

Standardization and Automatic Extraction of Quality Measures in an Ambulatory Electronic Medical Record

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Target Population: Not Applicable

Summary: The Physician Quality Reporting Initiative (PQRI) is a pay-for-reporting program administered by the Centers for Medicare and Medicaid Services. The program offers incentive payments to eligible professionals who satisfactorily report on quality measures for covered professional services provided to Medicare beneficiaries. For small and solo physician practices, use of an expert third party enhances their ability to extract, analyze, and report on quality data, such as for the PQRI. Automated data extraction should require less staff and physician time, increase accuracy, enhance the usability of the data, and improve timeliness of reporting quality measures both to outside agencies and for use within the practice.

Citizens Memorial Hospital (CMH) sought to build quality measures into an ambulatory electronic medical record (EMR) system, to implement an automated system for data extraction of quality measures, and to compare the completeness and accuracy of quality measure code assignment of manual coding with automated coding. The study was conducted in 15 physician practices that were already utilizing an ambulatory EMR. The ambulatory EMR record is linked to a community wide EMR (Project Infocare), where patient visits from ambulatory, inpatient, home care, and long term care settings are combined into one patient-centric view. Care information is maintained electronically; no paper medical records are created or maintained in these practices.

Phase I of the project, from October 2007 through September 2008, consisted of standardizing the documentation systems and processes within the CMH ambulatory EMR so that data required for quality measurement would be available as extractable data elements without compromising physician productivity. Standardization covered provider documentation templates, electronic prescribing, and documentation of allergies. During this phase, CMH established and implemented a claims-coding method to report to PQRI for comparison.

Phase II of the project, from October 2008 through December 2009, focused on mapping, extracting, normalizing, updating, reporting on, and preparing the PQRI measures for ambulatory care for export using an automated data extraction tool. During the comparison period, October 2008 through February 2009, providers and coders utilized the claims-coding method for a set of PQRI quality measures. Automated data extraction was also done for comparison.

Sixty-two quality measures were built into the documentation and workflow in the 15 clinics studied. Automated coding was significantly more complete and accurate than manual coding for the quality measures examined. The process of building quality measures for automated data extraction relied heavily on the use of custom documentation queries. A toolkit containing these custom queries was expanded, refined, and distributed to 53 organizations representing 2,720 health care providers for use in their EMR systems by the EMR vendor. This project establishes the standardization efforts necessary for data capture of 62 of the PQRI quality measures in the EMR system. It also demonstrated the efficiency and accuracy of using a data extraction and reporting expert to perform quality measurement.

Specific Aims:

- Establish the standardization necessary for data capture of quality measures in an ambulatory EMR system. **(Achieved)**
- Standardize and integrate data capture for quality of care evaluation into the routine documentation of care in an ambulatory EMR. **(Achieved)**
- Implement an automated system for data extraction of quality measures in the ambulatory setting, including valid, reliable reports that provide actionable insight for the measurement and analysis of care. **(Achieved)**
- Demonstrate the efficiency and accuracy of using data extraction and reporting to perform quality measurement in the ambulatory care setting. **(Achieved)**
- Address technical, organizational culture, and workflow issues associated with quality data capture. **(Achieved)**

2009 Activities: CMH updated the PQRI measures to be extracted from the system to include the 2009 PQRI measure changes. The new measures were added to the system for each of the appropriate primary care and specialty documentation templates. CMH also retired eight expired measures.

Grantee's Most Recent Self-Reported Quarterly Status (as of August 2009): The project was completed with all major aims achieved.

Impact and Findings: While only 52 percent of the overall U.S. providers who reported to PQRI successfully reported on three quality measures in 2009, CMH and Institute for Health Metrics (IHM) were able to extract and report on 62 measures. Automated data extraction was more complete than coders at identifying eligible populations and more accurate in reporting the quality measure results as recorded in data fields. This result is qualified by a low compliance rate for manual claims coding of the quality measures. CMH and IHM were able to achieve 100 percent coding completeness using automatic data extraction; however, automated data extraction relied heavily on the use of custom documentation queries. One half of the 62 measures required a custom query for accurate quality measurement. Eleven of 12 additional eligibility requirements required a query, and all quality measure exclusions required queries.

Coders were unable to manually code all charts for the 62 quality measures within the PQRI program that applies to CMH provider specialties, even with additional coding staff. To limit the scope of coding required, coders were instructed to code for three measures for each provider. Those measures were used for comparison to the automated data extraction method. Coders were unable to accurately track the additional time associated with coding for PQRI in a detailed manner.

CMH coder compliance using manual coding methods was extremely low. Coders had no direct incentive to add the quality measures codes to these cases; even though additional time was budgeted and allowed for this

additional coding. Providers were also not provided with a financial incentive to assure that the PQRI codes were applied consistently. By design, no feedback was provided to the coders on their level of completeness during the study period. Feedback to providers was also not available until the automated data extraction reports were created and validated.

Automated data extraction relied heavily on documentation queries or data fields for additional requirements, results, and measure exclusions. Without incentives and feedback, providers may not use the documentation queries that are needed for accurate quality measurement. Without provider use of those queries, quality measurement can be done but may not be reflective of the care provided. Modifications and further standardization of the measures could improve use and measurement.

Use of quality measures that require new documentation queries has, so far, been low among providers at CMH. EMR documentation to capture all PQRI data elements was implemented during this project. However, so far provider documentation of PQRI data elements has been low, especially for documenting measure exclusions. As intended, no feedback was given to providers on their use of the documentation queries or on their performance on the quality measures during this study. Strategies to improve use of the quality measurement queries may include feedback, workflow enhancements, and training.

Data extraction services, which are not registries according to current definition, might be considered as another strategy for reporting PQRI data. A repository of quality measure documentation queries and data fields (exclusions, additional requirements, and evidence-based assessments) would be helpful to vendors and ambulatory providers, particularly if the queries and fields are updated as the quality measures evolve. Future studies are indicated on the use of quality measure queries, data fields, and assessments within an EMR system. Targeted feedback, workflow enhancement, and training are methods to be considered for further research.

More detail on the project findings is included in Ms. McColm's final report: [McColm 2009 Final Report](#).

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: Implementation and Use