



Published in final edited form as:

GSTF J Media Commun. 2014 February ; 1(2): 23–27. doi:10.5176/2335-6618_1.2.16.

Technology and Health Care: Efficiency, Frustration, and Disconnect in the Transition to Electronic Medical Records

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Abstract

This study investigates one medical facility's transition to electronic medical records (becoming “paperless”). We utilized face-to-face interviews to investigate the transition process with one implementer (the vice president of the medical facility) and three stakeholders from one of the four offices (an assistant office manager, a nurse, and a medical technician). We discuss the dominant themes of efficiency, frustration, and disconnect as well as conclusions and implications.

Keywords

electronic medical records; organizational change; provider-patient communication; technology

At times it appears as if the only stability 21st century organizations have is the guarantee of change. Change may seem like a long overdue (sometimes unwanted) relative's visit or a constant but subtle companion. Regardless, eventually change invades almost every type of organization [1][2]. This is especially true of health care organizations, which are encountering structural changes such as the transition toward more managed care (e.g., HMO), technological changes such as the infiltration of “telehealth” through mediated channels of communication [3], and the transition from paper to electronic medical records (EMRs). This study focuses on one medical facility as it struggles to become “paperless.”

We conducted this research at a large cardiology practice with four branches in coastal NJ. The practice consists of 20 cardiologists and 85 staff members. These individuals have been experiencing multiple changes as they transition toward electronic medical record (EMR) keeping. For example, in 2002 the practice changed from the Medic Multi program used primarily for scheduling and billing to the Next Generation (Next Gen) computer program. The Next Gen program can be used for both patient scheduling and for EMR keeping. During the initial stages of transition, Next Gen was used primarily for scheduling and billing purposes, however, in 2005 the practice began preparing to go “live” with the EMR function of the Next Gen program. On July 1st 2006, vice president of the practice (the implementer of the transition) introduced a timetable that set a goal of being completely “live” with EMRs by July 2007. This goal was later amended to a more “realistic plan” of being fully functioning by January 2008.

Face-to-face interviews to investigate the transition process were conducted with one implementer (the vice president of MCC) and three stakeholders from one of the four offices (an assistant office manager, a nurse, and a medical technician). Informants provided written consent to be interviewed and for the researchers to audiotape the interview sessions. The researchers followed a semistructured interview protocol that allowed for additional probing. Each researcher interviewed two informants with each session lasting approximately 30 minutes. The audiotapes were later transcribed. We used thematic coding to analyze the data. We immersed ourselves in the data through line-by-line reading and rereading of interview transcripts [4]. We conducted opening coding in which we identified domains and assigned each domain a conceptual code [5]. We identified three domains of (a) efficiency, uniformity, and accessibility, (b) frustration, and (c) disconnect.

I. Efficiency, Uniformity, and Accessibility

Although several themes emerged from the interviews, one overarching theme concerned the potential gain of adopting an EMR system: that is, that making a change from the traditional paper charts to EMRs will allow remote access to medical records at any time. Although each person used different terminology to express this idea, it was clear that this was his/her understanding of the *reason* for the change. For instance, the medical technician said that EMRs would implement “efficiency” and ease of information retrieval especially for the doctors (e.g., “... electronically they’ll have that information”). The nurse responded that EMRs were being implemented “for uniformity ... that everyone has more access to the same material...” She defined “everyone” as “file clerks, the front desk, medical records, medical techs, the nurses, the doctors.” The assistant office manager echoed the previous responses suggesting that going paperless will be “wonderful” especially for the doctors because “they’ll be able to access the patient’s charts from anywhere.” The implementer explained that because EMRs allow virtual connections, “you can go to any office and get the info at any time.” The implementer continued to describe how EMRs would enable efficiency, uniformity, and accessibility when any of the practice’s patients go to the hospital because their medical information will be more readily accessible. Participants described current difficulties in accessing a patient’s chart compounded by having four office locations and different hours (e.g., charts may be filed in anyone of four offices, and on weekends). The implementer explained how transitioning to EMRs will ameliorate these complications of paper charts because with a few clicks (and passwords) he can “access them right there.” Thus, our interviewees stated that efficiency, accessibility, and uniformity were the overall reasons why the practice was implementing EMRs.

