

# Health IT-related obstacles and facilitators in coordinating care for patients with chronic illness: A longitudinal study

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## ABSTRACT

**Introduction:** Coordinating care for patients with chronic illness is a major challenge for healthcare as these patients interact with multiple providers and healthcare organizations during their journey. Health information technology (IT) has been proposed to support care coordination, but can bring its own challenges. In this longitudinal study we examined the obstacles and facilitators experienced by care managers in using various forms of health IT. **Methods:** We interviewed 14 hospital and outpatient care managers who coordinated care for patients with chronic illnesses across multiple transitions of care. These interviews were conducted over a period of one year. **Results and discussion:** Care managers experienced both obstacles and facilitators in their use of health IT for care coordination. Despite technical and human factors problems with the technologies, care managers described several benefits of health IT.

## KEYWORDS

*Care coordination; health information technology; performance obstacles and facilitators; longitudinal study.*

## INTRODUCTION

Care of patients with chronic illness accounts for approximately three quarters of all healthcare expenditures in the US (Bodenheimer, 2002). It has been difficult to design and implement sustainable interventions to coordinate care for these patients as they transition among hospitals, home, clinics, and nursing homes. Health information technology (IT) can play a key role in supporting care coordination; however, the use of health IT to improve care for patients with chronic illness can be challenging (Alyousef et al., 2012; Bates, 2010; Carayon et al., 2012). In this study we focus on the role of care managers who coordinate care for patients with chronic illness and identify the obstacles and facilitators that they experience in using various forms of health IT to access, share and manage patient information.

## BACKGROUND

Care coordination for patients with chronic illnesses such as heart failure (HF) or chronic obstructive pulmonary disease (COPD) can be very complex. These patients often journey through multiple transitions of care as they are cared by numerous providers and healthcare organizations. These transitions pose unique coordination challenges because of the large variety of healthcare professionals and organizations involved in patient care. Numerous studies have identified care quality and patient safety issues in these care transitions (Holland & Harris, 2007; Kahn & Angus, 2011; Nelson & Carrington, 2011).

Health IT has been suggested as a key component of care coordination; but numerous challenges have been identified in the use of health IT for care coordination for patients with chronic illness (Bates, 2010; Carayon et al., 2012; O'Malley, 2011). Challenges include communication and sharing of information among clinicians and healthcare organizations, and information overload (Bates, 2010). O'Malley et al. (2010) interviewed 60 physicians and staff in 26 physician practices about their experience with electronic health records (EHR), i.e. one type of health IT, and the use of EHR to support coordination activities. Both EHR-related facilitators and obstacles to care coordination were identified. For instance, the EHR can provide immediate access to patient information (facilitator), but it may be hard to find information in the EHR (obstacle). Further understanding of care coordination challenges and opportunities for improvement offered by health IT is necessary.

Many different models have been proposed to improve care coordination. Recently, the patient-centered medical home (PCMH) has been developed as a new way of organizing primary care to benefit all patients, but more



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particularly patients with chronic illness. According to Stange et al. (2010), PCMH is “a team of people embedded in the community who seek to improve the health and healing of the people in that community. They work to optimize the fundamental attributes of primary care combined with evolving new ideas about organizing and developing practice and changing the larger health care and reimbursement systems.” (page 602) Care managers play a key role in the PCMH model; they are nurses who coordinate care and ensure that care gaps are closed and patients receive high-quality, safe care.

Care managers perform a range of activities to coordinate care, such as reviewing and reconciling medications, and ensuring that patients have a follow-up appointment with their primary care physician and that appropriate referrals (e.g., home health services) are in place (Brown, Peikes, Peterson, Schore, & Razafindrakoto, 2012; Maliski, Clerkin, & Litwin, 2004; Oliva, 2010). Care managers also educate patients about their diseases so that patients manage the unique signs and symptoms of their disease and are more actively engaged in their own care. Numerous care managers’ activities rely on health IT applications, so that care managers have access to patient information, share information with others who care for the patients, and document their work (Alyousef et al., 2012; Carayon et al., 2012).

Care coordination has been defined as: “the deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient’s care to facilitate the appropriate delivery of health care services. Organizing care involves the marshalling of personnel and other resources needed to carry out all required patient care activities and is often managed by the exchange of information among participants responsible for different aspects of care.” (McDonald et al., 2010) (page 4). Care coordination manages the interdependencies between activities and people (Klein, 2001; Malone & Crowston, 1994), such as sharing patient information. Klein (2001) has identified several features of successful coordination, including preparation, planning and monitoring. Research on care coordination has not demonstrated whether health IT can support these features of successful coordination.

The purpose of this study is to assess the health IT-related obstacles and facilitators experienced by care managers in coordinating care for patients across transitions of care. In conducting this study we aimed to identify whether and how health IT can support the key features of successful coordination identified by Klein (2001).

