

## Personal Health Records and Elder Medication Use Quality

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<b>Organization:</b>	University of Iowa
<b>Mechanism:</b>	RFA: HS07-007: Ambulatory Safety and Quality Program: Enabling Patient-Centered Care through Health Information Technology (PCC)
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**Summary:** The Medicare Modernization Act (MMA) of 2003 required health plans to provide medication therapy management (MTM) services to optimize therapeutic outcomes among high-risk patients with multiple chronic conditions taking multiple medications. Because the MMA did not dictate how health plans should deliver MTM, various delivery methods exist. Regardless of delivery method, a model of patient-centered MTM requires that the patient play a pivotal role in self-monitoring, self-evaluation, goal setting, and medication taking. This project evaluated the ability of a personal health record (PHR) to support and improve elderly patients' medication adherence, use, and management. The project team tested the hypotheses that: 1) a successfully maintained PHR reinforces self-efficacy for MTM; 2) an up-to-date PHR increases patient knowledge about medications; and 3) PHR-gained information allows patients to shift their beliefs about medication from concern to understanding.

Phase I of the project consisted of a series of patient, caregiver, and provider focus groups aimed at identifying patient and physician medication management practices, barriers to PHR use, and physician office workflow issues. Upon evaluating the feedback received during these sessions, the project team identified patients' and providers' wants and needs for the varied functionalities of PHR products, and developed a formal measure of the patients' role in maintaining their health. The team also conducted an environmental scan of commercially available PHR products to identify existing core PHR functions available to elderly patients.

Phases II and III of the project were hands-on trials of patients' interaction with a commercially available PHR. The team tested the PHR by measuring elderly patients' interaction with the technology and their resulting self-activation with respect to medication management. Phase II involved a usability study of the PHR via a human-computer interaction (HCI) laboratory assessment of elderly adults to identify the challenges patients face when using the PHR and the support needed to facilitate usage. After usability testing, it was determined that the commercially available PHR was not well-suited to medication management activities. A new PHR using participatory design methodologies was developed. Subsequently, in Phase III, a randomized controlled trial was conducted comparing older adults using the new PHR with those not using the PHR to assess outcomes, patient-physician communication, and other technology utilization measures.

### Specific Aims:

- Develop measures of patient MTM behaviors and patient self-efficacy for MTM. **(Achieved)**
- Compare the patient-reported MTM behaviors, medication adherence, patient- and physician-

centric medication quality indicators, patient self-efficacy for MTM, and patient beliefs about medication among patients randomized to a current, representative PHR system versus patients randomized to usual care. **(Achieved)**

- Investigate the usability of the PHR system in an HCI interaction laboratory compared with alternative prototypes developed through participatory design with older adults of varying ability levels. Associate PHR performance with measures of cognitive, motor, and perceptual ability. **(Achieved)**

**2011 Activities:** Due to delays in the adaptation of the PHR user interface and tracking, the project team used a 1-year no-cost extension that allowed for continued work on this project in 2011. Baseline data was examined by generating frequency distributions and comparing study groups across select characteristics to assess any differences. Survey responses were coded to examine changes over time. Medication data collected at baseline were cleaned and coded using an online interface developed to facilitate this work, and a preliminary assessment of data was completed. The team examined the relationship between multiple chronic conditions and the use of a medication list, and the association of keeping a medication list and patient-provider interaction.

As last self-reported in the AHRQ Research Reporting System, project progress was mostly on track and project budget spending was on target. This project was completed in August 2011.

**Impact and Findings:** A total of 1,163 people were randomized into the trial; after attrition, 1,075 were included in the analyses. The mean age of the study participants was 72 years; 56.8 percent of participants were women. At baseline, the control group was more likely to have changed the strength or dose of a prescription medication in the past 3 months. At followup, the intervention group was less likely to have started an over-the-counter medication in the previous 3 months than was the control group (8.9 percent versus 13.2 percent), and to be taking two or more nonsteroidal anti-inflammatory drugs (14.1 percent versus 19.4 percent).

Thirty-eight-point-eight percent of the subjects never attempted to log on to the system during the study period. Of those who did, 5.7 percent did not complete the login process, and 4.1 percent completed login but performed no activity with the PHR. More than 40 percent of the intervention group entered at least one medication into the PHR, and the system displayed at least one medication warning message for nearly one-third of them. The most frequent PHR-generated medication warnings were for nonsteroidal anti-inflammatory drugs, angiotensin converting enzyme inhibitors, and acetaminophen.

After adjusting for baseline differences, PHR high-users reported significantly higher over-the-counter medication use at followup compared to PHR low-users and non-users. Significantly more high-users reported keeping a current medication list than did low- and non-users. High-users were also significantly more likely to report having had a side effect in the past 3 months, but they also were more likely to report that they know how to recognize side effects. Upon adjusting for pre-existing differences in the medical problems and number of medications, there was no difference between high-users and low- and non-users in number of medication management problems at followup. Physical health declined from baseline to followup in all user groups. There were no differences observed in health care utilization. Users did not differ in either physical or mental health.

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**Target Population:** Elderly\*, Medicare

**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 exchange of electronic health information to improve quality of care.

**Business Goal:** Implementation and Use

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