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RESEARCH ARTICLE

The Journey through Grief: Insights from a Qualitative Study of Electronic Health Record Implementation

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Objective. To improve understanding of facilitators of EHR system implementation, paying particular attention to opportunities to maximize physician adoption and effective deployment.

Data Sources/Study Setting. Primary data collected from 47 physician and 35 administrative key informants from six U.S. health care organizations identified because of purported success with EHR implementation.

Study Design. We conducted interviews and focus groups in an extensive qualitative study.

Data Collection/Extraction Methods. Verbatim transcripts were analyzed both deductively and inductively using the constant comparative method.

Principal Findings. Conceptualizing EHR adoption as loss through the lens of Kübler-Ross's five stages of grief model may help individuals and organizations more effectively orient to the challenge of change. Coupled with Kotter's eight-step change management framework, we offer a structure to facilitate organizations' movement through the EHR implementation journey. Combining insights from these frameworks, we identify 10 EHR strategies that can help address EHR implementation barriers.

Conclusions. Loss is one part of change often overlooked. Addressing it directly and compassionately can potentially facilitate the EHR implementation journey. We offer a summarized list of deployment strategies that are sensitive to these issues to support physician transition to new technologies that will bring value to clinical practice.

Key Words. Electronic health records, medical informatics, information systems, information management/systems/computerization ambulatory/physician office health information technology, EHR/EMR implementation, organizational change, change management, stages of grief

The use of full or partial electronic health record (EHR) systems—also referred to as electronic medical records (EMRs)—in physicians' offices is increasing (Burt, Hing, and Woodwell 2006; Hsiao et al. 2011). However, by

2012, only 40 percent of providers used a fully functional system, or “Basic EHR,” defined by the U.S. National Center for Health Statistics to include patient history and demographics, patient problem lists, physician clinical notes, comprehensive lists of patients’ medications and allergies, computerized orders for prescriptions, and the ability to view laboratory and imaging results electronically (Blumenthal, DesRoches, and Donelan 2008; Hsiao et al. 2011). Meanwhile, only 27 percent of physicians intending to apply for meaningful use incentives reported having EHR systems in place with capabilities to actually meet the Stage 1 core objectives for meaningful use (Hsiao et al. 2011; Kokkonen et al. 2013). These facts suggest that transitioning from paper records to an EHR cannot be equated with complete integration of an EHR into the care process.

The slow pace of adoption and integration of fully functional EHR systems has typically been attributed to “barriers” at both the organizational and physician levels (Burt, Hing, and Woodwell 2006; DesRoches et al. 2008; Lorenzi et al. 2009; Hing, Hall, and Ashman 2010; Greiver et al. 2011; Kokkonen et al. 2013). Eight main categories of physician barriers were identified by a 2010 review of 22 research articles on barriers to EHR acceptance: financial, technical, time, psychological, social, legal, organizational, and change process (Boonstra and Broekhuis 2010). These physician barriers align to barriers identified at the organization level (Ash and Bates 2005; Lorenzi et al. 2009; Rao et al. 2011), and both types are well-understood by practitioners and researchers. Some view these barriers as the focal point of interventions—removing them will accelerate EHR adoption (Miller and Sim 2004; DesRoches et al. 2008; Boonstra and Broekhuis 2010). An alternative framing, however, is of EHR adoption as a change process that is slowed due to participant resistance (Ford et al. 2009).

In this article, we propose that EHR adoption is contingent not just on removing barriers but on addressing the change processes involved—at both the individual and organizational levels. Given this framing, there is a particular need to explore contextual factors related to the process of change to provide evidence-based guidance during implementation, a focus that is

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relatively absent from the current discourse on EHR adoption (Boonstra and Broekhuis 2010; Greiver et al. 2011; McAlearney et al. 2012). Our paper fills this gap by examining administrators' and physicians' perspectives about how adoption and implementation of an EHR system can be facilitated. Our research objective, shared with study participants, was to improve our collective understanding of EHR implementation strategies to advance the adoption and implementation of ambulatory EHRs, paying particular attention to opportunities to maximize physician adoption and use of such systems.

STUDY DESIGN AND METHODS

Site Selection

Our study was designed to learn from the experiences of physicians and administrators who had participated in EHR system implementations that had been widely reputed to be successful. We used several criteria to generate an initial list of successful sites including receipt of the Healthcare Information Management Systems Society Annual "Davies" Award for Ambulatory EHRs within the past 5 years combined with recognition as a "Most Wired" hospital by the *Hospital and Health Network's* annual benchmark survey. We then solicited feedback from a project advisory committee comprised of representatives from industry and academia with expertise in HIT implementation to allow the research team to finalize the list. From this list of 10 potential study sites, we refined our list to address considerations of geographic and organizational variability. Six health systems across the United States made our final study sample, with consideration of alternate sites given to allow for expansion if insufficient observed replication of themes across sites failed to allow the team to draw conclusions, consistent with our goal of saturation and the standards of case study research (Yin 2009). All target study sites agreed to participate in our research.

