The Business Case for HIE Use in Emergency Departments: Information Integrated With Workflow Is the Key

Use of HIE data in emergency departments (EDs) can produce financial savings which outweigh the costs of operating the HIE. Automating data integration into ED workflows is the key to adoption and benefit realization. The financial impact on hospitals is uncertain today, but more likely positive under accountable care, which has already begun.

The Search for an HIE Business Case

For much of their checkered history, public health information exchanges (HIE) have struggled to find a sustainable business model. Almost all of the CHINs, CHIPs, and RHIOs (earlier HIE acronyms) founded in the 1990s and 2000s have fallen by the wayside—the victims of politics, technical problems, and, especially, a lack of money.

Today we have improved technologies and technical standards, more government funding, and a changing reimbursement environment that favors information sharing, yet the financial challenges to HIEs persist. The most recent survey of US HIEs by the eHealth Initiative (2011 Report on Health Information Exchange: The Changing Landscape) identified their top challenge as “developing a sustainable business model.” Few respondents broke even on operational revenues (see below).

Figure 1. Few HIEs Are Breaking Even on Operations

These data beg the question: what is the ongoing economic justification for public HIEs? New evidence points to regional HIE use across EDs as an important part of the business case for public HIEs.

What’s the Problem?

When patients present in the ED, their records from other EDs, physician offices, and hospitals are not readily available. Usually there is no time to call and get copies of the patients’ medical records faxed, even if ED staff know where to call, so ED physicians rely on local hospital records, and what patients or their families can tell them, to understand the patients’ histories and current care regimens. This information gap leads to unnecessary testing, medication errors, adverse events, misdiagnosis, unnecessary hospital admissions, prescription drug abuse, and increased costs.

The use of HIEs to improve ED care across a health system or region by automatically presenting patient history in the ED is not new; however, two recent studies shed further light on what is required to succeed with ED HIE initiatives.
The MidSouth eHealth Alliance Experience

The most recent study, published in May 2012 (Frisse ME, Johnson KB, Nian H, et al. The financial impact of health information exchange on emergency department care, *J Am Med Inform Assoc*. 2012;19:328-333), describes the MidSouth eHealth Alliance, comprising 16 health care provider organizations, including all 12 major hospitals in the Nashville area. Hospitals contribute discharge summaries; laboratory, pathology and radiographic reports; other transcribed notes; and other clinical and administrative documents. Clinics provide demographic information, registration information, and clinical data.

Eleven of the 12 participating hospital EDs accessed HIE data using a specially designed web portal that showed a "white board" list of all patients registered in the ED over the past 24 hours and the number of records available from other locations. Information for individual patients could also be queried. Annualized HIE operating costs were $880,000 for the period of the study.

Researchers compared case-matched results for patients in which HIE information was accessed to those in which the HIE was not used, and calculated the relative chances of ordering the use of various clinical resources for those patient groups, after controlling for confounding variables. HIE information was accessed for only 6.8 percent of ED patients, yet researchers found that HIE use resulted in 191 fewer admissions than would have been predicted to occur without HIE use. However, HIE use resulted in 800 additional chest radiographs and 74 additional head CT scans (but no increase in other testing). Study participants we contacted thought this was because physicians looked up HIE data on sicker patients who likely needed more testing, and this was not fully accounted for in their study controls. In spite of that, annualized net cost savings were approximately $800,000.

In the twelfth Nashville ED (with two thirds of the study’s patients), triage staff printed HIE encounter summaries containing dates of service, primary complaint, and ICD-9 codes for each of the patient’s hospital encounters, and placed this information in the patient’s chart. In this ED summaries were printed for 10 to 15 percent of patients.

HIE use at the twelfth site alone resulted in 221 fewer admissions than would have been predicted to occur without HIE use. In a reversal from the other sites, HIE access resulted in 103 fewer head CT scans, 196 fewer body CT scans, and 258 fewer instances in which laboratory tests were ordered. The annualized cost savings for this site were approximately $1.2 million, bringing the total for all 12 sites to over $2 million—more than double the operating costs of the entire HIE. For all 12 ED locations the vast majority of the savings was related to avoided inpatient admissions.

A study author we contacted estimated that the financial impact of HIE-related utilization changes was neutral for participating hospitals, which paid no fees to the HIE during this study.

Contrast the Nashville experience with that of the Wisconsin Health Information Exchange (WHIE), which has access to less clinical information, but is more integrated into ED workflow and has a higher rate of data use in the ED. The WHIE, originally funded by a state Medicaid grant, began sharing data in local EDs in 2008; today 14 EDs use WHIE data, with more to come soon.

