

Project Title:	Surveillance for Adverse Drug Events in Ambulatory Pediatrics
Principal Investigator:	Kilbridge, Peter, M.D.
Organization:	Washington University
Mechanism:	RFA: HS07-002: Ambulatory and Safety Quality Program: Enabling Quality Measurement through Health IT (EQM)
Grant Number:	R18 HS 017010
Project Period:	09/07 – 08/09
AHRQ Funding Amount:	\$992,600
Summary Status as of:	December 2008

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.

Business Goal: Knowledge Creation

Summary: This project was initiated in September 2007 and has completed the first half of the grant period. This project is using automated surveillance to reliably measure the incidence of adverse drug events (ADEs), or harm to patients from drugs, suffered by children with sickle cell disease, cystic fibrosis, and cancer that occur in the outpatient setting, in the emergency department, or during the transitions of hospital admission and discharge. This automated surveillance system has been implemented and outcomes are being monitored. The project will analyze data generated from BJC Health Care System, which includes St. Louis Children’s Hospital (SLCH). The SLCH Emergency Department (ED) uses Wellsoft ED computer system and the McKesson Corporation’s Certification Commission for Healthcare Information Technology (CCHIT) certified Horizon Expert Documentation version 7.6 SP2 for inpatient care. The BJC Medical Informatics Laboratory group is using its computer system and an expert systems architecture or natural language processing (NLP) based on the open-source cancer Text Informatics Extraction System (caTIES) version 2.3 to automatically scan laboratory, pharmacy, demographic, documentation, and diagnostic code data from the target populations for “signals,” or data combinations that suggest the occurrence of an ADE. The NLP is being evaluated for efficiency (positive predictive value and time/resource efficiency) and effectiveness in ADE detection compared with targeted explicit chart review, and the project will examine the impact of access to ADE metrics by practitioners. The data from the system will be used to improve medication use safety in clinic, emergency, and inpatient environments.

Specific Aims

- Implement an automated surveillance system for measuring the incidence of ADEs occurring in the outpatient setting (including the emergency department) in pediatric patients with specific chronic diseases that result in the need for emergency department care or admission to the SLCH. **(Achieved)**
- Use the automated surveillance system for measuring the incidence of ADEs occurring in these patient populations during the transition in care from outpatient to inpatient setting, e.g., originating during the admission process. **(Ongoing)**
- Use the automated surveillance system for measuring the incidence of ADEs in the target pediatric populations within four weeks of discharge. **(Ongoing)**
- Evaluate the performance of the event detection system as employed in the three aims listed above. **(Ongoing)**

2008 Activities: The project is analyzing both discrete data, such as lab values, and written test reports. The collection of data from the automated system for the discrete data rule alerts began at the start of 2008 and is ongoing. The Web interfaces and signal reports are now produced daily in real time for the evaluation of alerts by a physician and a pharmacist. Since early fall 2008, the project has been operating the enhanced surveillance system, which incorporates NLP for document review. The project now receives documents from the clinical data repository, which are being parsed. The project team has worked diligently to overcome challenges including reducing the number of administrative documents received, working out memory problems with caTIES, and fine-tuning document preparation for the NLP.

Preliminary Impact and Findings: A preliminary analysis of pediatric automated ADE application data from January and February of 2008 showed a positive predictive value of 13 percent, discovering 4 events with harm per 1,000 inpatient days. Actual data is being prepared for publication, but the project reported that ADEs have been identified in the population from alerts generated by both discrete rules and NLP rules. The success of the ADE surveillance system in the first 6 months of the project has prompted implementation of a BJC Health Care System-wide ADE surveillance program for all 12 of the BJC hospitals, focused on rules more typically used in adult hospitals.

Selected Outputs

Two abstracts were submitted and accepted for presentation at the November 2008 American Medical Informatics Association (AMIA) conference.

Grantee's Most Recent Self-Reported Quarterly Status: The project is somewhat under spent by 5 to 20 percent due to difficulty acquiring a qualified project manager. The project carried over much of the balance from Year 1 to augment the budget for natural language processing, which was necessary due to the loss of the original vendor and the need to reform the database to accept the caTIES output.

Milestones: Progress is completely on track.

Budget: Somewhat under spent, approximately 5 to 20 percent.