Data Collection and Study Participants

We conducted a total of 35 in-person or telephone interviews with administrative key informants, including organizational leaders and managers, information systems leaders and professionals, and staff (Table 1 provides a count of study participants by role). Interviews consisted of a series of open-ended questions and lasted 30–60 minutes. In addition, we held six focus groups comprised of 47 generalist and specialist physicians—physicians in practice,

Table 1: Study Participants, by Role

<i>Administrative Participants</i>	<i>Number</i>	<i>Physician Participants</i>	<i>Number</i>
Leaders/managers	18	Physicians in practice (attending and private practice physicians)	26
Information technology (IT) professionals and leaders	13	Physicians in training (interns, residents)	17
Staff	4	Physician leaders	4
Total	35	Total	47

physicians in training, and physician leaders. We conducted focus groups using a standardized focus group guide that covered topics related to EHR implementation and use. Focus groups lasted 60–90 minutes. All interviews and focus groups were recorded and transcribed verbatim. Our data collection process also included a concomitant assessment of interview and focus group transcripts and discussion of preliminary findings to permit probing for new concepts and ensure that we reached saturation in data collection, consistent with standards for rigorous qualitative research (Strauss and Corbin 1998). This study was approved by the institutional review board of The Ohio State University. No informant approached for this study refused to participate.

Analysis

We used a grounded theory approach including both inductive and deductive methods to analyze interview and focus group data. A coding team, established by the lead investigator, created a preliminary coding dictionary defining broad categories of findings from the transcripts. This coding dictionary included the code “physician perspective,” defined as physician’s views on how an EHR changes their work and/or relationship with patients. We further classified data in this broad code into themes, following Conostas’s constant comparison methods (Conostas 1992). Coders met periodically throughout the coding process to ensure consistency in coding and review any new codes or themes that emerged, consistent with a grounded theory approach (Glaser and Strauss 1967; Strauss and Corbin 1998). We used the *Atlas.ti* software program (Scientific Software Development 2008) to support the coding process. The themes associated with change principles that we describe here emerged from this iterative approach to coding and analysis.

STUDY FINDINGS

Through our analyses we found three important opportunities to facilitate physicians' adoption and use of EHR systems in clinical practice. These opportunities involved (1) conceptualizing EHR adoption as personal change through a metaphor of loss and grief; (2) framing EHR implementation using an organizational change management model; and (3) mapping these two approaches together to develop 10 EHR deployment strategies. These deployment strategies can serve a useful function to management by linking specific interventions to each of the stages of grief. In the following sections we describe each of these opportunities in further detail and offer evidence from our analyses to support these findings.

Conceptualizing EHR Adoption as Personal Change Involving Loss

In synthesizing our findings about physicians' personal reactions to EHR implementation, we identified a theme of *loss* among the participants. One administrator characterized the transition to an EHR as "the death of their old record into their new record," while physicians often commented on the changes needed for them to use the new system. As one physician explained, "So in the good old days, well there's a chart. You pick it up and we all knew how to flip the tabs and you know we could deal with that."

The extant literature provides examples of these types of professional losses inherent in organizational change, including the loss of valued expert knowledge when new technology replaces old, and the loss of power when organizations are restructured (Harvey 2002). We found that both of these types of loss were noted by the physician interviewees when describing the EHR introduction and implementation. For instance, physicians described the EHR introduction as "really so destructive to my flow and my interaction with my patients," while another was concerned about how to work with the new system: "How do I access these old records, the x-rays, all this stuff? And order my labs and then discharge them and do the follow-up letter?" At the same time, administrators reported that physicians often clung to the past because they did not want to lose their sense of expertise and comfort with the way they did things. One administrator noted, "They're really trying to do their old work in an EHR, as opposed to innovating, using that new functionality to innovate and change the way they practice."

With respect to loss of power, two areas of power loss were of particular note among study participants. First, interviewees noted that having junior physicians more comfortable with computers than the average established physician involved a shift in power. As one physician explained, “It can turn the whole relationship we have upside down. The old model was senior physicians have more knowledge, more wisdom, more experience and they taught the younger . . . And an EMR in my mind flips it on its head because it’s no longer simply about experience, right?” A second area of power loss was in the ability for physicians to shift their work to others. With the EHR implemented, physicians were now required to use the computers and input their orders rather than delegating these tasks to junior physicians or nurses. An IT director described how this played out in one EHR implementation describing, “We had some doctors who said, ‘I don’t need to do that, my nurse is going to do that for me.’” At another site an interviewee explained, “In the old world, the nurse was in getting the vitals on a sticky and the doc was outside looking at the chart refreshing him or herself,” thus not needing to spend time recording the vitals. Similarly, an administrator noted, “Well, in the old world if a doc did a visit and scribbled, forgot to sign his or her name and it just went back in the shelf and we’d bill for it,” but now the physician has to spend time signing records and ensuring compliance.

