Organizational strategies for promoting patient and provider uptake of personal health records

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ABSTRACT

Objective To investigate organizational strategies to promote personal health records (PHRs) adoption with a focus on patients with chronic disease.

Methods Using semi-structured interviews and a web-based survey, we sampled US health delivery organizations which had implemented PHRs for at least 12 months, were recognized as PHR innovators, and had scored highly in national patient satisfaction surveys. Respondents had lead positions for clinical information systems or high-risk population management. Using grounded theory approach, thematic categories were derived from interviews and coupled with data from the survey.

Results Interviews were conducted with 30 informants from 16 identified organizations. Organizational strategies were directed towards raising patient awareness via multimedia communications, and provider acceptance and uptake. Strategies for providers were grouped into six main themes: organizational vision, governance and policies, work process redesign, staff training, information technology (IT) support, and monitoring and incentives. Successful organizations actively communicated their vision, engaged leaders at all levels, had clear governance, planning, and protocols, set targets, and celebrated achievement. The most effective strategy for patient uptake was through health professional encouragement. No specific outreach efforts targeted patients with chronic disease. Registration and PHR activity was routinely measured but without reference to a denominator population or high risk subpopulations.

Discussion and conclusion Successful PHR implementation represents a social change and operational project catalyzed by a technical solution. The key to clinician acceptance is making their work easier. However, organizations will likely not achieve the value they want from PHRs unless they target specific populations and monitor their uptake.

Key words: personal health records, chronic disease, electronic health records, adoption, quality

BACKGROUND AND SIGNIFICANCE

Online personal health records (PHRs) connected to an organization’s electronic health records (EHRs) have been implemented by a number of US health institutions over the last decade.1 Also called patient portals, these applications allow patients a secure internet entry point or view to their health information, facilitate patient-provider messaging, and provide other functions such as prescription refills, scheduling of appointments, and access to patient educational materials. With recent US health information technology (HIT) policies incentivizing timely patient access to their medical records, it is likely that many more healthcare organizations will be offering their patients electronic access in the near future.2,3 For those patients who have adopted PHRs, studies indicate that they increase patient-provider communication and enhance patient empowerment and satisfaction.4–6 The potential value for high needs and high costs populations, such as those with chronic conditions, is increasingly being recognized.7 A 2010 consumer survey found that ‘people with two or more chronic conditions and those from lower-income households are among the most likely to say their PHR led them to do something to improve their health’.8 Furthermore, 52% of those surveyed with multiple chronic conditions reported asking their doctors questions they would not have otherwise asked.8 Allowing patients to check their medication and other health information (eg, test results) may also enhance patient safety and avoid test duplication.

Implementing PHRs represents a significant systemic change in care delivery and may not be successful, at least in the near term. Recent examples are the large scale summary care record projects in the UK and France. These have yet to achieve widespread adoption.9,10 All new technologies and
interventions have the capacity to increase disparities in health outcomes due to differential uptake—especially for deprived populations who also bear a disproportionate burden of chronic disease. Indeed, PHR users have been reported to be very different from non-PHR users by age (middle-aged and older more than younger patients), gender (women more than men), ethnicity (European more than other ethnic groups), socioeconomic status (insured, higher education, higher income), and presence of co-morbidities (increased adoption for those with chronic diseases).11–15

Our study aimed to support organizations seeking to implement and maximize PHR uptake by collating strategies from leading US healthcare institutions who have successfully introduced this e-solution within ‘business as usual’. We focused on strategies for uptake and monitoring for all adult patients and whether or not there were specific approaches for high risk subpopulations with chronic disease.

MATERIALS AND METHODS

Sampling frame
A purposive sample was developed through a two-step process. First, we asked staff at the Office of the National Coordinator for HIT, patient-centered care experts, and HIT experts, to identify organizations that they recognized as PHR innovators. Second, the identified sites had to have a PHR in place for at least 12 months and be recognized as high performers in Hospital or Clinician Group Consumer Assessment of Healthcare Providers and Systems (HCAHPS or CAHPS) surveys.16,17 High performance was defined as being in the top 75th percentile for two overall rating questions (patient ‘global rating of care’ and ‘willingness to recommend’).