II. Frustration

The second theme that emerged from our interviews was frustration as a result of the process of transitioning to EMRs. Part of these frustrations is related to the amount of time the transition consumed. The practice made a major change in 2002 with the purchase of a new computer system. Through the interviews, we uncovered appraisals of “glitches” and talk of abandoning the process since the initial change implementation in 2002. These feelings appear exacerbated by elements of the process not directly related to the practice’s struggle to transition to EMRs. For example, the computer program required updates in 2006 that

added to staff and nurses' feelings of frustration with the process. We also discovered that the implementer's and the employees' frustrations stemmed from different sources.

The implementer's frustrations were focused on individuals, specifically several doctors who had to be "sold on" the idea of EMRs. This frustration is related to the perception of others that transitioning to EMRs is optional. The implementer explained that "I had to convince them-convince them that you know what? It's not going away!" He added that "five years from now" insurance companies would be mandating that private practices use EMRs.

In contrast, the employees' frustrations appeared to be focused more on structural details of the implementation process. When asked what was causing the delay in fully transitioning to EMRs, one interviewee laughingly replied, "I really don't know. I'm sure staffing is a problem. They need to find people who have the extra time to physically scan hundreds upon thousands of charts." Another employee mentioned problems with entering medications into the system (described in more detail in the next section), and a third described how difficult it can be with "20 doctors in the practice" who all have to agree on the design of the new templates (i.e., electronic assessments for stress tests and other procedures).

Thus, frustration with the process of transitioning to EMRs was evident from both employees and the implementer, but seemed to be experienced differently. The theme of frustration may be especially important in consideration of the progress of the EMR transition at the current time. According to the implementer, it has been "a few years in the making," but they are "hopefully" going live on July 1st (2007). This goal was later amended to full EMR functioning by January 2008. In our follow-up communication with the facility, we learned that they did not go "live" with a second EMR computer program (Greenway) until September 2011. As of July 2013, the practice was about 65% transitioned to EMRs (although some individual offices were as much as 80% transitioned).

III. Disconnect

The final theme of "difference" or "disconnect" was present in all four interviews. Interviewees expressed feelings of disconnect in three subthemes (a) features of the system, (b), orientation to the system, and (c) dissemination of information. The theme of disconnect is both consistent across interviewees (in the case of the system's features) as well as representative of a rift between implementer and stakeholders (in the case of orientation and dissemination). We describe the system features first.

A. Features of the System

All four informants expressed disconnect between their original impressions of the Next Gen computer program and EMR system (e.g., the functions it would provide, the time it would take to adapt) and the reality of implementing it. The strain of this disconnect was most clearly apparent during discussion of the transition from paper to electronic medical records, specifically the process of uploading the existing (paper) medical records. For example, the employees expressed surprise and dismay at the bulk and complexity of the task of converting the paper records to electronic records. These complications were

compounded by the length of time some patients had been visiting the practice. For example, interviewees expressed surprise at the sheer volume of materials they needed to input both in terms of number of individual clients ("... we got about a millimeter into it because there were just so many papers-") and the size of the files for some clients ("... some of our patients have been coming to us since the '70s,"). Further, interviewees expressed confusion and dismay about which records to input, "... after a month of scanning... what to scan and what not to scan became a problem" and how to orient with the system. In addition, employees expressed unpreparedness for the tedious nature of the task of converting the paper records to electronic records. For example, the assistant office manager explained, "I don't think we have enough knowledge of how difficult it was going to be ... a good understanding of the amount of work that was going to go into creating this paperless system and just the logistics of it..." Even the implementer agreed that a disadvantage of the whole process is "it takes a long time" to enter the patient information the first time because of features of the system itself. These expectancy violations added to the overall frustration interviewees expressed.