## **STUDY CONTEXT**

The Keystone Beacon project provides the context for this study. The Keystone Beacon project aims to improve care coordination for patients with chronic illness (Heart Failure or HF and Chronic Obstructive Pulmonary Disease or COPD) in Central Pennsylvania, US: “Keystone Beacon is demonstrating how integrated care can be coordinated community-wide through the use of patient-focused technology and specialized nurse care managers.” (<https://www.keystonebeaconcommunity.org>) The specialized nurse care managers are located in hospitals, clinics and a transition of care center. Inpatient or hospital-based care managers support and coordinate care for Beacon patients until their discharge. Outpatient care managers that work in participating physician practices manage HF and COPD patients as long as necessary. A transition of care (TOC) center was created to support care coordination for patients discharged from hospitals that did not have an outpatient care manager. TOC care managers call patients every week – or as needed – for 30 days post-discharge. To perform their job care managers need to access and share information and, therefore, use multiple health IT applications, including the case management software (primarily for documentation and sharing of information among the care managers), the local health IT (e.g., EHR in a hospital) and the health information exchange technology that supports exchange of patient information among participating organizations.

## **METHODS**

### **Study design**

In the context of the Keystone Beacon project, we used a qualitative approach using interviews of Beacon care managers in all three settings: hospitals, clinics and TOC. The interviews were conducted at five different times over a one-year period (May’2011 to May’2012) in order to capture changes in performance obstacles and facilitators from the time that the first care managers were hired (May’2011) to one year later (May’2012).

### **Setting/sample**

A total of 14 care managers were interviewed: 5 inpatient care managers, 2 outpatient care managers, 5 TOC care managers and 2 ‘float’ care managers who worked in various settings (e.g., to help when a care manager was on vacation). At each of the five interview times, between 4 and 11 of the 14 care managers participated in data collection.

### **Data collection instrument**

We used a semi-structured interview guide to collect information on performance obstacles and facilitators experienced by the care managers. Over one year, 33 interviews were conducted for a total of about 54 hours. Two researchers conducted the interviews. The interviews were audio-recorded (all with interviewee consent).

The interviews were then transcribed and any mention of names and healthcare organizations was removed from the transcripts.

### Data analysis

We analyzed the interview data using the NVivo© qualitative data analysis software. The transcripts of the interviews were imported into NVivo© and were coded to identify health IT-related obstacles and facilitators. Researchers identified health IT-related obstacles or facilitators and described them in separate annotations. Several transcripts were analyzed by multiple researchers to ensure consistency of coding. Multiple meetings took place to resolve any discrepancy or disagreement in coding and to refine the coding scheme.

## RESULTS

Analysis of the interview data produced quantitative data in the form of the number of care managers reporting health IT-related obstacles and facilitators, and the number of separate obstacles and facilitators. We also conducted a qualitative analysis to describe how the nature of health IT-related obstacles and facilitators changed over time.

### Longitudinal analysis of health IT-related obstacles and facilitators – Quantitative analysis

A summary of the longitudinal analysis of health IT-related obstacles and facilitators is presented in Figure 1. The percentages of care managers who reported health IT-related obstacles (below the 0% horizontal line) and facilitators (above the 0% horizontal line) did not vary significantly over time as shown in Figure 1.

