and see the facilities where the patient had been treated. This was based on the work of the Markle Foundation and Connecting for Health's Common Framework.[2]

To make this work the HIE requires an enterprise master patient index (EMPI) to link the patient's information from multiple sources and a record locator service (RLS) to maintain the list of patient encounters. Both the EMPI and RLS are populated by interfaces from the registration systems from each participating organization.

Most EMPIs use probabilistic-matching algorithms to determine if records from different systems belong to the same patient. However, no EMPI can match patient records with 100-percent accuracy unless the required information provided from all sources is both present and accurate.

Because it is better to err on the side of missed matches, the EMPI is usually tuned to fail to match two patient records that may belong to the same person but do not meet the scoring threshold. In these cases, HIM personnel are needed to review the records to determine if a match can be made. The investigation may require queries from other systems to the host system to obtain additional information needed to match or refute the patient records.

Due to the manual burden imposed by this process, some HIEs have opted to simply ignore unmatched records and treat them as separate patients. But to clinicians seeking information about their patients, it is extremely valuable to be able to view all of a patient's information in one place without worry that another record in the system may contain critical information they need to offer the best treatment.

The RLS is a directory that lists all the places a patient has received care. In Connecting for Health's model, the RLS contains only the date of the encounter and name of the organization where the patient was treated. KeyHIE's clinicians reported that they would like to see more information about the encounter to inform them as to whether they are likely to find useful information from that patient visit.

By taking additional information from the registration interface, KeyHIE was able to further populate the RLS with the name of the service, the attending physician, and the reason for treatment. Physicians were able to view all this information if the patient previously signed an authorization form to share it. Without the authorization KeyHIE displayed only the date and location of the encounter as simple directory information. A call to the HIM department would likely yield the additional

information, particularly in an emergency. The information displayed in the reason for visit column could be chief complaint, admitting diagnosis, or final diagnosis, depending on what was available from the source organization.

To avoid complex algorithms to determine which diagnosis to use if multiples were listed, KeyHIE simply linked them for the clinician to review and determine which, if any, were relevant. In many cases ICD-9-CM codes were used, with ICD-10 codes planned for future use.

HIM Professionals Needed

KeyHIE found that there are a number of ways HIM professionals can get involved with health information exchanges. They can provide expertise for HIEs in the tuning and maintenance associated with EMPIs. With knowledge of SNOMED CT and other terminology, HIM professionals can also help inform HIEs regarding the mapping of the CCD data elements.

The demand for these services will increase as more physicians adopt the use of EHRs and seek to share their records with other members of the healthcare continuum.

The Role of Data Standards

Once the patient has been identified and a clinician has determined that an organization has information that may be of value, the question arises as to how that information can be obtained and in what format.

KeyHIE's road map called for the use of a shared document store to allow each organization to publish the documents it normally shares with others so clinicians can access these documents from a common place as needed. It permits information to be viewed only for treatment purposes as defined by HIPAA, and patients must provide their authorization for these documents to be accessed.

KeyHIE selected a document repository based on the Healthcare Information Technology Standards Panel's recommendations, which uses the standard information-sharing profiles described by Integrating the Healthcare Enterprise (www.ihe.net). In this model, text-based documents such as discharge summaries, history and physicals, and radiology reports can be stored along with codified documents such as the Continuity of Care Documents (CCDs).

This allows all organizations to publish information to the HIE at the lowest, text-based level or more sophisticated codified information such as CCDs. Because the CCD includes codified information such as medication lists normalized using RxNorm, its contents can be integrated into an EHR system.

Other types of data such as problem lists may be described using ICD-9 codes, but some data types such as allergies have no full codes to completely describe them. Given the variety of clinical information that can be described in a CCD (e.g., advanced directives, allergies, comments, conditions, providers, immunizations, medications, care plans, procedures, vital signs, results), it is unlikely that the entire document can be entirely codified. However, it is possible that large sections of discrete data contained within the CCD will become semantically interoperable through the use of SNOMED CT as a standard code set.

KeyHIE participants also benefit from the delivery of laboratory results from a hospital lab directly into their EHR systems. This was made possible through the use of Logical Observation Identifiers Names and Codes (LOINC) as a standard for identifying laboratory test names.

KeyHIE assigned LOINC values to all lab tests from a community hospital laboratory and all lab tests used within a local EHR. When results are sent to the HIE, the HIE translates them using LOINC and files them into the EHR as discrete data. Clinicians have reported high levels of satisfaction with this solution, which allow them to graph and trend these results alongside other results that were performed by a local laboratory.

Notes

1. Walker, Jan, et al. "The Value of Health Care Information Exchange and Interoperability." Health Affairs Jan. 19, 2005. Available online at http://content.healthaffairs.org/cgi/content/full/hlthaff.w5.10/DC1.
2. Connecting for Health. "Notification and Consent When Using a Record Locator Service." Available online at www.connectingforhealth.org/commonframework/docs/P3_Notification_Consent.pdf.

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