We propose that this theme of loss is associated with a sense of grief, akin to the type of employee grief identified in studies of corporate layoffs (Vickers 2009; Davey, Fearon, and McLaughlin 2013). This led us to conceptualize the EHR adoption process using Elisabeth Kübler-Ross’s model categorizing the five stages of grief (Kübler-Ross and Kessler 2005). While admittedly not as profoundly personal as dealing with the loss of a loved one, framing EHR adoption in terms of loss and grief was surprisingly appropriate for characterizing the change process required for physicians to adopt and use an EHR system, and our data supported this classification. Specifically, we found that the five stages of Kübler-Ross’s model—denial, anger, bargaining, depression, and acceptance—can be articulated as required phases of personal change for physicians adopting and integrating an EHR system. We describe this characterization further next and provide additional supporting evidence in Table 2, presenting representative quotations from both physician and administrator study participants.

Denial. Kübler-Ross identifies the first stage of grief, denial, as one where individuals may experience shock and/or feel overwhelmed. In the context of

Table 2: Conceptualizing EHR Adoption as Personal Change Involving Loss

<i>Stages of Grief</i> (Kübler-Ross, 1969)	<i>Representative Quotations Characterizing Stage of Grief in Change Process</i>	<i>Administrators' Comments</i>
Denial		
● Shock		● "The docs were just overwhelmed. Not just the docs, but the clinical staff could easily be overwhelmed with that stuff."
● Feeling overwhelmed	● "It's been probably one of the most unsettling things that I've seen for physicians throughout our entire system." ● "... it was an overwhelming amount of information."	● "There was no gray; it was very black and white and that was shocking and upsetting at first."
Anger		
● Underlying pain	● "It was a fairly painful process getting on top of it." ● "By the time you've actually done all that, your patient encounter is half way over and then it is not even worth documenting in the patient room."	● "We're asking the clinical people to do more and more . . . so you end up having very highly paid, high thought process people doing data entry—bad idea. And that's painful for a lot of people." ● "... anger on the part of physicians that they actually had to type and document and place orders and do histories and physicals themselves and meds."

continued

Table 2. *Continued*

<i>Representative Quotations Characterizing Stage of Grief in Change Process</i>	
<i>Stages of Grief (Kübler-Ross, 1969)</i>	<i>Administrators' Comments</i>
Bargaining ● Negotiation	<p style="text-align: center;"><i>Physicians' Comments</i></p> <ul style="list-style-type: none"> ● "Everyone has mixed feelings. I mean there are a few that have all favorable but even those people acknowledge the issues and the problems that we have." ● "And I went all the way to even less personal . . . why do they need that cover letter? It's obvious I saw the patient. Just give them the progress note. They can read the note."
Depression ● Feeling empty	<ul style="list-style-type: none"> ● "The first 2 weeks, I could have quit medicine. It was really so destructive to my flow and my interaction with my patients." ● "It was too much information . . . and then all of the sudden, the next day, . . . we were thrown in the clinics . . . which stressed me out for like 2 months!"
	<ul style="list-style-type: none"> ● ". . . the ones that have already the little negative thoughts in their heads—that it's not going to work, I am not going to be as productive, I don't want to share my notes." ● "We did lose physicians over this . . . There were doctors that left because they could not adapt . . . they did not know how to type."
	<ul style="list-style-type: none"> ● "We can't make them feel bad, they'll start crying. I had a provider cry on me once." ● ". . . they just want to go back to doing work the way they used to do work."

continued

Table 2. *Continued*

<i>Representative Quotations Characterizing Stage of Grief in Change Process</i>	
<i>Physicians' Comments</i>	<i>Administrators' Comments</i>
<p>Stages of Grief (Kübler-Ross, 1969)</p> <p>Acceptance</p> <ul style="list-style-type: none"> ● Of changed reality ● New reality is permanent reality 	<ul style="list-style-type: none"> ● “When you have somebody who is a very medically complex patient who sees a lot of different specialists, who has a lot of different outpatient visits and those clinics are within the EMR system and you can really use it to the best of its ability . . . You are able to have all of that at your fingertips and . . . so at its best, I think that it is a great system and it really . . . it changes the way that you manage people.” ● “. . . the ability to share information within our practice, very critical information that somebody knows something that somebody else needs to know, the ability to shift work to where it can be done better or more efficiently like off-site of to the right person. Definitely the ability to follow things we couldn't in the past because we can't do it on paper.”
	<ul style="list-style-type: none"> ● “[They say] . . . while I used to have to take a stack of charts home to review them, now I can just dial in from home and do all of that stuff before I even come in.” ● “Actually our biggest critic is . . . the staunchest advocate of the EMR.”

