

**Project Title:** Impact of Consumer Health Informatics Applications  
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**Organization:** Johns Hopkins University  
**Contract Number:** 290-07-10061  
**Project Period:** 08/08 – 10/09  
**AHRQ Funded Amount:** \$278,850  
**Summary Status as of:** October 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 in care settings, and the use of electronic exchange of health information to improve quality of care.

**Business Goal:** Synthesis and Dissemination

**Target Population:** General

**Summary:** Many people are excited about the potential of health information technology (IT) and consumer oriented electronic health solutions to improve public health. This field is commonly referred to as consumer health informatics (CHI). Despite the interest, however, there has not been a rigorous review of the effects of CHI on health and health process outcomes. This project is a comprehensive review of current literature on CHI, defined as “any electronic tool, technology, or electronic application that is designed to interact directly with consumers, with or without the presence of a health care professional, that provides or uses individualized (personal) information and provides the consumer with individualized assistance to help the patient better manage his or her health or health care.” The literature review focuses on four key areas: (1) the impact of CHI on a variety of health outcomes (including process, intermediate, clinical, and economic outcomes), (2) barriers to implementation of CHI, (3) estimates of the cost and net value of CHI, and (4) evidence needed for broader CHI adoption. Literature is identified through a structured search of several databases, references in review articles, recommendations by experts, and grey literature, such as conference proceedings.

### Specific Aims

- Review the literature on influence of currently developed consumer health informatics. **(Achieved)**
- Identify gaps in consumer health informatics literature. **(Achieved)**
- Make recommendations for future consumer health informatics research. **(Achieved)**

**2009 Activities:** The project team reviewed literature databases using a search strategy based on a definition of “consumer” and framed by the key research questions. An emphasis of the search was to find randomized clinical trials on CHI’s impact on outcomes. Identified literature was reviewed for inclusion based on several criteria, including results from a quality scoring system for the randomized clinical trials. After data was abstracted, a second reviewer verified the quality and consistency of the data. At the completion of the review, the evidence for each type of outcome in each clinical area was graded for quantity, quality, and consistency. Throughout the project, the core team sought feedback from external experts in systematic reviews and sent them a draft report for comments and revisions prior to submitting the final evidence report.

**Impact and Findings:** The review of the available literature suggests that some CHI applications can effectively engage consumers, enhance traditional clinical interventions, and improve both intermediate and clinical health outcomes. One hundred and forty-six articles were included in the CHI review, the majority of which studied educational Web sites (55 percent). A smaller proportion of published CHI

research focused on computer-generated tailored feedback applications (15 percent), personal monitoring devices (8 percent), and interactive computer programs (8 percent). The majority (58 percent) of CHI applications were designed for use in the patient's home. The studies were varied in the health conditions of interest, ranging from chronic disease and cancer to mental health and Alzheimer's disease. The review suggests that CHI can have a positive impact on intermediate health and clinical outcomes. The majority of studies found evidence of significant positive effect on clinical outcomes. None of the studies found evidence of harm. Studies evaluated in the review suggested three critical elements often found in CHI applications that exert a significant effect on health outcomes. These three elements are: (1) individual tailoring – i.e., the intervention uses information on the specific characteristics of an individual; (2) personalization – i.e., the method of delivery is specified to the individual; and, (3) behavioral feedback.

No conclusions could be made regarding the impact of CHI on economic outcomes, as only three studies reviewed economic outcomes, and each used different economic metrics and methodologies. Thirty-one studies addressed CHI barriers, including systems-level barriers (e.g., hardware and internet access), individual-level barriers (e.g., patient literacy), and challenges of incorporating CHI for the clinic staff. Gaps in CHI research identified by the review include the need to study differences in patient preferences for CHI based on knowledge, attitudes, beliefs, needs, utilization, gender, age, and race/ethnicity as well as the need to evaluate the role of CHI for different patient populations (children, seniors, racial and ethnic minorities, disabled).

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### **Selected Outputs:**

Gibbons MC, Wilson RF, Samal L, et al. Impact of consumer health informatics applications. Rockville (MD): Agency for Healthcare Research and Quality; October 2009. Evidence Report/Technology Assessment No. 188. (Prepared by Johns Hopkins University Evidence-based Practice Center under contract No. HHS 290-2007-10061-I). AHRQ Publication No. 09(10)-E019.