The Regenstrief Medical Record System 1999:
Sharing Data Between Hospitals

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The Regenstrief Medical Record System (RMRS) continues to grow in depth and breadth. At Clarian and Wishard, over 200 million coded observations are stored along with 3.25 million text reports, 212,000 images (mostly radiographs) and 13.8 million orders for 1.55 million registered patients. Additional data are being incorporated on an ongoing basis including echocardiographic digital images, cardiac stress test results, and conventional radiographic images. The system links all of the large hospitals in Indianapolis (5 hospital systems and 9 emergency rooms), 13 homeless care sites, 44 clinics/offices in Indianapolis, and the county and state health departments.

The RMRS is used most extensively at Wishard Health Services and Clarian Health Partners. We are also well along the way to storing selected patient demographics, laboratory test results, emergency department encounter data and inpatient admission data from five different hospital systems. Each hospital's data is stored in a separate “vault” which is controlled by the contributing hospital. We are mapping the lab test codes from the five collaborating hospital systems to LOINC codes, so that they can be displayed in a common flowsheet. We have also developed new approaches to accommodate HL7 messages our multiple institutional environments and to ensure appropriate routing of data. We modified the RMRS patient selection and reporting functions to merge data from multiple hospital vaults to create single integrated displays either in reports or on-line. In order to integrate data in this way, we have created a master patient index based on a passive matching strategy that links patient records in different registries. With the patient's consent, all of this patient information is accessible for patient care (one visit at a time) via Web browser over a private network. We use SSL to encrypt data on the network, confidential passwords, a "need to know" strategy, access logging, administrative sanctions and electronic signatures to provide user level security.

We continue to enhance the functionality of our Web browser interface by improving the display format and speed and by adopting DHTML, tab control of pages, and collapsing tables for choice lists. The users can link from a coded radiograph impression in a flowsheet to the radiologists report, then to the original image, and then return to the flowsheet display. These images can be displayed in 1-2 seconds and are of very good quality. We now store all of the CT's, MRI's, and CR radiographs as JPEG compressed images locally on RMRS. This linking mechanism also allows data which is recorded as coded results in a visit note to be linked to the full visit note.

The Medical Gopher continues to support inpatient and outpatient services. Physicians use the Gopher for all inpatient and ED care at Wishard Hospital and for a majority of patient care in the IU Medical Group Primary Care group's practices. We have developed smooth interfaces between Dragon systems voice to text systems and the Medical Gopher. This is being used on a pilot basis.

Physicians use the workstation to record problems, follow-up information, consults, patient instructions and special letters. Automated rules and guidelines can be executed at any point in the order/note writing workflow, and can produce reminders, pre-canned orders, tailored menus and printed reports. Most Gopher workstations are fixed PCs, but we increasingly use notebook PCs and handheld PCs linked by spread spectrum radio frequency networks.

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