Study instruments
A semi-structured interview guide and survey questionnaire were developed to solicit informant information; these have been described in full elsewhere.18 The tools were based on prior literature review and research (RR, DWB)19 and expert opinion. The specific questions relating to this paper are detailed in box 1.

Study participants
Within each eligible organization, HIT leaders and clinical directors who were managing ‘high-risk’ or chronic disease populations were invited to participate. The study instruments were piloted with one site to ensure clarity and minor changes were made based on the feedback. After receiving consent, we scheduled a time for a telephone interview and sent participants a web-link to the survey. One author (SW) conducted the interviews, which were digitally recorded; a transcribing service provided verbatim manuscripts.

Analysis
Researchers imported transcribed interviews into AtlasTi (ATLAS.ti, Berlin, Germany) and entered data from the surveys into Excel (Microsoft Windows 7). Using a grounded theory inductive approach as described by Straus and Corbin,20 three authors (SW, AP, RR) systematically coded the transcripts to identify, categorize, and sort key concepts. An audit log of decisions was kept along with codes arising from the interviews. We then grouped codes into emergent themes and relationships after iterative reading and discussion with the two other authors (MD, DWB).

IRB approval
The study was approved by the Partners Institutional Review Board (2010-P-000179/20).

RESULTS
Nineteen healthcare organizations met our sampling criteria; of these, 16 (84%) agreed to participate, two declined, and one did not respond to our invitations. Each organization returned the web survey and we conducted 30 telephone interviews with informants from organizations located in all major US regions.21 Six were Chief Information Officers, 11 were Directors of e-Health Services, five had other health informatics titles (eg, Vice President of Information Technology, Medical Informaticist), and eight were Medical Directors or internists with specialized roles in chronic disease management, quality, primary care, or population health. The informants were mainly physicians (80%).

Box 1: Specific interview questions on strategies for implementation

- What has your organization done to promote personal health record (PHR) registration?
- Have you done anything to encourage physicians or nurses to recommend use of the PHR to their patients? (and what has been the most effective?)
- What have you found to be the major barriers for a patient to register? (and how have you addressed these?)
- Once registered, what are the major barriers for patients to get on-line and view their records? (and how have you addressed these?)
- What do you think has been the most effective in addressing registration and access barriers?
- If you had some advice for organizations thinking about implementing a PHR, what would that be?
- What future strategies or approaches are being considered to improve usage of PHR?
Table 1 summarizes the characteristics of the participating organizations. Thirteen of the 16 (81%) organizations reported they were integrated delivery systems. Two sites were solely ambulatory care networks and one was solely an academic medical center. In terms of time since initial implementation, four institutions were relatively new (1–5 years), with the remaining 12 having between 6 and 13 years since first introduction. Eight organizations were using a commercially developed PHR product. Of the six institutions which had developed their own ‘home-grown’ PHR, two were looking to switch to a vendor-supplied product in the near future. A further two institutions had adopted a hybrid model (part home grown, part commercially developed). The median unique patient enrolment to each organization’s PHR was 220,000, with 11/16 organizations having between 100,000 and 500,000 registered patients.

PHR uptake and organization attributed populations

Most sample sites did not routinely estimate PHR uptake as a proportion of their attributed denominator population. Twelve of 16 (75%) institutions gave a population-based estimate of PHR uptake but offered heterogeneous denominators such as their primary care panel, all patients seen in ambulatory care over a defined time period, or all medical records. Given these denominator differences, the estimated proportion of patients enrolled to these systems was 42%/40% (mean/median) and ranged from 22% to 75%.

