Conversational Information Technology for Better, Safer Pediatric Primary Care

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Summary: This project developed and evaluated an automated telephony system as part of prevention services delivered in an urban pediatric practice. The system gathers personal health data and counsels parents before scheduled visits, integrates the data with the physician’s electronic health record (EHR), and offers personalized followup assessment and counseling. The internally developed interactive voice response (IVR) telephony system interfaces with the providers’ EHR. The telephony system, called the Personal Health Partner (PHP), uses fully automated, interactive conversations (including synthetic speech and speech recognition) to gather health data and counsel parents before scheduled pediatric primary care visits. Parent-entered data are shared with the child’s primary care provider (PCP) via the EHR, where data are reviewed and clinician decision support is provided.

The system was evaluated via a three-armed randomized controlled trial (PHP only, PHP assessment with counseling, or usual care groups) to determine the marginal effect of the PHP intervention on comprehensive preventive and medication management assessments during PCP visits; preventive and medication management counseling; healthier parental behaviors; and increased parental activation.

Specific Aims:

- Develop an automated telephony system that uses fully automated conversations to perform pre-visit pediatric primary care assessments, offer parental counseling (including appropriate medication use), and support clinician decisionmaking by incorporating the PHP child assessments into their EHR at the point-of-care. (Achieved)

- Conduct a randomized clinical trial to determine: 1) whether PHP assessment alone (no counseling) with EHR data exchange leads to higher quality preventive care and medication management; and 2) whether the addition of PHP counseling to PHP child assessments (before and after visits) is associated with increased quality and healthier parental behaviors. (Achieved)

2011 Activities: Recruitment for the trial, which began in April 2009, continued through February 2011. Children aged 4 months to 11 years who were primary care patients at Boston Medical Center were eligible for the study. All patients with a primary care visit between June 2009 and February 2011 were invited to participate via a mailed brochure that provided information about participation in the study and how to call the PHP system. A data exchange was developed and implemented for the PHP telephony system and the EHR, and the hospital’s clinical data warehouse was set up to deliver appointment and medication data into the team’s SQL server database. The content of the PHP system includes three
general areas: routine health care maintenance (RHCM), asthma symptom assessment, and medication safety. RHCM areas include: 1) general health supervision; 2) developmental screening; 3) diet and physical activity; 4) tuberculosis risk assessment; 5) smoking risk assessment; and 6) maternal depression screening. Participants were randomized into PHP only (n=74), PHP with counseling (n=290), and usual care (n=185). Once families began to use PHP successfully, providers were able to access this information in the EHR, and determine whether to accept the information to prepopulate the visit documentation.

Full implementation of the study protocol included printing and mailing of brochures using the PHP Manager (a PowerBuilder application), outbound calling, full implementation of the PHP patient-centered system, data exchange between the PHP system and the EHR, and completion of followup surveys.

Primary outcome measures were designed to assess whether patients received the appropriate care for prevention, treatment, and management. Parent- and provider-reported feasibility and acceptability were assessed via questionnaires developed by the study group and focused on usability, perceived value and effectiveness, and recommendation to others. Parent activation was assessed using a modified version of the 13-question Patient Activation Measure instrument. The instrument was modified to reflect activation from the point of view of a parent. Parental health literacy was assessed using the Rapid Estimate of Adult Literacy in Medicine, a valid test of word pronunciation that correlates with tests that evaluate a range of literacy skills.

As last self-reported in the AHRQ Research Reporting System, some project activities were on track while others were not, and project spending was on track. However, using a 1-year no-cost extension period, the team was able to extend the subject recruitment period and achieve all study aims. This project ended in August 2011.

**Impact and Findings:** PHP was able to identify and counsel in multiple areas. PHP parents were more likely to report discussing important issues such as depression and prescription medication use with their clinicians during visits. PHP parents were also more likely to report being better prepared for visits. Most PHP parents (89 percent) would recommend use of PHP to other parents. Use of a patient-centered IVR system such as PHP before routine health care maintenance visits can facilitate more comprehensive information at visits, identifying and counseling parents who have important issues, and better preparing parents and clinicians for visits. Systems like PHP have the potential to improve health-related behaviors, detect patient safety situations, and enhance patients’ experience and engagement in primary care settings.

**Target Population:** Medically Underserved, Pediatric*

**Strategic Goal:** Develop and disseminate health IT evidence and evidence-based tools to support patient-centered care, the coordination of care across transitions in care settings, and the use of electronic exchange of health information to improve quality of care.

**Business Goal:** Implementation and Use

*This target population is one of AHRQ’s priority populations.*