

## Virtual Patient Advocate to Reduce Ambulatory Adverse Drug Events

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<b>Organization:</b>	Boston Medical Center
<b>Mechanism:</b>	RFA: HS07-007: Ambulatory Safety and Quality Program: Enabling Patient-Centered Care (PCC) Through Health Information Technology
<b>Grant Number:</b>	R18 HS 017196
<b>Project Period:</b>	September 2007 – August 2011, Including No-Cost Extension
<b>AHRQ Funding Amount:</b>	\$1,180,772
<b>Summary Status as of:</b>	December 2010

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### Target Population: Adults

**Summary:** The transition period between hospitalization and the first post-hospitalization ambulatory visit has a high risk for medical errors. The objective of this project is to expand the use of an animated conversational agent to assist patients during this transition. In prior studies, the project team developed a paper-based tool, the After Hospital Care Plan (AHCP), to deliver the Re-Engineered Hospital Discharge, a set of recommended activities to be performed at the time of discharge. Subsequently, in order to make the AHCP electronically available, Dr. Jack and his team developed the Virtual Patient Advocate (VPA), a computerized, animated character that emulates the face-to-face conversational behavior of an empathic provider.

Following hospital discharge, patients have access to VPA via a Web portal, and are encouraged to use it before their first visit with their primary care physician (PCP). The VPA offers health education, advice on monitoring and self-care, and assessment of medication dosing and adherence. To meet the needs of an ambulatory environment, the team is modifying the content, logic, layout, workstation, AHCP, and training manual. The team is also developing links between the VPA system, Boston Medical Center's Certified Commission for Health Information Technology-certified GE Centricity electronic medical record (EMR), and the ambulatory providers' information technology (IT) systems, as well as conducting a series of qualitative evaluations with potential users and clinicians. Once the beta version of the VPA is sufficiently prepared, the team will pretest the system with potential users and clinicians, make modifications pursuant to findings, and conduct a randomized controlled trial (RCT) with subjects who are at high risk of adverse drug events. The system has now been completed, debugged, and tested with hospitalized patients. The RCT, a test-of-concept trial, began in August 2010. The outcome data will be collected after the first postdischarge appointment with the responsible clinician.

The participants in the randomized trial will be instructed to: 1) check in with the VPA via computer following discharge from the hospital and on a regular basis before the first post-hospital visit; 2) bring to the first postdischarge visit the result of the online interactions, which is a list of items to discuss with the clinician; and 3) meet with the VPA after the ambulatory visit for instructions on any medication regimen changes made during the office visit. The team will evaluate the intervention by comparing process outcomes (i.e., enrollment, adherence, attrition, fidelity, therapeutic alliance, and patient activation) and clinical outcomes (i.e., patient and provider satisfaction, patient knowledge of self-care and medications,

adverse events, and pharmacist interventions) of those using the VPA to outcomes for a usual care group. Concurrently, the team is pursuing dissemination of the VPA by introducing the system to other interested health care organizations.

### **Specific Aims:**

- Program the VPA, a computer-based, interactive, animated character, to offer patients with limited health literacy or health education advice on self-care and medication use during the transition from hospital to ambulatory care. **(Achieved)**
- Design and implement an ambulatory care plan using the VPA to educate the patient and respond to questions. **(Achieved)**
- Evaluate the intervention in the ambulatory setting. **(Ongoing)**
- Build a robust dissemination program that will introduce this system into a health care system that is a member of a national test bed. **(Achieved)**

**2010 Activities:** The intervention was launched after significant development, testing, and refinement of the VPA system. The study team continued testing the workstation to identify areas that needed improvement or additions. A variety of clinicians and patients reviewed the system and made recommendations about how the system should be modified. Additionally, testing for the VPA portal included assessment of how information flows from the patient to the clinical team and back to the patient. A codification system was designed to categorize alerts. Additional diagnosis scripts, diagnosis pages, medications, medication scripts, primary care providers, and pharmacies have been added to the existing selections. Integration of the workstation with the Boston Medical Center EMR was completed.

Following extensive testing, the research team began to recruit patients for the RCT. Due to delays with development, the length of time to run the RCT was truncated to 5.5 weeks. A total of 47 patients were randomized; 23 to the control group and 24 to the intervention group.

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**Grantee's Most Recent Self-Reported Quarterly Status (as of December 2010):** Project milestones and aims are mostly on track, while project spending is on target.

**Preliminary Impact and Findings:** The RCT was completed and data analysis is in progress. The study cohort was followed from discharge until the first appointment with their primary care provider, a time of approximately two weeks. Of these 47 randomized patients, four logged into the system. The four patients logged in an average of eight times each, to generate a total of 31 alerts. Fifty-five percent of alerts were related to a possible side effect. The grant team hypothesizes that patients may have only used the system if they were concerned about their health. Of the 47 users, 17 were re-hospitalized or had an emergency department visit. None of the four users were re-hospitalized or had an emergency room visit.

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**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