

A Successful Legal and Technical Infrastructure for Creating a True Communitywide Clinical Information System

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Although some health care organizations are beginning to achieve success providing clinical information for patient care using an electronic medical record, no one has achieved much success in providing clinical information outside of an organization. Community Health Information Networks attempted to provide information across organizations, but even the most successful managed to share only some eligibility and financial data. These efforts failed less for technical and more for organizational reasons.

There were a number of challenges to overcome in creating the Indianapolis Network for Patient Care (INPC)¹. In a pilot study, we demonstrated cost savings in emergency department (ED) visits as a result of one-way sharing of information from one of the participants to two of the participants².

Today the INPC is a fully functional, Web-based system for sharing data among the majority of acute-care hospitals in Indianapolis. The participants are Clarian Health (three hospitals), Community Hospitals (three hospitals), St. Francis Hospitals (two hospitals), St. Vincent's Hospitals (two hospitals), and Wishard Memorial Hospital (one hospital). These hospitals account for more than 95 percent of the hospital beds and ED visits in Indianapolis, a city of more than 1 million people.

Each participant in the INPC contributes encounter data, including ED visits, inpatient admissions, and a standard set of laboratory data. Some participants make additional data available as well, such as radiographic reports and images, electrocardiogram discharge summaries,

medication information, and vital signs. Much of these data are received as HL7 messages, but considerable preprocessing is required to standardize the way HL7 is used and to normalize representations of various results such as microbiology and blood bank.

The data are stored using the Regenstrief Medical Record System software, which runs on a cluster of Compaq Alpha computers that act as servers for the database. The system can print reports when it receives a trigger event such as an ED registration. Providers can also retrieve data using a browser-based viewer. We had to develop display methods that allowed providers reviewing the data to determine which hospital the information came from.

Several elements were critical in creating the INPC: the participation agreement, the management committee, and the data model. In addition, the Regenstrief Institute for Health Care, which organized this project, is a “neutral, third party” rather than being another health care organization.

The participation agreement is a contract—among all of the participants—that defines the basic rules under which we could develop the INPC. It contains a number of provisions, including the required content of the patient consent—which all participants use—and the initial data all participants would contribute. In addition, the agreement provides for a financial penalty for withdrawal that is large enough to prevent casual decisions.

The management committee includes two voting members from each organization.

Since the ED was the initial clinical focus of the INPC, one of these members is a clinical representative from that area. The other member is usually the Chief Information Officer. The committee meets quarterly to review progress and discuss upcoming developments. Committee members serve as administrative liaisons to their organizations and points of contact for problems or issues. When we encountered a difficulty, we often called on management committee members to work inside their organizations to overcome the difficulty.

Finally, the technical infrastructure facilitated participation by compartmentalizing each participant's data. When the INPC system receives data, it converts them to standard codes and formats using a common clinical data dictionary, but each participant's data are stored in their own database. We use the term "vault" to describe these databases because the data are locked up in them until access is enabled by some agreed-on trigger, such as an ED visit. The registration data from the participant are also matched against registration data from other participants to create a "global patient index." This index allows us to determine which registration records are likely to represent the same individual. This matching happens within an organization as well as among participants. The software matches doctor identifiers in a similar fashion.

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