Further, interviewees expressed inability to anticipate the complexity of the Next Gen EMR system itself, specifically the way medications are entered into the system. For example, two of the employees elaborated on the number of options available when inputting a particular type of aspirin. In contrast, when recording this type information about medicine in a paper chart, the person entering the information only had to record the aspirin dosage (e.g., 81 versus 325 mg/day). The computer system mandates that users input a particular brand of aspirin (e.g., Bayer, St. Joseph's, Ecotrin, etc.) before they are able to move to the next part of the records in the system. In the perspectives of some interviewees, these functions did not contribute to the utility of the EMR system, and instead contributed to frustration. This is where we discovered disconnection in orientation to the system between the stakeholders and the implementer.

B. Orientation to the System

Some interviewees, specifically, the stakeholders (assistant office manager, nurse, medical technician) expressed frustration with the Next Gen EMR system's complexity and mandatory functions. In contrast, the implementer described these particular functions of the system as "benefits," highlighting the anticipated improvements the system forces. For example, the implementer indicated that entering medication specifics (e.g., specific brand of aspirin) would result in "better patient care." He described the contrast to paper records where individuals can omit information, "... electronic medical records make you put all the data in. You can't go to the next step unless everything is in there." Thus, the implementer and the stakeholder demonstrated disconnect between their appraisals of the features of the EMR computer program.

We also uncovered disconnect in the macro and micro view of the interviewees. The implementer describes and considers a macro view, the "big picture" - the benefits for everyone once the system is "live," but the stakeholders are struggling in the micro to get the system to a point where they can go live. This demonstrates a rift as the implementer seems solely focused on the eventual benefits of the system, while simultaneously he is less attuned

to the process and the plight of the stakeholders working to implement the EMR transition. For example, the implementer explained that “it's it's it's gonna help. So they're - this staff likes it.” In the first theme the stakeholders expressed understanding of the reasons underlying the necessity and benefit of transitioning to EMRs, however, they did not, in the interviews, express “liking” it. For example, one stakeholder when reflecting on the process of transitioning to the Next Gen EMR system revealed that “it, it's been very dif- like I said, it's been difficult for us ... “

One possible explanation for this disconnect is the implementer's apparent focus more on the doctors in the practice than the office staff. When responding to the interview questions, the implementer consistently referred first to the doctors in the practice. He only referenced the other stakeholders (office staff, nurses, technicians) peripherally or when the interviewer specifically asked about them. For example, the implementer discusses the advantages of the system (in lines 36-71 of the transcript) and only refers to the “girls” (the office staff) twice—once to lament the magnitude of record entry, and once when referring to the printout the system generates for patients, “ ... without even telling the girls anything I talked about. ... “ The final element of the theme of disconnect considered dissemination of information.

C. Dissemination

The final theme explains disconnect in the method information about the EMR system itself and the process of transitioning to EMRs was disseminated. Overall, the stakeholders we interviewed expressed a high degree of uncertainty about the Next Gen system itself, the impetus to transition to EMRs, the time line of the transition to EMRs, and what to expect from transitioning to EMRs. For example, as one stakeholder stated, “I'm not sure if they went and had like a presentation ... “, and indicated her reactions to the transition to EMRs saying “I wasn't sure what to expect.” In contrast, the implementer indicated that one of his strengths in the transition from paper to electronic medical records was dissemination of information. For example, he indicated that the best strategy for communication of change is to “ ... set them up for what's coming down the pike. Don't hit them between the eyes at the last minute ... “ The implementer also indicates that he “gets things out in advance” by sending messages to multiple email addresses as well as cellular phones. However, it appears that although the doctors in the practice receive these messages, the office staff, nurses, technicians, and other stakeholders do not. Thus, we uncovered disconnect between to whom the information was disseminated as well as how stakeholders interpreted and appraised the disseminated information.

IV. Conclusion

This paper investigated the transition to EMRs in one medical practice by exploring different viewpoints of the change process through interviews. We uncovered three themes: (a) efficiency, uniformity, and accessibility, (b) frustration, and (c) and disconnect.

