

Project Title: Valuation of Primary Care-Integrated Telehealth
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Organization: University of Rochester
Mechanism: RFA: HS04-012: Demonstrating the Value of Health Information Technology (THQIT)
Grant Number: R01 HS 015165
Project Period: 09/04 – 09/08, Including No-Cost Extension
AHRQ Funding Amount: \$1,464,778
Summary Status as of: September 2008, Conclusion of Grant

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

Summary: Childhood illness places parents in a difficult situation. One study found that a child's illness accounted for 40 percent of missed work for parents of young children. Another study, based on a nationally representative sample of working women, found that only 39 percent had someone they could call on to help with childcare the next time their child is sick. Most women reported either that they would need to miss work (49 percent) or that they would not know what to do (7 percent) if this occurred. Work absence due to care for a sick child means loss of pay for most women of lower socioeconomic status. Inner city parents may jeopardize employment by leaving work as demanded. Other parents, anxious to keep jobs that they cannot afford to lose, try to avoid or delay picking up their child, or they hasten the return of ill children to childcare.

Childcare programs and elementary schools have the difficult responsibility of determining whether to exclude a child due to illness. Almost all childcare programs and schools in Rochester adhere to recommendations of the American Academy of Pediatrics (AAP) and the American Public Health Association (APHA). While the AAP/APHA recommendations have been systemically developed to reduce the spread of serious infectious disease and encourage treatable children to seek medical attention, exclusion policies are subject to judgment, and the decision to exclude a child because of illness is often a source of tension between childcare staff and parents. Prevailing policies often require an office visit for a physician to certify readiness for return to childcare.

The project's telemedicine network is intended to address these problems. Health-e-Access (HeA) is a form of communications infrastructure to facilitate access to health services. The organizational and technical design of HeA focuses on: establishing and sustaining access sites in convenient community locations, using information technology to enhance communication with clinicians in a remote location, and enabling connection with clinicians from the patient's own primary care medical home. In preliminary work, completed prior to the awarding of this grant, a study of five inner-city childcare programs demonstrated a large reduction in absence due to illness (63 percent) for children served by HeA. The HeA telemedicine model was designed to enable diagnosis and treatment decisions for acute problems that commonly arise in childcare and elementary school settings. Direct participants in telemedicine encounters include: a child with a health problem; a telemedicine assistant and sometimes a parent, all at the child site; plus a telemedicine clinician at a remote site. Visits are completed through real-time interactive (videoconference), store-and-forward, or both forms of telemedicine. The clinician site may be located anywhere with broadband Internet access and modest personal computer equipment.

Specific Aims

- Expand Health-e-Access (HeA) as a telehealth model. **(Achieved)**
- Assess the value of telehealth in child programs (childcare, schools) to the health care system. **(Achieved)**
- Describe the process of integrating telehealth in primary care, and assess the value of integrated telehealth to both families and clinicians. **(Achieved)**

2008 Activities: The observation period for Health-e-Access continued through April 30, 2008. Subsequently, analyses were conducted and findings prepared for publication.

Impact and Findings: The HeA Network expanded to include 22 child sites and 10 primary care practices serving the children at these sites. Child sites in the city included five childcare programs and seven elementary schools. Suburban child sites included five childcare programs and five elementary schools. The 10 medical practices were equally split between those located in city and suburban areas. Over the 7 years between May 1, 2001, when the first HeA visits were done, and April 30, 2008, the end of the study observation period, 6,511 telemedicine visits were attempted. Analysis demonstrated strong relationships ($p < .001$) between several potentially confounding variables and utilization. An exception was the relationship between socioeconomic area and overall utilization rate for acute illness, where there was no statistically significant difference. In stark contrast to use for illness, emergency department (ED) use rates were significantly greater for inner city (57.2 visits per 100 child-years) and rest-of-city children (51.2) than for suburban children (15.6). Overall illness use rates, including both visits to traditional sites (ambulatory and ED visits) and telemedicine visits were 22.9 percent greater for intervention than control children (336.4 vs. 273.7 visits per 100 child-years). The higher overall use for intervention children is attributable to telemedicine use, at a rate of 83.6 per 100 child-years. Rates among the intervention group for ED visits and illness office visits, however, were 23.7 percent less (44.1 vs. 57.7 per 100 child-years) and 3.3 percent less (208.8 vs. 216.0 per hundred child-years), respectively, than those for the control group.