Based on the interviews, organizational strategies for PHR adoption fell into two broad categories: those targeted to patients and those targeted to providers. Implementation strategies were ‘for all’ and left to the discretion of physician or care team to enroll patients. No interviewee reported activities that targeted specific populations, such as patients with chronic disease or those that were high utilizers of hospital or emergency department services. Furthermore, there were no routinely available data on the proportion of adoption by chronic disease subgroup, nor stratification by socio-demographic or other characteristics to determine whether there were differences in uptake. Many interviewees acknowledged that they had no routine way of knowing who (eg, by age, gender, ethnicity, chronic disease) was using this technology or which patients preferred other ways of interacting with the healthcare services.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Type</th>
<th>PHR type: home grown, vendor supplied, or hybrid*</th>
<th>Years implemented</th>
<th>Unique patient registrations</th>
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<tbody>
<tr>
<td>1</td>
<td>IDS</td>
<td>Home grown, switching to vendor soon</td>
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<td>312,000</td>
</tr>
<tr>
<td>2</td>
<td>AMC</td>
<td>Home grown</td>
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<td>60,000</td>
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<td>3</td>
<td>IDS</td>
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<td>&gt;500,000†</td>
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<tr>
<td>4</td>
<td>IDS</td>
<td>Vendor, previously home grown</td>
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<td>259,000</td>
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<tr>
<td>5</td>
<td>IDS</td>
<td>Vendor, previously home grown</td>
<td>10</td>
<td>&gt;500,000†</td>
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<tr>
<td>6</td>
<td>IDS</td>
<td>Vendor</td>
<td>12</td>
<td>200,000</td>
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<tr>
<td>7</td>
<td>IDS</td>
<td>Vendor</td>
<td>11</td>
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<td>IDS</td>
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<tr>
<td>9</td>
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<td>IDS</td>
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<td>IDS</td>
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<td>Hybrid model</td>
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<tr>
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<td>Vendor</td>
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<td>&lt;50,000‡</td>
</tr>
<tr>
<td>16</td>
<td>IDS</td>
<td>Vendor</td>
<td>8</td>
<td>122,000</td>
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</tbody>
</table>

*Hybrid model: PHR is part home grown and part vendor supplied.
†Where registration >500,000, the actual numbers are not shown to protect institutional identity.
‡Estimate only.

ACN, ambulatory care network; AMC, academic medical center; IDS, integrated delivery system; PHR, personal health records.
ORGANIZATIONAL STRATEGIES FOR FACILITATING PROVIDER ADOPTION OF PHR

The greatest barrier to PHR implementation was perceived to be physician resistance due to concerns about the impact on their workload and on their patients. This was coupled with uniform agreement that the single most effective strategy for promoting patient PHR uptake and use was if their trusted health professional encouraged them to do so. While a physician invitation was thought to be the most powerful individual promoting factor, adoption relied on the whole healthcare team (clinical and administrative). Therefore successful implementation depended on addressing practice and clinician barriers.

Organizational strategies for facilitating provider uptake and acceptance were grouped into six main themes: organizational vision, governance and policies, work process redesign, staff training, information technology (IT) support, and monitoring and incentives.

Organizational vision

All organizations had invested in PHR promotion to patients within their own institutions and to the wider community. Advertising was conducted via television and radio commercials, newspapers, community and patient newsletters, the organization’s webpage, and e-mails to patients. One organization had used ‘spectaculars’ for marketing their PHR.

‘You take some average thing and make it oversized, like a big old prop, and put it someplace funny.’

For example, an actor in an oversized costume became a walking, talking urine specimen cup in the downtown area, with a message advertising same-day test results for patients.

Internal promotion to facilitate patient awareness included posters and brochures, waiting room videos, and automated voice messages when phoning the clinic. While some organizations had invested in advertising campaigns, for others this wasn’t a necessity.

‘We, frankly, didn’t do a lot. There was so much pent up demand...in our market. So we did a few fairly simple things. We only did one paid advertisement in a local magazine. Otherwise, we created a prominent marquis promotion on our home page for our consumer-facing website. And then we created some rack cards.’

The key messages to patients were clear and simple, such as ‘Did you know you can email your doctor?’ Or, ‘Did you know you can access your medical records from home?’ Several interviewees mentioned ‘word of mouth’ promotion and anecdotes of patients choosing their health care provider on the basis of having a PHR. Indeed, the availability of a PHR was often advertised as a point of difference in a competitive health care market. One organization differentiated their PHR service by guaranteeing much quicker patient response times than their competitors.