EHR implementation, we characterized this stage from comments indicating physicians struggle with loss. For instance, as one interviewee described of physicians' reactions to the EHR implementation, "They were just overwhelmed," while another noted, "the culture shock for implementation is significant." An information technology professional reflected about physicians in this early phase explaining, "In every provider meeting I go to, there is someone who says 'Leave it alone, I know what I am doing now.'" Also important was the notion that this denial stage had to be acknowledged and addressed. One administrator commented, "If you don't do it fast, people say, 'Hmm, they'll never get to me. This is a passing fad. A couple years from now they'll have a new CEO and they'll have something else they'll be working on.'"

Anger. The second stage of grief requires acknowledgment of the underlying pain. As one administrator explained of the implementation process, "It's so painful for some of these folks that you could pay them anything and they wouldn't do it. And when they start doing it, it's painful." Another explained how the physicians "were angry for the first 3 months." More specifically, one interviewee described "anger on the part of physicians that they actually had to type and document and place orders and do histories and physicals themselves and meds." Physicians acknowledged this anger and frustration. As one lamented, "So, I don't know what has changed in the last couple months that I'm no longer allowed to give verbal orders to my MAs [medical assistants]. But now it's more focused on just put the order in instead of actually listening to what I say. That's a little frustrating." Another physician commented about this shared anger sentiment explaining, "It's because we're going from 'thinking folks' to 'data-entry folks' and that is painful on so many levels."

Bargaining. The third stage of grief, bargaining, encompasses aspects of negotiation and attempts to construct trade-offs to avoid the change or legitimate contingency approaches. An obvious bargaining approach indicating implementation failure for an individual was seen when physicians chose to retire rather than adopt a new EHR system. One administrator explained, "The ones who were close to retirement were like 'You know, I'm not going through this pain, it's been nice, see ya.'" When physicians outwardly adopted the EHR, several found ways to avoid actually interacting with the system. As one physician leader reflected, "The whole myth was that it was this fully wired,

integrated system. But in fact what happened was the attendings weren't actually touching the computers. So, they could ask . . . go find a resident 'pull this up for me,' whatever. So they didn't actually have to touch the computers." In confirmation of this approach, a different physician proudly reported, "I don't know how to place an order. I don't even know what my password is." Physicians also manifested this contingency behavior as one where they acknowledged the positive potential of the EHR system, but only when described along with the drawbacks of the system. One physician noted, "I think that we all recognize the positives of the system and we all recognize the frustrations perhaps with the implementation or the roll-out or the difficulty in getting things done that may be more inefficient now than they were when we had a paper system," thus offering the positive comment only in conjunction with negative feedback as well.

Depression. The depression stage of grief, when individuals deal with feelings of hopelessness and inadequacy, was evident in both physicians' comments and administrators' reports about how new users would cry and express a desire to either quit their present position or retire. As one physician recalled, "I started crying and could not quit! . . . I would click in my sleep and I mean, to that point . . . I had nightmares of clicking and clicking and not getting it right." Administrators recognized this stage and further described it as a low point. One noted, "You really have to make up a celebration, because during the first couple of days everyone is on the high, by about day three they are crying." Another administrator explained of this stage, "Yeah they haven't gotten to the point where, 'Ooh!' Like the light bulb hasn't quite come off of some of them for what the system can do for them." Interviewees' descriptions of this stage reflected how physicians indeed felt disheartened and empty, and did not suggest any sense of hope for the future.

Acceptance. In contrast, the fifth stage of grief, acceptance, was characterized in this context by comments indicating realistic acceptance of a changed reality—and, ideally, a better future that included the EHR system. As a physician leader described of this phase, "Now it's not something that somebody has to do to make sure it happens. It happens naturally in our system so we get less errors and much better flow. And in paper, you just can't physically do things in paper. It just is the way it is." An administrator summarized, "Basically it was, 'Well, this is going to take much more time out of my day, it's clunky, I'm

not having eye contact with my patient' and now it's, 'Wow this is great!' . . . And plus, having the disease registry piece really has made a difference in . . . you know, you focus on diabetes, COPD [chronic obstructive pulmonary disease], cardiovascular disease and you can tell each provider's patients exactly how they stand relative to the quality indicators."

However, not all users truly accepted the change. As one administrator noted, "They're really trying to do their old work in an EMR, as opposed to innovating, using that new functionality to innovate and change the way they practice." Similarly, not all physician participants appeared convinced. One complained, "I'm not having eye contact with my patient," while another begrudgingly commented, "I think for the most part, physicians are adaptable to change. I guess." Administrators characterized this lack of acceptance by describing remaining issues they needed to address. As one noted, "Now one of the challenges we have post go-live is for them to really take ownership of this application and to have it become part of their culture there and part of their work world." Another explained, "We're going to reinvest in you whether you like it or not because we don't want garbage in. We want a pretty high standard for our EMR here and so we want to make sure you're contributing all the material to the EMR." Thus, while the acceptance phase appeared an appropriate way to characterize EHR implementation, similar to acceptance of grief, the time frame for acceptance of the EHR was not predictable, and there was considerable variability in users' perspectives about the new system.