Parents were interviewed before and after experience with telemedicine to assess acceptance and satisfaction. The 896 completed surveys included 578 pre-telemedicine surveys and 318 surveys completed following at least one telemedicine encounter. Surveys were completed by 800 unique individuals. Both pre- and post-telemedicine surveys were completed by 96 respondents, allowing 96 pre versus post comparisons. Almost all (94.5 percent) of the 800 respondents identified a source of primary care for their children, and 57.4 percent of these primary caregivers were affiliated with HeA. Children with a primary care practice located in the city were much more likely ($p < .001$) to use a primary care practice that participated in HeA than children using a suburban practice. On average, parents estimated the total time for a doctor's office visit, including transportation, was 2.44 hours. Among the 572 respondents working at the time of they were surveyed, 34.9 percent indicated they would lose pay when they missed work due to a child's illness. Among all 800 respondents, 61.3 percent had, at some time, picked up a child due to illness and 72.5 percent had, at some time, kept a child home from school or childcare due to illness. For parents who had missed work or school to pick up a child within the past 3 months, the estimated number of times averaged 1.79 and the estimate hours lost averaged 7.72. For parents who had missed work or school to keep an ill child home within the past 3 months, the estimated number of times averaged 1.77, and the estimated hours lost averaged 11.94. Open-ended questions revealed strongly positive attitudes and perceptions among the 318 respondents who had experienced telemedicine.

The impact of Health-e-Access, especially the 63 percent reduction in absence from childcare due to illness, is partly attributable to protocols and procedures adopted in telemedicine implementation rather than the technology itself. For example, lines of communication and expectations established through HeA encouraged child site staff to engage clinicians and parents directly in useful communication,

centered on management of the child's health problem on-the-spot, rather than simply requiring parents to remove their child from school.

Overall, this study validates commitment to family convenience as an effective means to decrease costs while improving access.

Selected Outputs

McConnochie K, Wood N, Herendeen N, et al. Integrating telemedicine in urban pediatric primary care: provider perspectives and performance. *Telemed J E Health* 2010;16(3):280-8.

McConnochie KM, Wood NE, Herendeen NE, et al. Acute illness care patterns change with use of telemedicine. *Pediatrics* 2009;123(6):e989-95.

Kopycka-Kedzierawski D, Billings R, McConnochie KM. Dental screening of preschool children using teledentistry: a feasibility study. *Pediatr Dent* 2007 May-Jun;29(3):209-13.

McConnochie KM, Tan J, Wood NE, et al. Acute illness utilization patterns before and after telemedicine in childcare for inner-city children: a cohort study. *Telemedicine J E Health* 2007;13(4):381-90.

McConnochie KM. Potential of telemedicine in pediatric primary care. *Pediatr Rev* 2006 Sep;27(9):e58-65.

McConnochie KM, Connors GP, Brayer AF, et al. Differences in diagnosis and treatment using telemedicine versus in-person evaluation of acute illness. *Ambul Pediatr* 2006;6(4):187-95.

McConnochie KM, Connors GP, Brayer AF, et al. Effectiveness of telemedicine in replacing in-person evaluation for acute childhood illness in office settings. *Telemedicine J E Health* 2006;12(3):308-16.

McConnochie KM, Wood NE, Kitzman HJ, et al. Telemedicine reduces absence resulting from illness in urban child care: evaluation of an innovation. *Pediatrics* 2005;115(5):1273-82.

Grantee's Most Recent Grantee Self-Reported Quarterly Status: This grant has been completed with all major aims achieved.

Milestones: Progress is completely on track.

Budget: On target.