Automated method to identify patients eligible for quality measures using an EHR: Feasibility and accuracy

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Background

The US National Quality Forum (NQF) identifies and endorses measures that evaluate patient outcomes of healthcare. One family of NQF measures addresses whether patients using medications for which annual laboratory monitoring is recommended receive such monitoring. Identifying eligible patients by manually probing an electronic health record (EHR) is time consuming. We hypothesized that an automatic query would perform as well as manual reviewers in identifying eligible patients.

Methods

We developed a machine query of the EHR at Baltimore Medical Systems (Maryland, USA) of patients eligible for the quality measures. Patients prescribed one or more of the target medications in the previous calendar year were included if they were 18 years or older, had received at least a 180 day supply of the medication, and had not been hospitalized in the preceding year.

Two hundred patients who were prescribed index medications (angiotensin converting enzyme inhibitors, digoxin, statins, or diuretics) were randomly selected. Eligibility for the quality measures (respective denominators) was determined by 2 methods; Automatically by the query and Manually by two BMS employees who probed the EHR. Discrepancies between manual reviewers and the electronic query were analyzed by a third reviewer who was knowledgeable of the dispute and adjudicated (gold standard).

Results

The query dramatically outperformed manual reviewers compared to the gold standard (Table). Deficits of the query identified by the gold standard review resulted in query modifications subsequently resulting in 100% concordance with the gold standard.

Table 1-Electronic query vs. manual review

	Electronic Query	**Manual Review**
Negative Predictive Value	99.4%	89.2%
Positive Predictive Value	96.9%	80.0%
Sensitivity	96.9%	37.5%
Specificity	99.4%	98.2%

Conclusion

Automatic queries of EHRs to identify patients eligible for quality measures are feasible, more efficient, more sustainable and potentially far superior to manual reviews of EHR data. Complex eligibility rules for quality measures may limit the usefulness of human EHR reviewers.