Framing EHR Implementation Using an Organizational Change Management Model

From an organizational perspective, change principles can also be applied to help guide EHR implementation and facilitate adoption and use of the EHR system. We identified Kotter's eight-step change framework as a good example of a change management model that appears to resonate among those challenged by the need to promote change in health care organizations (Kotter 1995). In Table 3 we show how study participants' suggestions for facilitating EHR implementation can be conceptualized using Kotter's framework, presenting representative quotes to characterize each of the eight change steps.

Facilitating EHR Implementation Using Change Principles

Combining insights from the individual and organizational change models, we identified 10 EHR deployment strategies based on study participants'

Table 3: Framing EHR Implementation as Organizational Change Management

<i>Kotler's Eight-Steps Guiding Change Management (1995)</i>	<i>Representative Quotations Describing Facilitators of EHR Implementation Characterized as Steps Toward Change</i>
1. Establish a sense of urgency	<ul style="list-style-type: none"> ● "I mean it was really part of the burning platform . . . just to try to get people to recognize that status quo was not acceptable. We couldn't keep doing what we were doing and sustain it." ● "So you've got to go quickly and you've got to make it the exclusive focus if you really have a transformational type situation."
2. Form a powerful guiding coalition	<ul style="list-style-type: none"> ● "I think that there's a leadership . . . the administration and the medical staff leadership and with the support of the boards." ● "We had 12 physician leaders that were all part of the physician coalition to lead the vision from a medical staff perspective."
3. Create a vision	<ul style="list-style-type: none"> ● "We established a vision in our EHR adoption and set out a plan about 5 years ago." ● "So that vision is what's really driving all of our attention and willingness to go along with this."
4. Communicate the vision	<ul style="list-style-type: none"> ● "This was the focus and that's all we talked about and everybody's goals and compensation were all aligned to what the vision was." ● "So, if management is saying this is why we are doing it, this is the reason we are doing it, this is how much money we are going to make, this is how much we are going to save, etc., and these people are going to act on our behalf to do that, then that's the way to be successful."
5. Empower others to act on the vision	<ul style="list-style-type: none"> ● "... strong steering committee, strong work group meetings, and then as you're working through the workflow at the clinic level, making sure that participation, people are showing up, that they're doing their tasks . . . strong project management." ● "We took anything else of major substance off of the plate that cut across institutional lines."

continued

Table 3. *Continued*

<i>Kotler's Eight-Steps Guiding Change Management (1995)</i>	<i>Representative Quotations Describing Facilitators of EHR Implementation Characterized as Steps Toward Change</i>
6. Plan for and create short-term wins	<ul style="list-style-type: none"> ● "So when we started doing this roll out on medications for patients and we were able to demonstrate reductions in medication errors and you get some of those 'wow' moments where a nurse is barcoding this medication before they administer it and it comes up in the electronic medical record that there could be this fatal complication, you literally save a life there." ● "It was about the wins . . . at one of our practices, there were seven docs . . . A doc was on call, got a call over the weekend from a hospital in [Name], for a patient that wasn't his, and had to do with [a problem] . . . And this doc was able to bring up the chart and see everything that he needed to see to give the answer. So needless to say, he was now less resistant to [the EHR, thinking.] 'this might be worth it.'"
7. Consolidate improvements and produce still more change	<ul style="list-style-type: none"> ● "Once you started producing results and getting where you wanted to get to, then you could start being a little more focused on sub-areas or things that you needed to get at and you could start bringing other key goals for the institution back into play." ● "The next phase is to go 'ok, now you got the basics, now, how can we leverage some of this? What's taking you the most time?' And stay with them to work with them to get processes in the whole practice and then get them rolling in the whole practice."
8. Institutionalize new approaches	<ul style="list-style-type: none"> ● "Now it's not something that somebody has to do to make sure it happens. It happens naturally in our system so we get less errors and much better flow and in paper, you just can't physically do things in paper. It just is the way it is." ● "I think it's now an absolute part of the culture and who we are and how we do things here."

recommendations to facilitate EHR adoption: (1) Manage expectations; (2) Make the case for quality; (3) Recruit champions; (4) Communicate; (5) Acknowledge that it is a painful transition; (6) Provide good training; (7) Improve functionality, when possible; (8) Acknowledge competing priorities; (9) Allow time to adapt to the new system; and (10) Promote a better, but changed, future. Below we further describe the development of these strategies from our analyses, using the first strategy as an example.