WHIE data include the reason for patient visits to hospitals, clinics, and other providers; name of primary care provider; emergency contact information; patient demographics; allergies; all state Medicaid claims data; pharmacy claims data; ADT history for participating providers; “lock in” data (limits on the patient’s pharmacy

Author: Douglas Thompson | June 5, 2012

© 2012 | 2445 M Street NW | Washington DC 20037 | P 202.266.5600 | F 202.266.5700 | advisory.com | 12-050
use); who the health plan’s care manager is and how to contact them; and informational clinician notes submitted to the exchange.

Compared to the Nashville HIE, WHIE’s use of HIE data in the ED is much more automated and universal. When the patient is registered in a participating ED, the HL7 registration message is automatically sent to the WHIE, which automatically pulls all available information for that patient from its repository and prints a summary report to the ED printer that is closest to the patient’s location. This report is then placed in the patient’s chart by ED staff (more detailed information can be accessed online). So all ED patient charts contain HIE data, although it is not known how frequently these were used by their physicians.

In a 2011 study (Tzeel A, Lawnicki V, Pembre KR. The business case for payer support of a community-based health information exchange. *Am Health Drug Benefits*, 2011:4[4]), researchers looked at Humana patients only, and found that patients whose WHIE data were used in the ED had costs $29 lower per visit than those in which WHIE data were not used (after adjusting for patient differences). Notably, this study excluded individual ED visits which resulted in a hospital admission, so the primary source of cost savings in the Nashville study was not examined.

Although specific figures were not published, study authors told us that Humana’s cost savings from their investment in the WHIE were more than double their costs.

**Lessons Learned**

- **Simple HIE structures**, focused on limited problems and applications, can deliver substantial value, and are easier to implement and justify financially.

- Preventing unnecessary care in emergency departments saves the entire health care system money, but has an uncertain impact on hospital finances under traditional reimbursement models. In our first case the hospitals broke even; in the second case the payor doubled its investment. **The situation is about to change**, as the first accountable care organizations (ACOs) became active in January 2012, more did in April, and more will in July 2012; and many hospitals are considering ACO participation starting in January 2013. In an ACO environment, any reduction in utilization and costs directly benefits the provider.

- **The more HIE data acquisition is automated and integrated into physicians’ workflow, the more frequently the data are used.** In our cases, when physicians had to go online to get HIE data, the data were used for 6.8 percent of patients; when others went online to get the data for the physicians, the use rate doubled; and when the entire process was fully automated, data availability was universal.

- **If your hospital is planning to participate in either an HIE or an ACO, strongly consider using HIE data in the emergency department.**

- **Evaluate your local ED payer mix** to determine the impact of reduced utilization on hospital revenues under current payment mechanisms, and **model the financial impact under future payment models** (e.g., accountable care).

- **Design the technology and processes for ED HIE use** to **fully automate data acquisition and insertion into the patient’s chart**; ideally these data would be integrated into the EMR for access by ED physicians.

- **Set up a monitoring mechanism** to measure the clinical and financial impacts of ED HIE data use; use the data from this mechanism to refine the technology and process for data acquisition and use.

**Action Items**

- **Simple HIE structures**, focused on limited problems and applications, can deliver substantial value, and are easier to implement and justify financially.

- Preventing unnecessary care in emergency departments saves the entire health care system money, but has an uncertain impact on hospital finances under traditional reimbursement models. In our first case the hospitals broke even; in the second case the payor doubled its investment. **The situation is about to change**, as the first accountable care organizations (ACOs) became active in January 2012, more did in April, and more will in July 2012; and many hospitals are considering ACO participation starting in January 2013. In an ACO environment, any reduction in utilization and costs directly benefits the provider.

- **The more HIE data acquisition is automated and integrated into physicians’ workflow, the more frequently the data are used.** In our cases, when physicians had to go online to get HIE data, the data were used for 6.8 percent of patients; when others went online to get the data for the physicians, the use rate doubled; and when the entire process was fully automated, data availability was universal.

- **If your hospital is planning to participate in either an HIE or an ACO, strongly consider using HIE data in the emergency department.**

- **Evaluate your local ED payer mix** to determine the impact of reduced utilization on hospital revenues under current payment mechanisms, and **model the financial impact under future payment models** (e.g., accountable care).

- **Design the technology and processes for ED HIE use** to **fully automate data acquisition and insertion into the patient’s chart**; ideally these data would be integrated into the EMR for access by ED physicians.

- **Set up a monitoring mechanism** to measure the clinical and financial impacts of ED HIE data use; use the data from this mechanism to refine the technology and process for data acquisition and use.