

**Project Title:** Improving Asthma Care in an Integrated Safety Net Through a Commercially Available Electronic Medical Record

**Principal Investigator:** Brottman, Gail, M.D.

**Organization:** Denver Health

**Contract Number:** 290-06-0020-5

**Project Period:** 09/07–12/09

**AHRQ Funding Amount:** \$484,760

**Summary Status as of:** December 2009, Conclusion of Contract

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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, and the electronic exchange of health information to improve quality of care.

**Business Goal:** Implementation and Use

**Target Population:** Asthma, Chronic Care\*, Safety Net

**Summary:** The goal of the Health Information Technology and Asthma project is to bring the 2007 National Asthma Education and Prevention Program (NAEPP) asthma guidelines to the point of patient care by incorporating a computerized decision support application into the EpicSystems electronic medical record (EMR). The system meets certification criteria established by the Certification Commission for Health Information Technology; it is the system in use at Hennepin County Medical Center (HCMC) and eight related primary care clinics, the project implementation sites. The application runs on a Java platform within HCMC’s intranet and is integrated into the Epic EMR. “Integration into the Epic EMR” means that 1) the user can invoke it through a routine Epic workflow, and 2) EMR data required for application functioning and for future reporting and analysis automatically are transferred from Epic into the application. The user is not required to either log in again, or to perform double data entry. Once the user has invoked the application, the system guides the user through a typical ambulatory encounter for asthma that follows the evidence-based recommendations expressed in the 2007 NAEPP guidelines for asthma. These recommendations deal with assessments of the level of asthma severity or control based on responses to specific questions about asthma symptoms and lung function, determining the appropriate level of therapeutic aggressiveness, and fulfilling the intended treatment plan through choices of commercially available medications that meet the 2007 NAEPP guideline dosing recommendations for patients of different ages. The application incorporates all provider choices into a one-page, patient-friendly Asthma Action Plan, which the user can print in either English or Spanish. The application also produces an asthma “trigger sheet” (also in English or Spanish), as well as a physician-specific progress note which the user can copy and paste into the appropriate documentation section in Epic.

### Specific Aims

- Develop the electronic decision support tool based on recommendation presented in the NAEPP 2007 Guidelines for the Diagnosis and Management of Asthma. **(Achieved)**
- Create a mechanism that enables a user to call up the e-AAP while logged into a patient’s EMR. **(Achieved)**
- Introduce the e-AAP to providers at eight HCMC primary care clinics, emphasizing how the e-AAP supports quality asthma care. **(Achieved)**
- Create an asthma registry populated by data generated from the e-AAP merged with asthma-relevant data generated by patient EMRs and use the registry as the data source for regular reports showing clinic-by-clinic measures of asthma care quality. **(Achieved)**

**2009 Activities:** After more than a year of development, the e-AAP became technically available at HCMC on June 15, 2009. Creating the technical functionality was the first component of implementation; remaining components involved introduction, orientation, and staff training. These were the dominant activities of 2009. Activities included group trainings and one-on-one instruction on launching and completing the e-AAP during a patient visit. The implementation activities are continuing in the clinics as an ongoing asthma quality improvement project through the HCMC Ambulatory Care Quality Committee and the hospitals' ongoing participation in the Institute for Clinical Systems Improvement. Feedback from providers who have used the application has been mixed. The most negative responses have generally been from older staff physicians who do not feel comfortable navigating the EMR and are generally technology averse. There has also been more pushback from staff physicians in internal medicine who struggle to cover all requirements in a 15-minute appointment with patients who have multiple active problems, including asthma. Conversely, younger providers (including residents) have found the application to be user friendly and easy to launch during patient visits. They find assessment questions and treatment recommendations valuable and time saving. Providers have gotten positive feedback from their patients when using the e-AAP interactively during the visit. Patients have also been enthusiastic about the written asthma action plans they receive generated from the e-AAP.

**Impact and Findings:** The project illustrated the challenges to helping physicians deliver evidence-based medicine in simple, intuitive ways. Challenges are cognitive, technical, administrative, and financial. Cognitive challenges emerge when scrutinizing evidence-based guidelines to determine how they can be operationalized during the delivery of medical care. The project found that guidelines often failed to provide the kind of support that physicians need when they are performing clinical work. The team recommends developing new criteria for guideline quality that include the ability to operationalize recommendations while performing medical work.

Technical challenges that are not associated with converting narrative guidelines into clinical decision support have less to do with creating the support than making the support intuitively available during care delivery. The project did succeed at establishing an Epic-supported mechanism through which clinicians could invoke the electronic decision support tool while engaging in a patient encounter. However, the team did not anticipate all the contexts in which clinicians might invoke the tool and the absence of context information made it challenging to interpret some data. However, because contexts evolve with technology, it may never be possible to anticipate all potential contexts for the purposes of data capture mechanisms.

The team was reminded that software is a product with a very short shelf life and only remains useful to the extent that it is maintained. For clinical decision support software, maintenance needs are of two basic types. One type is technical, modifying the software in response to user feedback about functioning, screen displays, etc; the other is content. When providing clinical decision support, underlying content must reflect current clinical conditions or it will be less than useful at best and harmful at worst. Resources are required to perform these ongoing maintenance activities.

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### **Selected Outputs**

Brottman GA, Computerized asthma decision support tool integrated into an EHR. Demonstration presented at AHRQ Annual Health IT Grantee and Contractor Meeting; 2010 June 2-4; Washington, DC.

Electronic Asthma Action Plan Application Website. Available at: <http://e-aap.net/>

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*\*AHRQ Priority Population*