The first deployment strategy, “manage expectations,” was based on recommendations made by both physicians and administrators in the form of suggestions about how to improve the EHR implementation process. For instance, one interviewee reflected about how the EHR was introduced to physicians in the context of their work by being straightforward about the EHR system and goals for its introduction. He explained that the message to physicians was: “We bought this system so that we would have good reporting, so that we would have the integration between different practices and between the hospital facilities. This is not about making your life easier.” This message provided a good example of how “managing expectations” was reportedly a facilitator of the EHR implementation process. Then, in our analysis process considering individual change principles, we mapped this “manage expectations” strategy to the “denial” stage of grief because this facilitator reflected the need to acknowledge the change expected in spite of individuals’ reluctance to change, and the hope that this recognition could help physicians move out of the denial stage. We also mapped this recommendation to the organizational change management step of “establishing a sense of urgency” because this strategy emphasizes the need for all participants involved in EHR implementation to acknowledge the reality of the change and move forward with the change process.

As another example, the recommendation to “acknowledge the pain” of the transition to a new EHR system was supported by numerous comments from both physician and administrative study participants. One commented, “This is absolutely an essential step and painful process to go through,” and another lamented that “There is nothing that we can do in preparation that will make it pain free.” Framing these comments using change principles, we mapped this facilitator to the “anger” stage of personal change and the “communicate the vision” stage of organizational change. Given that the anger stage of grief explicitly notes that this stage involves acknowledging the “underlying pain,” numerous comments from interviewees describing pain made this matching process straightforward. Similarly, because participants typically acknowledged the pain in the

context of communicating the changes involved in realizing a new vision involving an EHR system, considering this recommendation as part of the organizational “communicating the vision” stage of change also seemed appropriate. In Table 4, we provide evidence about how we categorized participants’ recommended facilitators by change stage, using both the personal and organizational change models to categorize each of the 10 EHR deployment strategies.

DISCUSSION

EHR Implementation and the Challenges of Change

For physicians, the introduction and implementation of an EHR system involves changes in medical practice and behaviors that are reportedly difficult. These difficulties may stem in part from logistical issues involved in training and preparation for implementation. However, our study suggests that personal factors associated with the process of change may also play a part, including the loss of professional content knowledge and/or the loss of power. Paying attention to these personal factors may improve the EHR implementation process.

The five stages of grief proposed by Elisabeth Kübler-Ross (1969) provided an approach to categorizing steps involved in the personal change required as physicians adopt and develop the capacity to fully use a new EHR system. Kübler-Ross’s model was originally developed in 1970 to characterize the process of accepting one’s own death and grieving the loss of a loved one. Through the decades, Kübler-Ross’s framework has emerged as an important model of the personal change process (Linney 1999), both for consideration of changes in one’s home, such as divorce (Kruk 1991), and for organizational change (Perlman and Takacs 1990; Grant 1996; Elrod and Tippett 2002).

Kübler-Ross’s model has been applied to change in many professional contexts, including employee reactions to layoffs and corporate closures (Blau 2008; Davey, Fearon, and McLaughlin 2013), organization changes required for staff nurses in an oncology practice (Schoolfield and Orduña 1994), change in secondary and university educational systems (Adrienne 2003; Zell 2003), and corporate compliance (Boerner 2010). Within the professional context, the Kübler-Ross model has been discussed as a way to identify and reduce the stress associated with organizational change (Vakola and Nikolaou 2005; Critchley 2012). In 1996

Table 4: Characterizing Ten EHR Deployment Strategies: Linking Recommended Facilitators of EHR Implementation to Stages of Personal and Organizational Change

<i>EHR Deployment Strategy</i>	<i>Link to Personal Change Stage</i>	<i>Link to Organizational Change Stage</i>	<i>Representative Quotations Characterizing Recommended Facilitator of EHR Implementation</i>
1. Manage expectations	Denial stage	Establish a sense of urgency	<ul style="list-style-type: none"> ● “And I just . . . I guess someone needs to sit them down and sort of say, ‘The party’s over,’ in a way. You kind of have to.” ● “. . . try and set expectations as much as you can upfront.” ● “. . . building an understanding of what it really is going to take I think is really essential.”
2. Make the case for quality	Denial stage	Create a vision	<ul style="list-style-type: none"> ● “There is a vision that people just buy into that it’s better if it’s an electronic record. It’s more accessible, there are alerts for safety and you can make sure people get their mammograms and get their whatever blood tests for diabetes and whatever else you need to remind them to do and remind the doctors to do.” ● “The Institute of Medicine Report says we’re killing people, we’ve got to get on this.” ● “I’m trying to help improve the quality of care given to the patients and if you have to go abstract paper charts, it’s just not going to get done.”
3. Recruit champions	Anger stage	Form a powerful guiding coalition	<ul style="list-style-type: none"> ● “Managing the culture, it is what it is. The most you can do is find, like a good physician champion, find a strong practice leader.” ● “The key role there was to identify physician champions: physicians who were incredible individuals but who also knew that the status quo was unacceptable . . . And to develop additional physician champions to help provide the leadership to get there for all the doctors.”

