

Using Electronic Data to Improve Care of Patients With Known or Suspected Cancer

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Organization:	Baylor College of Medicine
Mechanism:	RFA: HS08-002: Ambulatory Safety and Quality Program: Improving Management of Individuals with Complex Healthcare Needs Through Health Information Technology (MCP)
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Summary Status as of:	December 2010

Target Population: Adults, Cancer: Colon, Lung, and Prostate, Veterans

Summary: Patients with known or suspected cancers transition through several ambulatory care settings to receive timely diagnosis and treatment. The survival benefit conferred by early diagnosis and treatment depends on well-coordinated care. This project tests the use of health information technology (IT) to identify patients where the diagnosis of specific cancers (prostate, lung, and colon) has been delayed. The project develops, tests, and refines queries to mine a clinical data warehouse for triggers that might signal diagnosis delays using data from the Veterans Administration's (VA's) electronic health record (EHR), the Computerized Patient Record System (CPRS) and Veterans Health Information Systems and Technology Architecture (VistA); and EMRx, the Scott and White Health system's EHR. Providers in the intervention group of the upcoming randomized, controlled trial (RCT) will receive electronic communication and surveillance if potential delays in their patients' diagnostic work-up are identified by the triggers. Outcome measures, obtained through chart reviews, consist of time intervals between several key steps in the optimal pathway of diagnosis.

Specific Aims:

- Identify patients with cancer-related diagnostic delays using trigger-based data mining of an EHR repository. **(Ongoing)**
- Determine the effectiveness of a health IT-based intervention to facilitate cancer diagnosis as compared with usual care. **(Upcoming)**

2010 Activities: During 2010, Dr. Singh and his team finalized the development of the colon cancer triggers. This process included a medical chart review of 180 charts at both the VA and non-VA sites to validate the triggers to determine whether the identified patients were truly at risk for delayed colon cancer diagnosis. Analysis of the data is ongoing and the preliminary results have been accepted as an oral presentation at the 2011 VA Health Services Research and Development Service Annual Meeting in Washington, D.C.

The team also applied the framework for developing colon cancer triggers to create triggers to identify those at risk for delayed lung and prostate cancer diagnosis. The framework is comprised of three steps to guide the design and development of electronic triggers that identify potential and actual delays in

diagnosis using data from integrated EHRs. The framework involves: mapping all followup events expected to occur in response to a particular diagnostic clue; verifying the trigger's logic as it is developed (e.g. anemia not followed by colonoscopy in a defined time period); and providing continuous and iterative feedback to improve the trigger.

Each trigger required mining more than 200,000 medical records over a 6-month period. A team composed of clinical providers and a programmer met weekly to define the appropriate clinical criteria and determine how to best implement them, taking into account the limitations of the health information systems at the sites. Each trigger is composed of several clinical rules (e.g. criteria). Each rule required multiple record review sessions, during which providers tested the triggers by identifying the documented clinical evidence that supported or contradicted the triggers' rules.

By the end of 2010, the triggers for prostate cancer were developed; validation at both the VA and non-VA sites is underway. The development of the lung cancer triggers are close to completion and data validation will start in early 2011. In parallel, the team is awaiting final Institutional Review Board approval at both sites for testing the interventions in a RCT, scheduled to begin in March 2011.

Grantee's Most Recent Self-Reported Quarterly Status (as of December 2010): Project progress is on track in some respects, but not others and budgeted funds are somewhat underspent. The initial deadline was not met due to delays in 2009. This included the announcement of a new national VA policy on developing data repositories for research purposes which delayed the creation of the data warehouse for this project at the VA. In addition, the development of the colon cancer trigger took more time than anticipated. However, the experience and knowledge gained informed and expedited the development of the triggers for prostate and lung in 2010 and the team does not anticipate any other significant delays.

Preliminary Impact and Findings: Dr. Singh and his team conducted a pilot to test the colon cancer triggers and assess if the patients identified were truly at risk. They found that of the 89,187 patients to whom the trigger was applied, 595 patients were identified as at risk. Of the 120 patient charts reviewed, 90 (75 percent) were true trigger positives. This observation indicates EHR-based trigger methods are potentially useful to detect potential delays in colorectal cancer diagnosis.

Strategic Goal: Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions in care settings, and the use of electronic exchange of health information to improve quality of care.

Business Goal: Implementation and Use