MULTIMEDIA COMMUNICATIONS AND MARKETING

All institutions had assembled governance groups and project teams to develop an array of policies (such as security, privacy, PHR content, protocols for handling concerns, or complaints) and support implementation and issues arising over time. Illustrative quotes are given in table 2. Most of the project teams included management, IT specialists, and clinical directors (table 2A, Governance). Several interviewees strongly recommended also including local well respected clinicians and other multidisciplinary frontline staff who had expressed an interest in PHR implementation. These staff became the PHR champions, their clinics provided early pilot sites, and their PHR stories were used to drive adoption elsewhere. Champions provided frontline leadership, ideas for adoption, and facilitated success by visiting other ambulatory clinics to discuss concerns and impart their knowledge and experience (table 2B, Frontline leadership and experience). The major clinical concerns needing to be addressed were the increased workload required for patient registration and responding to patients via this medium. Specifically, staff worried that they would get bombarded by confused or anxious patients and that a PHR would generate a lot more questions or lead to increased patient complaints. Despite these concerns, many of the interviewees spontaneously volunteered that the fears did not eventuate in reality (table 2C, Clinical fears).

Support from high level management was instrumental to success and played a critical role in communicating the organizational vision, the expectation for clinician engagement, and that the PHR implementation was the organization’s policy (table 2D, E, Importance of executive management support). The majority of organizations had policies that encouraged all employees to sign up for the portal themselves. As a result frontline staff could be comfortable with the system and enrol processes themselves and be able to effectively guide
patients and answer questions. Staff registration also resulted in ideas for PHR process improvements.

**Work process redesign**

Implementation commonly occurred within ambulatory care clinics and required the PHR to be embedded within usual clinical workflow. To address this, several interviewees delayed implementation until they had conducted a formal and thorough work process redesign. Each process such as registration, queries, requests for appointments, or prescriptions was mapped and critiqued. The aims were to make it fit naturally in the workflow, eliminate non-value added work, ensure tasks were shared between provider team members, and demonstrate benefits for physicians. The general idea was to make physician work easier, save time, and improve data capture (Table 2F, G, H, Work process design).

During this work redesign, some organizations changed their processes to pool telephone staff and centrally triage all emails to ensure patient communications were answered by a designated person in a timely manner.

**Staff training**

For the majority of organizations, everybody on the healthcare team was responsible for signing patients up and therefore received training. One institution which had recently implemented a PHR, started communication to frontline staff approximately

| Table 2: Illustrative quotes relating to themes on governance and policies and work process redesign |
|-------------------------|-----------------------------------------------------------------------------------|
| A. Governance | 'We have several layers of governance...ultimately I'm the person accountable for everything. But we have an executive committee that I convene monthly to review policy decisions that need to be made related to the Portal. And underneath them we have a core team, they are sort of operational leaders, more the director, to the medical director level who are looking at our issues and aligning resources behind any operational or technical changes that need to be made. And then, we have various work teams that might look at specific issues, like, we have a lab results group...'
| B. Front line leadership and experience | 'We had to meet with every doctor group, every department...you don’t teach them about the web but you teach them about, in some sense, the etiquette of communicating with your patients online.'
| C. Clinical fears | '. . . there’s going to be that fear of change and that fear of transparency. [But] all those fears have been proven false. Every single cotton picking one of them have been, you know...patients don’t freak out at lab tests, patients don’t over email, patients don’t, you know, have a conniption fit when they see that they have “morbid obesity” on their problem list.'
| D. Importance of executive management support | 'We have a fantastic CEO who...believes that Heath IT is strategic. And so he’s a made it clear to everybody that if you’re not interested helping use Health IT to transform health care, there’s a lot of other places you could work.'
| E. Importance of executive management support | '. . . we would be challenged, you know, “Why are you doing this?” Or, “Why are you doing that?” And having endorsement from your top-level leadership, especially on a policy format allowed us to go back [to departments] and say, “You know, we’re not going to renegotiate the fact that we’re releasing clinical notes; it’s been approved. Here’s the policy”.'
| F. Work process redesign | 'With our physicians, the key to incentivizing them was really in making their indirect care work easier.'
| G. Work process redesign | '...[Physicians were] just terrified that they’re gonna be inundated...the average number of hours a day one of our internists spends managing stuff in their in-basket is three hours a day,... and more and more labs come through because there’s more and more screenings that are required. And it’s just becomes kind of overwhelming. So you have to plan workloads well so that the right people are doing the right work.'
| H. Work process redesign | '[you need to]...do a lot of planning upfront. And the planning I mean is not only how to get the word out to the patients that might be signing up, but planning on how are you going to handle the email communication. How is that going to be built into the providers’ day? And how are you going to integrate it, not only it with their day, but with the patient care plan.'
12 months before ‘go-live’ and felt this lead-time was necessary to sort policies, operations, training, and the implementation process. Several organizations reported developing a mandatory IT course that provided an overview of the PHR and registration process. Training for some organizations included scripting of messages at each stage of the patient visit, including check-in at the front desk, at the time of the nurse ‘rooming in’, at the physician consult, and when having a blood test.