continued

Table 4. *Continued*

<i>EHR Deployment Strategy</i>	<i>Link to Personal Change Stage</i>	<i>Link to Organizational Change Stage</i>	<i>Representative Quotations Characterizing Recommended Facilitator of EHR Implementation</i>
4. Communicate	Anger stage	Communicate the vision	<ul style="list-style-type: none"> ● “There is a vision that people just buy into that it’s better if it’s an electronic record. It’s more accessible, there are alerts for safety and you can make sure people get their mammograms and get their whatever blood tests for diabetes and whatever else you need to remind them to do and remind the doctors to do.” ● “You can’t deny that because you’re not making their job easier, and you’re not saving them time.” ● “Any major change requires a communication.”
5. Acknowledge that it is a painful transition	Anger stage	Communicate the vision	<ul style="list-style-type: none"> ● “It was a painful transition and some of that might be because it’s just hard to go from paper charts to electronic no matter what you do.” ● “So don’t even try to sell that [efficiencies gained argument] out of the door because the first 6 months are so painful . . .” ● “They just complain, you know. But they will never, they never regret it. They always say it’s great but they just go kicking and screaming through the whole thing.”

continued

Table 4. *Continued*

<i>EHR Deployment Strategy</i>	<i>Link to Personal Change Stage</i>	<i>Link to Organizational Change Stage</i>	<i>Representative Quotations Characterizing Recommended Facilitator of EHR Implementation</i>
6. Provide good training	Bargaining stage	Empower others to act	<ul style="list-style-type: none"> ● “We’ll give you a great experience and in fact we’ll throw in . . . we threw in some CMEs and a briefcase and stuff like that. . . .” ● “We’ll give you this great stuff and you have to turn around and use it and then we’re going to reinvest in you whether you like it or not.” ● “When you’re training this, you’re teaching several things: you’re teaching new software, you’re teaching new workflow, and you’re dealing with all their anxieties about their job, their own personal abilities to learn this, their fear of losing their job.” ● “One of the things that we have learned is that sometimes we need to go and give computer training to people before we even start the EMR. We have to have the trainers go out and show them how to use a mouse and show them how to you know, do things like that.”
7. Improve functionality, when possible	Bargaining stage	Plan for and create short-term wins	<ul style="list-style-type: none"> ● “Once you’re in it and they’re going through all that pain, you’re trying to show them little things to improve it.” ● “It just may not be possible to create smart phrases for some of the messy psychosocial issues that we deal with in primary care. But some of them could be created I think.” ● “Despite my own frustrations with the speed of our current system and the mistakes that that then causes, I think it is still a good step in the right direction.”

continued

Table 4. *Continued*

<i>EHR Deployment Strategy</i>	<i>Link to Personal Change Stage</i>	<i>Link to Organizational Change Stage</i>	<i>Representative Quotations Characterizing Recommended Facilitator of EHR Implementation</i>
8. Acknowledge competing priorities	Bargaining stage	Plan for and create short-term wins	<ul style="list-style-type: none"> ● “You know people are already doing multiple things and have multiple responsibilities and so they totally . . . it’s very hard to explain to them how much time and energy it’s going to take to do an ambulatory implementation and so they really need to understand what that commitment is.” ● “Just because we changed to an electronic environment, doesn’t mean the rest of the world did. So you’re living in a partially electronic world, you’re living in a partially paper world.” ● “They have a life and a job that they want to do, don’t make them decide. You know what I mean? Because they chose health care, they didn’t choose technology. So come in . . . and work with them!”
9. Allow time to adapt	Depression stage	Consolidate improvements and produce still more change	<ul style="list-style-type: none"> ● “Get comfortable with that and then we’ll add other things.” ● “You can frame it that this is about the system of care, it’s how we take care of patients, not about just you and making your life miserable with this one little piece so you feel a little bit better about it.” ● “And recognize, tell them that upfront: this is a significant change in how you work and don’t expect to do it tomorrow. Don’t get angry that you can’t operate this way. It’ll take time.” ● “It wasn’t a, ‘let’s look at the data coming out of it at the same time’ that was more of a well, when we get to that it’ll be just gravy.”

continued

Table 4. *Continued*

<i>EHR Deployment Strategy</i>	<i>Link to Personal Change Stage</i>	<i>Link to Organizational Change Stage</i>	<i>Representative Quotations Characterizing Recommended Facilitator of EHR Implementation</i>
10. Promote a better, but changed, future	Acceptance stage	Institutionalize new approaches	<ul style="list-style-type: none"> ● “It touched every individual in the organization and changed every process. Everything that was always done by paper and how we’ve done it and documented it and reported on it and all of the metrics that we used and all the ways we did it touched literally every individual.” ● “Today, you couldn’t go backwards. You could not take the system out of there. People are used to it. They can’t imagine not having the benefits of the electronic medical record like you can find the chart. You can work from home. Patients can self-schedule or get prescriptions renewed electronically. I mean all the benefits that are there for the physicians. You just can’t go back.” ● “I don’t know how you can practice medicine in the 21st century without electronic medical records. I don’t know how you can practice safe, cost-effective medicine without this tool.”

