

<b>Project Title:</b>	Improving Pediatric Safety and Quality with Healthcare Information Technology
<b>Principal Investigator:</b>	Ferris, Timothy G., M.D., M.P.H.
<b>Organization:</b>	Massachusetts General Hospital
<b>Mechanism:</b>	RFA: HS04-012: Demonstrating the Value of Health Information Technology (THQIT)
<b>Grant Number:</b>	R01 HS 015002
<b>Project Period:</b>	09/04 – 09/08, Including No-Cost Extension
<b>AHRQ Funding Amount:</b>	\$1,489,826
<b>Summary Status as of:</b>	September 2008, Conclusion of Grant

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**Strategic Goal:** Develop and disseminate health IT evidence and evidence-based tools to improve health care decisionmaking through the use of integrated data and knowledge management.

**Business Goal:** Knowledge Creation

**Summary:** Health information technology (IT) and clinical decision support (CDS) tools are promising strategies for improving care. A common thread running through much of the current thinking regarding health IT is the potential for the electronic health record (EHR) to improve the safety and quality of health care. The EHR may be conceptualized as the collection of traditional hard copy (paper and ink) medical records in electronic media. Health information in an electronic format may itself improve health care in several specific ways, most notably with respect to portability of health information. Nonetheless, many, if not most, of the benefits from an EHR involve computerized CDS—tapping into the power of organized electronic information to warn, remind, and even correct clinicians at the point of care delivery. Many pediatric practices in the United States have not adopted EHR, in part due to cost, but also because of limited information on the value of CDS. Relatively little research has quantified the value of CDS in pediatrics. Additionally, many who use EHRs have not adopted CDS features, due either to the lack of data demonstrating added value of CDS and/or to poor availability of pediatric-specific CDS features.

For this project, the study team developed pediatric-specific CDS components and measured the value to patients and clinicians resulting from these features. CDS was tested related to: 1) weight-based dosing, 2) reminders for preventive and chronic illness care, 3) electronic results management, and 4) documentation templates. Nine group randomized controlled trials were conducted at 15 pediatric practices. The project then measured outcomes—including dosing errors, guideline adherence, and quality of documentation—related to each intervention and surveys assessed the impact of the CDS on physician workflow and satisfaction.

**Specific Aims:**

- Assess the influences of decision support for medication prescribing on dosing and selection of preferred agents. The controlled trial was designed to assess effects of an EHR with weight-based dosing decision support on rates of dosing errors and adverse drug events. **(Achieved)**
- Assess the influences of decision support for medication prescribing on a selection of preferred agents. The controlled trial determined effects of diagnosis-based medication recommendations (smart forms) on rates of guideline-adherent medication prescribing and physician satisfaction. **(Achieved)**
- Assess the influence of a test results tracking system, Results Manager, on the management of laboratory tests. This assessment determined effects of Results Manager on the protocol for followup of common tests performed in pediatric practice, effects of Results Manager on time to

followup of common tests, and physician attitudes regarding the value (safety and quality benefits) of electronic results management. **(Achieved)**

- Assess the influence of reminders for guideline adherence in delivery of preventive services and in the care of children with chronic conditions. These controlled trials assessed the following outcomes: 1) the effects of reminders and templates on recorded weights, review of symptoms, and ordering of lipid profiles for children with obesity; 2) the effects of reminders and templates on the frequency of symptoms checks among children with attention deficit disorder; 3) the effects of reminders on lead screening, Chlamydia screening, and anemia screening in eligible patients; and 4) the physician attitudes regarding the value of reminders. **(Achieved)**

**2008 Activities:** Activities during 2008 included the end of data collection and data analysis, as well as several poster presentations of results. Results are being disseminated, including pediatric CDS tools on the Agency for Healthcare Research and Quality Health IT Web site. All aims have been achieved. Hypotheses were confirmed with statistical significance.

**Impact and Findings:** CDS was found to significantly improve medication safety, practice efficiency, guideline adherence, and documentation. Improvements were found in all three clinical domains, including preventive services, acute illness care, and chronic illness care. Low usage of CDS limited the effectiveness of the interventions. The reduction in dosing errors was partially offset by errors resulting from improper use of the CDS. Further improvements in quality and safety are possible through increased physician use of CDS, but this will require physician willingness to change their workflow, as well as improvements to EHR software.

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### **Selected Outputs**

Atlas SJ, Grant RW, Ferris TG, et al. Patient-physician connectedness and quality of primary care. *Ann Intern Med* 2009;150(5):325-35.

Ferris TG, Johnson SA, Co JP, et al. Electronic results management in pediatric ambulatory care: qualitative assessment. *Pediatrics* 2009;123 Suppl 2:S85-91.

Ferris TG. IPSQWHIT: Measuring the Quality Improvements Associated with Decision Support in Pediatrics. AHRQ 2008 Annual Conference presentation; 2008 Sept 8; Bethesda, MD. ([PowerPoint® File](#); [Web Version](#)).

Provided content for the Pediatric Rules, Reminders, and Documentation Templates as part of the National Resource Center's (NRC's) Health IT tools on AHRQ's NRC Web site. Available at: Agency for Healthcare Research and Quality (<http://healthit.ahrq.gov>). [Pediatric Rules and Reminders](#). [Pediatric Documentation Templates](#).

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**Grantee's Most Recent Self-Reported Quarterly Status:** This grant has been completed.

**Milestones:** Progress is mostly on track.

**Budget:** On target.