

## Improving Post-Hospital Transitions and Ambulatory Care for Children

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<b>Principal Investigator:</b>	Nkoy, Flory, M.D., M.S., M.P.H.
<b>Organization:</b>	University of Utah
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**Summary:** Asthma is the most common chronic illness in children and can have a significant impact on quality of life for both children and their families. Asthma is also the most frequent reason for preventable hospital and emergency department (ED) admissions among children in the United States. Children hospitalized for asthma are at increased risk for readmission for several reasons, including: 1) hospital provider's non-compliance with evidence-based asthma preventive measures at patient discharge; 2) poorly-managed care transitions from the hospital to the ambulatory setting; 3) failure of primary care providers (PCPs) to monitor and manage chronic asthma; 4) patient non-compliance with asthma home therapy; and 5) failure to establish ongoing monitoring of asthma chronic symptoms in the ambulatory setting. Preventing asthma-related hospitalization and ED use can improve quality of life and reduce health care-related costs among children with chronic asthma.

This project is developing and evaluating two applications of health information technology (IT) to improve care transitions from the hospital to the ambulatory and home settings for children with asthma. The first application, an asthma-specific Reminder and Decision Support (RADS) system, has been developed and implemented to help hospital providers accomplish the following at discharge: 1) comply with evidence-based asthma preventive measures; 2) determine a patient's chronic asthma severity level; 3) determine severity-appropriate asthma preventive medications; and 4) establish effective care transitions to PCPs. The second application, a Web-based Asthma Home Monitoring System (AHMS), also called the electronic Asthma Symptom Tracking and Exacerbation Reduction (e-ASTER), is being used to enable care continuity through continuous (weekly) at-home self-assessment of patients' asthma control, and support of PCPs in monitoring and managing chronic asthma symptoms. A paper-based version of the AHMS, known as the Asthma Symptom Tracker or AST, has also been developed and the questionnaire validated prior to the AHMS implementation.

The RADS system was built from an existing electronic discharge order and discharge instruction (DOADI) tool. The DOADI is currently used throughout Primary Children's Medical Center (PCMC) in Salt Lake City, Utah, by health care providers to facilitate the discharge process for all patients admitted with a medical diagnosis of asthma. The RADS system was designed to automate the multiple functions of the paper-based discharge process. It uses the DOADI as a platform and automatically faxes asthma discharge information to the patient's identified PCP, including the patient's asthma action plan and preventive medications recommended by the hospital provider based on asthma guidelines. The DOADI automatically transfers discharge information to PCPs in an accurate and timely manner.

The e-ASTER application was designed to: 1) engage patients in weekly self-monitoring and self-management of chronic asthma control by prompting compliance with therapy and appropriate and timely physician visits; and 2) support physicians with longitudinal data to assess the effectiveness of asthma therapy and prompt adjustments. The application includes an active real-time feedback and alerting system for patients and their parents to prompt early response to deteriorations in asthma control status.

The e-ASTER application has been developed, programmed, and pilot-tested. Children between the ages of 2 and 18 admitted to PCMC for asthma are invited to participate in the study to evaluate the utility of e-ASTER. Surveys will be administered to hospital providers, PCPs, and patients and their caregivers to evaluate the attitudes, acceptability, and use of the both the RADS and the e-ASTER applications. Qualitative questionnaires and quantitative data (e.g., Web page views, and log-in and log-out times) will be used to determine factors associated with effective use of the health IT applications. Readmission rates within 6 months of the index hospitalization discharge will be assessed to determine the impact of the two health IT applications.

### Specific Aims:

- Develop two IT applications to improve post-hospital care transitions and ambulatory care. **(Ongoing)**
- Evaluate the attitudes, acceptability, and use of the new IT applications. **(Ongoing)**
- Determine factors associated with effective use of new IT applications by hospital providers, PCPs, and patients. **(Upcoming)**
- Determine the effect of implementing new IT applications by measuring specific process measures at the hospital provider, PCP, and patient levels, and on readmissions. **(Upcoming)**

**2012 Activities:** The AST (AHMS paper-based version) was pilot tested among 210 people. Findings demonstrate the AST to be a valid and reliable tool for weekly monitoring and self-management of asthma symptoms. Dissemination of these findings included presentations at two annual meetings and a paper submitted to Pediatrics.

Development of e-ASTER was completed. The project team conducted 2 rounds of usability testing and integrated user feedback into the tool before finalizing it. A manuscript reporting these results was published as part of the American Medical Informatics Association Annual Symposium – Development of a novel tool for engaging children and parents in asthma self-management. The Web site for e-ASTER was launched in July 2012, and recruitment into the e-ASTER pilot test is underway. Additional clinic sites have been added to the study to bolster enrollment, which will continue into 2013. Currently, patients access the e-ASTER through a Web portal. A mobile Web version is being developed and is expected to be implemented in 2013.

In light of the findings from the AST pilot test (paper-based version), there has been a high demand from primary care providers in the region about using e-ASTER as part of a quality improvement initiative.

Dr. Nkoy and his team added to the e-ASTER a Maintenance of Certification (MOC) function for providers. This will allow providers to obtain MOC credits, offering an incentive to providers to use this tool. An application for the MOC was approved by the American Academy of Pediatrics the end of 2012.

As last self-reported in the AHRQ Research Reporting System, project progress and activities are mostly on track, and project spending is on target.

**Preliminary Impact and Findings:** Frequent users of the AST have significantly less acute health care utilization (e.g., emergency department and hospital admissions) than non-frequent users. These findings were presented at the 2012 Pediatric Academic Societies Annual Meeting and the 2012 Academy Health Annual Research Meeting.

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**Target Population:** Asthma, Chronic Care\*, Pediatric\*, Teenagers

**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:** Knowledge Creation

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