Henderson-Loney noted that “Kübler-Ross’s griefwork model provides a guide for supervisors to manage the emotional response of their team members to organizational change” (Henderson-Loney 1996). Thus, prior work can support the appropriateness of framing EHR adoption using this personal change model, and acknowledging that the EHR implementation process may indeed involve aspects of grief given the changes required.

Moreover, in light of the well-documented barriers to EHR implementation, researchers have suggested applying organizational change models to the EHR adoption process (Bonner et al. 2010; Boonstra and Broekhuis 2010; Greiver et al. 2011), and our research findings support this proposition. Our study provides evidence that each of the eight steps of Kotter’s (1995) change management model could help frame the EHR implementation process, and we found multiple examples of how those steps resonated with study participants’ comments about dealing with EHR adoption. While the application of Kotter’s model in health care is not unprecedented (Fernandez and Rainey 2006; Campbell 2008; Tsuyuki and Schindel 2008), its consistency and fit with our study data provides evidence for its applicability in ambulatory EHR implementation that has not been previously demonstrated.

Perhaps most striking was our finding that the recommendations study participants listed as key facilitators of the EHR implementation process could be framed by both the personal and organizational change models. In the gray literature guiding business and management executives, both Kübler-Ross’s stages of grief and Kotter’s change principles have been referenced as useful frameworks for understanding change implementation (Chapman 2012). Our explicit categorization of recommended facilitators into EHR deployment strategies by change stage, however, provides additional support for the salience of these models in EHR implementation.

Implications for Management and Policy

Change can have powerful benefits for care, cost, and populations. Yet change remains difficult for both individuals and organizations. By considering and explicitly acknowledging the personal change processes involved in EHR adoption in light of individual change principles, we may be better able to allow people to cope with the pressure to change in ways similar to how we allow people to grieve when they are dealing with loss. Furthermore, by guiding required organizational change processes using a change management

framework, organizations may be better able to motivate, lead, and succeed with EHR adoption as a major change for the organization. Under the right conditions, implementation can lead people and organizations to champion change, but under the wrong ones, they may come to champion the way things used to be.

Addressing the implications of our results specifically, managers can use the deployment strategies we present to intervene to mitigate EHR implementation problems and potentially move employees to the next stage of change. At the level of individual physician intervention, managers can identify the stage of change the employee is dealing with and implement a strategy from the left-hand column shown in Table 4. When a physician is determined to be in the Anger stage, for example, a corresponding deployment strategy is to *acknowledge that it's a painful transition*, thereby helping this individual to move past anger in the change process. At the level of the organization, however, managers can be guided by Kotter's framework and select the EHR deployment strategy that corresponds to the stage of change appropriate for the organization in its transition to use of a fully functional EHR system.

Study Limitations

One important limitation of this study is the small number of organizations involved. Given the resource constraints of qualitative studies, there are significant barriers to large-scale studies. Future work can include the development of surveys based on this research to explore and validate our findings in large samples. An additional limitation is the inability of our study to link EHR implementation strategies to either clinical or financial outcomes. However, previous research has established the link between successful EHR implementation and positive patient and provider outcomes (Shekelle, Morton, and Keeler 2006; Bonner et al. 2010; Adler-Milstein et al. 2013; Bar-Dayyan et al. 2013); we selected the health systems in our study based on these accepted measures of successful implementation, thus attempting to mitigate this potential limitation.

Future Work

The EHR adoption process is often described as a journey. We submit that practice transformation efforts such as the introduction of the patient-centered medical home model and meaningful use requirements have

created an unexpected and unexplored frontier. To this point, much of physicians' focus had been on the care of patients within an incident framework of episodic care. The health care delivery system is now asking physicians to "dance on shifting sands"—to meet moving targets, dispose of practice habits, build new data collection protocols, and learn new skills. In the context of EHR implementation, further work is needed to understand this complex system change from the perspective of physicians on the front line. The theoretical models highlighted by our work can serve as frameworks to organize future EHR implementation efforts and study their impact on physicians.

CONCLUSION

For both the organization and the individual, the introduction, adoption, implementation, and use of EHRs involve change. As the changes involved are both personal and organizational, our findings suggest that change principles can help clarify the steps involved and facilitate physicians' adoption and optimal use of EHR systems. Framing EHR implementation in stages using the lenses of both personal and organizational change models may be useful to physicians struggling to progress through the required steps of personal change, as well as to organizations challenged to maximize physicians' adoption and use of the new system.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of this article:

Appendix SA1: Author Matrix.