**IT support**

Early on in the implementation process some organizations had arranged in-clinic kiosks to aid patient self-registration and/or had deployed interns or personnel from the IT department to waiting rooms so that they could talk to patients about the PHR, how to sign up, and help them to begin the process. Many interviewees discussed the need to have an IT help desk available at all times to support staff and patients.

**Monitoring patient adoption and incentives**

Organizations routinely monitored new patient registrations, active accounts (patient access at least once in the past year), frequency of access, and utilization of specific features of the PHR (such as laboratory results). Most interviewees reported organizational targets for registration, especially in the early stages. Indicators were typically enrolment goals (number of patients registered) and target times-to-response to a patient electronic query. The rationale for the latter indicator was that provider response was associated with a patient’s continuing PHR use, satisfaction with their healthcare, as well as a safety measure (that messages from patients were not lost in an electronic abyss).

Some of these targets were linked to physician key performance indicators and monetary bonuses. In one organization, 10% of the physician’s compensation was based on meeting three of five goals, one of which included PHR registration. Other payment models were linked to claiming virtual encounters. For example, one organization did not charge patients for advice given via the PHR but paid physicians $1 per message up to $2000 per year. Another paid their physicians $5 for every secure email up to their first 100, and further bonus if they responded to a certain level of secure emails.

Others said that paying for performance or by service process wasn’t necessary in their organization. Instead, benchmarking clinic enrolment or providing prize incentives, such as baseball tickets or pizza parties for top performing clinics, was highly successful.

‘When it’s all said and done the single most effective tool that we’ve been able to use is peer pressure. ’

One interviewee said the best encouragement came from the chief executive officer (CEO) who brought a cake to the clinic that had the most PHR registrations. This acknowledgement was noted as important for culture change and recognition that the PHR was a priority for the organization.

**Advice for successful implementation**

We asked interviewees for their advice to new organizations seeking to implement a PHR. Their answers were remarkably homogeneous (illustrative quotes are presented in table 3). First, they advised implementing a PHR ‘for the right reasons’, serving intrinsic drivers for improving the quality of care rather than extrinsic regulatory drivers (table 3A). Second, ensure governance structures are established and give due diligence regarding patient safety, privacy and security, planning the workflow, and timeliness of response (table 3B). Given the natural inertia to change, risk aversion, and the need for institutional, patient and provider learning, several interviewees suggested an incremental approach. In other words, don’t offer everything, all at once but start with some basic functionalities and extend the range over time (table 3C). While all reported initial provider concerns, the reality of implementation was easier than anticipated, and associated with overwhelming positive feedback from patients and from (most) physicians, who found this form of communication ‘just saved time’. The major time saver was losing the ‘telephone tag’ and automatic documentation of patient-provider asynchronous communications (table 3D). Lastly, salient advice was that implementing a PHR is not an IT project. Instead it should be viewed as an operational and culture change project with an IT component (table 3E).

