

Project Title: Using IT to Improve the Quality of Cardiovascular Disease Prevention and Management

Principal Investigator: Williams, Andrew, Ph.D.

Organization: Kaiser Foundation Research Institute

Mechanism: RFA: HS07-002: Ambulatory and Safety Quality Program: Enabling Quality Measurement through Health Information Technology (EQM)

Grant Number: R18 HS 017016

Project Period: 11/07 – 06/10

AHRQ Funding Amount: \$605,862

Summary Status as of: December 2009

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

Business Goal: Knowledge Creation

Target Population: Adults, Chronic Care*, Heart Disease

Summary: Electronic medical records (EMRs) have the potential to determine the actual relationship between patterns of preventive and disease management care, and the occurrence of disease events that this care is designed to prevent. However, new approaches are needed to realize this potential. This project will refine and test a method that can quickly, and at reasonable cost, generate actionable information about practice variation relative to evidence-based guidelines and estimate its association with variation in health outcomes and health care utilization. This information could profoundly impact the quality of health care by providing a means to evaluate the effectiveness and costs of alternative approaches to care and by characterizing patient-, physician-, and system-level units that should be targeted to determine the causes of unusually low or high performance.

This project is using Epic's Certification Commission for Health Information Technology-certified EMR system (HealthConnect) in two large health care systems to test and refine a method for determining the actual relationship between patterns of preventive and disease management care of cardiovascular disease (CVD). The preventive and disease management services that are being analyzed include: blood pressure management, tobacco counseling, weight/nutrition counseling, and blood pressure screening. The primary unit of interest is the Primary Care Physician (PCP). The indices for the panel-year of each PCP will be rolled up from scores calculated on the service-eligible patients in their panel each year. The data to calculate these individual patient level for each year are being calculated at the using longitudinal (up to 10-year) datasets from Kaiser Permanente Hawaii and Kaiser Permanente Portland. Using a person-time methodology that evaluates adherence to prevention and selected CVD management guidelines, this project will calculate PCP-level indices (a prevention index [PI] or a disease management index [DMI]) for CVD prevention and preventive management of patients with hypertension, hyperlipidemia, diabetes, congestive heart failure, and past myocardial infarction. We will then determine the relationship between adherence to care guidelines and subsequent CVD morbidity and mortality in propensity score adjusted multi-level regression models. Patients without diabetes, hypertension, hyperlipidemia, and prior CVD are being examined separately for preventive services. Patients with prior CVD and related diagnoses are being examined for both preventive and management guidelines adherence. These data will clarify the relationship between PCP's adherence to evidence-based guidelines and outcomes.

Specific Aims

- Identify practice-level primary care variations in preventive care, weight management, and selected chronic disease management, including drug prescription patterns aimed at reducing CVD morbidity. **(Ongoing)**
- Determine the associations of quality of preventive care and disease management practices to morbidity, mortality, and costs of care. **(Ongoing)**
- Improve delivery of care. **(Ongoing)**

2009 Activities: Six of the eight expected data specification templates were completed, and data extraction and data analysis became the major focus of activities during this period for the targeted services. Originally, the research team anticipated including 10 services in the project; however, given the intensity of the work this was reduced to eight. The project added a second health system so that cross-comparable data could be used to validate findings and explore and resolve difficulties in pooling data.

Collaborations and partnerships were explored with several entities. Conference calls were held with the National Committee for Quality Assurance to gauge their interest in applying the research methodology. Dialogue was established with the Hawaii Optimizer Project, a demonstration project to test the David Eddy Archimedes algorithms in setting patient priorities. Through the National Resource Center support provided by the Agency for Healthcare Research and Quality, the team established a dialogue with investigators at the University of Pennsylvania to discuss development of some cross-project papers on quality management.

Preliminary Impact and Findings: Preliminary results of the blood pressure screening and management and tobacco management services have been reviewed. For systolic blood pressure management, clinical practices in the top tertile of performance as measured by the DMI had 15 percent fewer strokes and 20 percent fewer hospital days during a 10-year observation period compared to the bottom tertile. Diastolic performance, however, varies in the opposite direction, but to a lesser degree. This finding appears to be related to the much higher levels of diastolic than systolic blood pressure management scores during the 10-year observation period. During that period, diastolic management exceeded 90 (on a scale of 0 to 100) in all years, while systolic management began in the mid-40s and rose gradually into the 90s by 2005. As mean scores reached their highest levels, the association between the quality index and outcome faded as maximal gain from management was achieved, and even reversed, probably because the sickest patients end up in the care of physicians who focus most heavily on blood pressure control. In preliminary tobacco reports, there is a similar pattern—those clinicians most likely to counsel patients to quit smoking have higher patient rates of CVD. These unadjusted analyses are confounded by the tendency of physicians who specialize in CVD and pulmonary disease to more aggressively manage tobacco smoking. Multivariate analyses currently underway will adjust for this using propensity variable analyses.

Selected Outputs

Altonn H. Kaiser culls own data for insight. *The Honolulu Star-Bulletin*; 2008 Mar 19.

Blood Pressure Management Data Request Tool and Practice Survey Questionnaire designed to help inform the provision of feedback to managers on guidelines adherence at the practice, health care team, and system levels.

Grantee's Most Recent Self-Reported Quarterly Status (as of December 2009): The project has made considerable progress in completion of its aims and appears to be on track to completing all aspects on time. The number of services included in the research will be reduced from 10 to eight.

Milestones: Progress is mostly on track.

Budget: Spending roughly on target.

**AHRQ Priority Population.*