Understanding Medical Providers’ Information Management Strategies

Lori Polzin, BS, MBA\(^1\); Erin Long, BS\(^1\), Kelsey Schultz, BS, MS\(^2\), Sara Engler, BS\(^2\), Robert Moritz, MA\(^1\), Po-Huang Chyou, PhD\(^2\), Amit Acharya, BDS, MS, PhD\(^2\)

\(^1\)Marshfield Clinic, Marshfield, WI; \(^2\)Marshfield Clinic Research Foundation, Marshfield WI

Abstract

Cognitive science methods have shown significant promise to meaningfully inform and formulate the design, development and assessment of clinical information systems and decision support technology. The objective of this project was to determine the cognitive thought process and information management strategies of providers in an ambulatory clinical setting as they prepare for a patient office visit.

Introduction

The current healthcare climate is in pursuit of systematic methodologies to achieve the triple aim of improving the patient care experience, improving the health of populations, and reducing per capita costs of health care [1]. The use of an electronic health record system is critical to achieving these goals. Unfortunately, ambulatory EHR systems of today are not organized in the way a physician thinks and works. The poor usability and organization of information in the system results in difficulties in obtaining an integrated, longitudinal view of patients’ health conditions as providers prepare for patient visits. Marshfield Clinic, a non-profit, regional healthcare organization in Wisconsin is in the process of a clinical information systems redesign project to meet the requirements of several initiatives such as Meaningful Use, Accountable Care, ICD10 integration and Patient Centered Medical Home. In order to redesign Marshfield Clinic’s ambulatory EHR, we set out to discover the cognitive and information management strategies of providers in an ambulatory clinical setting as they prepare for a patient office visit.

Methods

We conducted one-on-one interviews with over 60 providers within the Marshfield Clinic system to determine information needs prior to seeing a patient for an office visit. We grouped the information needs, identified during interviews, into categories of information. In the next phase, providers completed a survey ranking the importance of each information type and frequency of use in their practice on a five-point Likert scale. The survey was administered to all of the 60 providers originally interviewed. The percent of the highest ranking scores as well as the 95% confidence interval (CI) (upper limit and lower limit) for the responses under importance and frequency of each information categories were calculated. Providers were also asked to complete a card sorting exercise where they grouped the categories of information to better understand their use of organization principles.

Results

A total of 32 out of the 60 participants completed the survey for a response rate of 53%. Among 32 providers who finished the survey, 62% were male and 38% were female. The average age of the survey respondents was 51 years. Internal medicine and family medicine were the predominant specialties from which the providers participated. At least 50% of these providers indicated the following items were most important: history of present illness (95% CI 49-83%), symptoms (95% CI 44-79%), clinical note (95% CI 39-75%), reason for visit (95% CI 39-75%), patient treatment plan (95% CI 38-74%), assessment (95% CI 33-70), and medications (95% CI 33-70%). A total of 17 out of the 60 participants completed the card sorting activity for a response rate of 28%. A cluster analysis showed how data elements are grouped together based on likeness and the organizational principles among providers. For example, family history and social history group together and as that group builds out we could see how close or further away other history elements like past medical history and surgical procedural history were. Similarly, other elements like lab results, radiology images/reports and other specialized tests/procedures also group together. The value of these groupings will help show and uncover the relationships that exist between data elements so that we can use that information to validate user interface design decisions with the physicians.

Conclusion

The resultant information could be used to facilitate a proof of concept design around the framework, display and interaction with clinical information in the EHR to support providers’ efforts in obtaining a complete picture of the patient’s health conditions as they prepare for a patient visit.

Reference