**DISCUSSION**

We evaluated the organizational strategies reported by interviewees working in 16 US healthcare institutions who were leaders in PHR use and identified what they believed were key to promoting patient and provider uptake of PHRs. Most of the organizations had instituted a PHR because the technology reflected their vision of patient care delivery. Multi-media communications in the community and at places of healthcare contact were used to build patient awareness and create patient demand. To facilitate provider uptake and acceptance, institutions addressed organizational culture, communication and policies, work process redesign, staff training, and IT support, and monitored adoption. However, despite the onset of accountable care organizations (ACOs) and patient centered medical homes, there appeared to be no explicit link between PHR uptake and the health of their attributed population base, or high risk population management. PHR uptake has not been routinely examined to determine who is using the service, patient preference for other forms of communication, and whether there are subgroups that require differing strategies to adopt this technology.

Studies evaluating PHRs to date have mostly focused on the uptake, utilization, and patient outcomes as a result of implementation, patient behavioral models for adoption, or mechanisms and context within which patient outcomes could be achieved through PHRs. Most have provided little data on how the PHR was implemented. Literature on institutional strategies for PHR implementation is sparse. The Canadian Committee for Patient Accessible Health Records also highlighted the importance of physician champions.
In addition, they stated that a culture shift was necessary that acknowledges a patient’s fundamental right to access their medical records and that successful change management requires an acceptance of the costs of change. This was in terms of both the institution willing to cover the financial costs and providers recognizing that workload may well increase in the short term (but hopefully improve in the long run). Other studies focusing on implementation of e-health tools, such as electronic medical records physician order entry or clinical decision support tools, provide more information. Implementation success appears to be reliant on ensuring that the technical aspects of a health IT tool are considered alongside the social, cultural, and organizational aspects of the healthcare environment. Heeks et al contended that the greater the personal and organizational change required by an IT system, the greater the risk of failure. The system has to fit with the user’s values and any change needs to happen in small enough steps to be achievable by the majority.31,32 Taking this socio-technical perspective necessitates organizations to understand their processes of care and how people interact with each other, so they can work out how a new system will best fit in. Consistent with this notion, our study

<table>
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<tr>
<th>Advice</th>
<th>Quotes from interviewees</th>
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<tbody>
<tr>
<td>A. Implement a PHR according to intrinsic drivers for quality of care</td>
<td>‘...we crafted a key designing principle that from day one, we said, “The Medical Record belongs to the patient and we are merely the custodian of it.” We don’t want the patient to have any better, worse or more limited experience online than they would if they called, if they were seen in clinic or anything else. So making sure that the spirit of why you’re doing it is right, not just because, you know, Meaningful Use is forcing you down the path.’</td>
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<tr>
<td>B. Ensure governance structures are established</td>
<td>‘...work out before anybody does anything, the governing structure. We cannot over-emphasize that enough. So who makes the decisions? Patients have to be included in that decision making process...some representative patients from representative practices, you need some representative providers from representative practices, and those providers are not just doctors. They’re doctors, nurses, whatever, and...think of the rules of how and what needs to get done, and what’s the revision process?’</td>
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<tr>
<td>C. Start with an incremental approach</td>
<td>‘...start very simple and then just begin with it. And let things happen organically and let it expand as the organization and the patients are ready for it. There is no perfect system, everything’s gonna have flaws. I think there’s so many things that they won’t learn until they actually just start doing it...You can think about it in a room for twelve months and not learn as much as you could in one week of actually doing it.’</td>
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<tr>
<td>D. Make workload easier</td>
<td>‘[the PHR] was a big win for the doctors, [such as] getting back to patients about their lab test results; the phone tag was horrible. So this became a big satisfier with docs because you could just basically either release normal stuff or you can annotate the lab and say, “This is normal, and keep doing what we’re doing”. Or, “Hey okay, why don’t you go up on this pill”.’</td>
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<td>E. Treat as an operational project with an IT component</td>
<td>‘This is 80% operational and only 20% technical. Too many organizations consider this a technical or an IT project. This is an operational project that has a significant IT component. And it has to be thought about from the operational perspective first. So do the analysis of your workflows and make sure to engage your clinics by hospital leadership and most importantly, your physician leaders. Get your physician leaders on board first so that they can be advocates to the rests of the physicians. Cause that’s gonna be your hardest group to sell.’</td>
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PHR, personal health records.
certainly found that work process redesign occurring before and during PHR implementation was a major factor in creating ‘wins’ for the healthcare team as well as overall organizational efficiencies. Indeed if clinician engagement is the number one strategy for successful portal uptake, then benefits must accrue for the healthcare team as well as the patient. In a recent review, Ludwick and Doucette found staff training, project management, establishing standards, and strong leadership were also success factors.29 However, the review acknowledged teamwork and the value of multidisciplinary perspectives. In our study, while powerful sponsors were critical, so too was the inclusion on the project team of frontline staff with an interest in PHRs. This was reported by many of the interviewees as important given their in-depth knowledge of work processes such as appointments and triaging phone calls that are not generally part of medical roles.