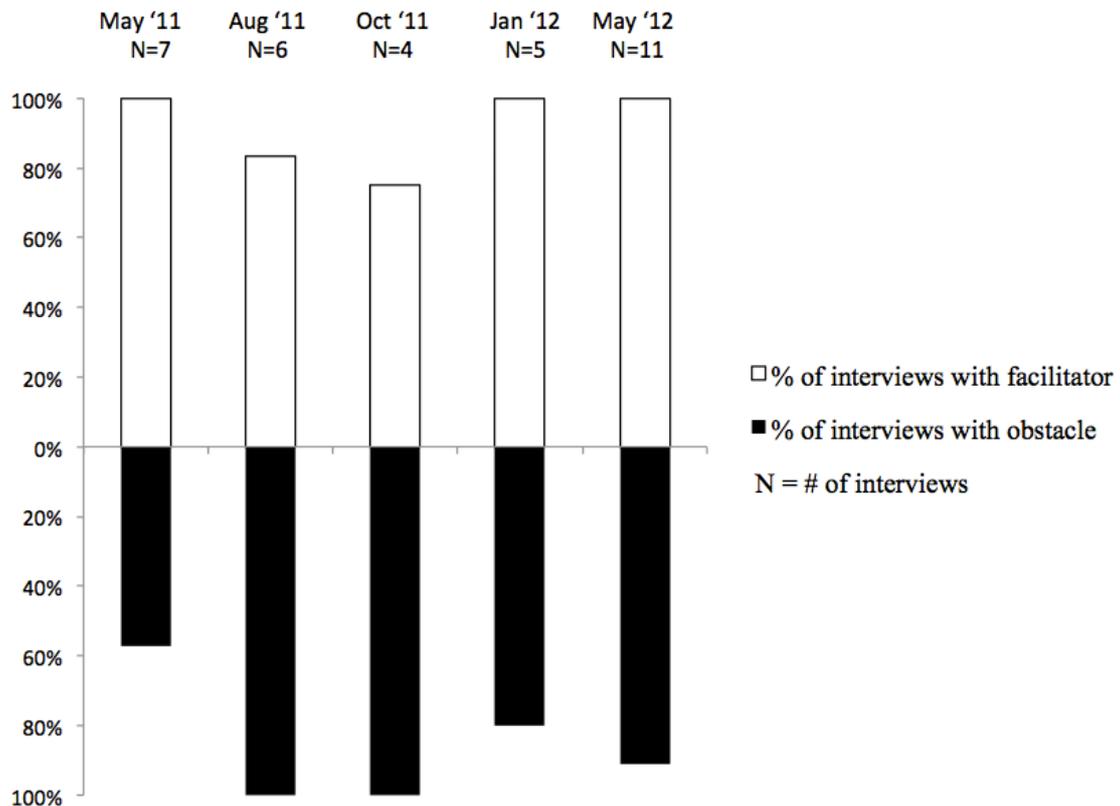


Figure 1. Health IT-related obstacles and facilitators experienced by care managers

Table 1 shows the number of separate health IT-related obstacles and facilitators experienced by the care managers at each of the five data collection times. During the first data collection (May'2011), a large number of obstacles was reported in contrast to a small number of facilitators. The number of obstacles decreased by the second round of interviews, but then did not change much over time, whereas the number of facilitators tended to increase.

**Table 1.** Separate health IT-related obstacles and facilitators over time

	May'2011	August'2011	October'2011	January'2011	May'2012
Number of interviews	7	6	4	5	11
Number of separate obstacles	31	11	17	12	19
Number of separate facilitators	6	21	10	20	29

**Longitudinal analysis of health IT-related obstacles and facilitators – Qualitative analysis**

In the early data collection care managers described several obstacles related to the difficulty of learning to use various health IT applications. During the first couple of months on the job several care managers talked about not having access to the health IT applications that they needed to perform their job. These obstacles decreased over time as care managers became more skilled at using various health IT applications and they were given access to better tools. Over time care managers talked about access to different health IT applications as a facilitator.

Some obstacles decreased over time. Initially, care managers often had problem with patient information that was not accessible, up-to-date, complete or timely. This obstacle decreased over time as, in particular, the health information exchange technology was used by an increasing number of clinicians and increasing number of patients provided authorization to share their information.

Some obstacles were consistently experienced over time. For instance, care managers often talked about technical problems, such as slow connections and having to reboot their computer. They described several usability issues with the different health IT applications. For instance, they talked about a poorly designed case management software (e.g., lots of clicks, dropdown menus with insufficient options) and challenges in locating information in some of the EHRs they used in the local hospitals or clinics.

The use of multiple health IT applications was described as both an obstacle and a facilitator. Care managers had to double document in the case management software as well as the local EHR of the hospital or clinic. This double documentation is an obstacle created by the lack of inter-operability of the various health IT applications. On the other hand, care managers described the benefit of having access to multiple health IT applications because it provides them with more complete information on their patients: they can develop a better mental model of what is happening with their patients. Specifically, access to multiple health IT applications is useful for outpatient care managers who can monitor various care activities for their patients and follow up on scheduled care activities.

As care managers developed expertise with the health IT, they talked about the benefits of the technologies for sharing information with other clinicians and providers. In particular, inpatient care managers talked about their increasing ability to share patient information with outpatient and TOC care managers. This sharing of information is critical as patients move through various care transitions such as hospital to home.

**DISCUSSION AND CONCLUSION**

Coordinating care for patients with chronic illness involves the management of interdependent activities performed by multiple people located in various healthcare organizations (e.g., hospital, clinic) and other settings (e.g., home). In the Keystone Beacon project, care managers were at the core of the care coordination network; they were the ‘glue’ between the disparate healthcare professionals and organizations that care for these patients. To perform their job they needed to access and share information and, therefore, used multiple health IT applications to support their functions of monitoring and communication. Care managers described how the multiple health IT applications allowed them to develop a mental model of what was happening with their patients. Over time care managers began to describe the benefits of health IT to share patient information with other care managers and clinicians. However, they also experienced a number of health IT-related obstacles, such as reliability (e.g., slow connections), usability (e.g., locating information) and access.

Coordination can be particularly challenging when information needs to flow across multiple organizations. This is a major problem in health care because of the lack of inter-operability of health IT applications. Despite this and other technical and human factors problems, care managers identified many benefits of health IT for care coordination. As the need to provide more efficient care coordination becomes more apparent, we need to continue to refine our understanding of care coordination to develop usable and useful health IT applications.

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