Use of Features in Electronic Health Records and Health Care Quality: How are They Related?

Eric G. Poon, MD, MPH1,2, Steven R. Simon, MD, MPH1,3,*, Chelsea A. Jenter, MPH2, Rainu Kaushal, MD, MPH2, Lynn A. Volk, MHS2, P.D. Cleary, PhD, Alexis Z. Tumolo2, David W. Bates, MD, MSc1,2

1Harvard Medical School, Boston, MA; 2Brigham and Women’s Hospital, Boston, MA; 3Harvard Pilgrim Health Care, Boston, MA;*Corresponding author

Introduction
Limited evidence supports the widely-held belief that the deployment of electronic health records (EHR) improves quality of care. Even less is known about how the various features of the EHR impact quality indicators. We therefore used a cross-sectional design to study whether the use of EHR features was associated with improved quality in the community setting.

Methods
To study the relationships between the use of EHR features and quality, we combined data from two sources. EHR use was assessed in a written survey conducted in the state of Massachusetts in early 2005. The survey assessed whether the physician had an EHR and, if so, when it was installed. It also assessed whether the physician’s EHR (if installed) provided the following key functions: on-line laboratory results review, on-line radiology result review, care reminders, problem list and medication list. The survey further assessed whether the physician used each of these features “most or all of the time”. The quality of care delivered by each physician in 2004 was assessed using administrative data supplied by the 5 major health plans in Massachusetts in the areas of diabetes, women’s health, cardiovascular disease, depression, colorectal cancer screening, well child visits, and asthma. To study the relationships between the use of EHR features and quality, we built logistical regression models to assess whether self-reported use of each relevant key EHR feature was associated with the physician scoring in the top quartile for each quality area. Models adjusted for practice size and volume, physician age and gender, self-reported presence of active quality improvement activities, and clustering at the medical group level.

Results
We administered the survey to 1884 primary care physicians (PCPs) and specialists, of whom 1345 responded (response rate = 71%). Of the survey respondents, we were able to obtain quality data on 509 PCPs. A subset of our regression analyses are summarized in figure 1. The results indicate that consistent use of key EHR features was significantly associated with the physician scoring in the top quartile for each quality area. Models adjusted for practice size and volume, physician age and gender, self-reported presence of active quality improvement activities, and clustering at the medical group level.

Conclusions
The use of key EHR features is associated with higher performance in some, but not all areas of quality. Our results suggest that deployment of EHR is an important building block for improving quality, but does not necessarily result in higher quality. Other factors, such as the quality of decision support in the EHR and whether the EHR is effectively used to support the chronic care team may be important determinants of quality.