There are several organizational change models and theories that have been used to assist the planning and phasing of change.34 Many of the findings in our study are reflected in Kotter’s eight step change management model35 that includes creating a sense of urgency, creating a guiding coalition, developing a change vision, communicating the vision, empowering broad-based action, generating short term wins, never letting up, and incorporating the changes into the culture. Certainly the PHR is now an integral part of daily operational process in each of the participating organizations—the speed of the integration expressed as a surprise to some.

Strengths of this research include the summary from 16 leading US healthcare organizations. These strategies were employed largely before the influence of Meaningful Use requirements,2 and they can provide a guide for other organizations in order to maximize the value from a PHR investment. However, while the study generated many factors that interviewees thought were critical, some may have been missed as many implemented their PHRs over 6 years ago. Furthermore, most of the organizations were large integrated delivery systems with complex operations and salaried staff. Many of these organizations would have had the power to make changes to the PHR deployed and streamline work processes. Therefore they would be able to improve ease of use and perceived usefulness which, according to the Technology Acceptance Model, is critical for both patients and providers.36,37 Another weakness, which is related, is the inability to contrast any of these findings with information from organizations that were unsuccessful or less successful. Therefore transferability/generalizability of our findings may be limited to these types of institutions and different strategies may be needed in other settings, especially for small primary care providers in a fee-for-service business model.38

An additional weakness was the inability to get an in-depth understanding of the cultural and behavioral problems experienced in these organizations,39 and where resistance to change was most felt at the time of implementation. Finally, in this study we focused on HIT leaders’ and clinical directors’ perspectives. Future studies on the patient’s perspective, with and without chronic disease, will be important in determining the relative impact of each strategy for PHR adoption.

CONCLUSIONS
We evaluated the PHR adoption strategies taken by leading healthcare organizations for implementing PHRs and maximizing their uptake. We found that PHR implementation was an operational project catalyzed by an IT tool that required marked organizational culture change. These organizations leaned heavily on a vision, embedded the PHR into usual practice, ensured alignment with clinical workflow, and leveraged the PHR to make physician workload easier. However, the value of PHRs for an organization’s attributed high risk populations is unlikely to be realized without monitoring the populations served, who might benefit the most, and who is being left behind.

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CONTRIBUTORS
SW led the study, conducted the data collection, and was responsible for drafts of the manuscript. All authors contributed to the design, analysis, and interpretation, writing, and final approval of the manuscript, and agree to be accountable for all aspects of the work.

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COMPETING INTERESTS
Outside of the submitted work, SW has received grants from the Health Research Council of New Zealand, Roche Diagnostics Ltd, and the National Heart Foundation of New Zealand. DWB reports personal fees from SEA Medical and Zynx, and grants and personal fees from EarlySense. In addition DWB has a patent on decision support software licensed to Medicalis with royalties. MD completed a 2013 summer internship at InterSystems Corporation.

ETHICS APPROVAL
Partners Institutional Review Board.

PROVENANCE AND PEER REVIEW
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REFERENCES


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