The medical office stakeholders and the EMR implementer expressed that the transition to EMRs should facilitate “efficiency,” “uniformity,” and better “accessibility” to patients’ records. Interviewees also expressed understanding of the long term goal(s) of transitioning to EMRs, and that once the transition is complete it will improve office functioning as well

as patient care. However, disconnect exists between the implementer's and stakeholders' perceptions of features of, and orientation to, the EMR system as well as information dissemination, which fuels frustration. Employees expressed concern with the volume of charts to be scanned, tedious nature and rigidity of the system in information entry (e.g., specificity of medications), and other challenges related to task-related aspects of the transition (some of which center around expectancy violations). Employees also reported confusion and uncertainty, and expressed a lack of information disseminated. In contrast, although the implementer acknowledged these problems, he seemed to dismiss them as small obstacles in the way of the "big picture." He also concentrated information dissemination on the doctors in the practice instead of the other employees (office staff, nurses, and technicians).

In our investigation the implementer was also the *innovator* or person "to sense or seize a new opportunity." The EMR transition implementer was the one who initiated the "process of departing from the organization's established routines" [6]. The experiences of this medical practice are consistent with prior research, for example, Kanter [6] suggests that the innovation process itself may be uncertain, knowledge-intensive, controversial, and may cross boundaries. Further, there are 19 additional partners in this practice and the implementer is not solely responsible for communicating with employees about the planned changes (in this case, the transition to EMRs). Features such as this may also contribute to frustration and dissatisfaction with information dissemination.

One theoretical framework that may contribute to our understanding of disconnect in the transition to EMRs relates to the technology itself. The *technological frame* is described as "a way to characterize the interpretations or mental models that employees and other stakeholders have about specific technologies (p. 244) " [7]. Technological frames are further distinguished as "beliefs about the nature of the technology (what the technology is), the organization's technology strategy (why managers chose to implement it), and technology-in-use (how to use the technology to create various changes in work processes, norms, incentives and culture)" (p. 244) [7]. Although the stakeholders and the implementer seem to share similar perceptions about "what the technology is" and "why the managers chose to implement it," it is possible that some of the disconnect stems from the employees' struggle with how the technology will change the way they do their jobs.

It was apparent that the employees and implementers would continue to struggle over the weeks and months following the interviews as they prepared go "live." These struggles were likely exasperated as the goal of being live continued to shift from July 2007, to January 2008, to finally attaining that goal in September 2011 after transitioning through three different computer programs (from Medic Multi, to Next Generation, to Greenway). At present they are about 65% transitioned to EMR and "not crazy about the product but it's working."

Our research suggests that medical practices navigating (or considering navigating) the transition from paper to paperless may reduce frustration by disseminating information about the EMR system (both features and orientation) to all members of the organization, especially those responsible for the tasks associated with transitioning to EMRs in order to

reduce uncertainty. Medical practices may also be aware of the long and tedious process of becoming fully “electronic” (considering the facility we interviewed is not 100% transitioned more than a decade after introducing the EMR computer program) in an effort to reduce negative expectancy violation. More broadly, our study suggests that implementers or technology related change may benefit from understanding and exploration of the technological frames from which their employees operate. Organizational change is not a process that stakeholders can simply “ride out.” Until a new paradigm eclipses the current one, organizations will continue to reflect the societal mantra of constant change. Scholars must continue to respond to the often-lamented need for theoretical development of planned organizational change [8][9][10].

Biography



Maria C. Checton, PhD, is an assistant professor, Graduate Program in Health Care Management, College of Saint Elizabeth, Morristown, NJ, USA. Her research and clinical interests focus on interpersonal communication in health contexts. Recent publications include “Beyond Initial Disclosure: The Role of Prognosis and Symptom Uncertainty in Patterns of Disclosure in Relationships” in *Health Communication* (2012); “I Tell My Partner Everything ... (or Not): Patients’ Perceptions of Sharing Heart-Related Information with their Partner” in the *Journal of Family Nursing* (2014), and “Patients’ and Partners’ Perspectives of Chronic Illness and Its Management” in *Families, Systems, & Health: The Journal of Collaborative Family Healthcare* (2012, with K. Greene, K. Magsamen-Conrad, & M. K. Venetis).



Dr. Kate Magsamen-Conrad studies health and interpersonal communication. She is especially interested in applied projects partnering with community groups to augment the potential for grant funding. Her program of research draws on traditions of research in interpersonal and health/risk communication, relationships, psychology, and persuasion. Her relational research broadly concentrates on how interpersonal communication affects personal, relational, and health outcomes. Her applied work focuses on the development and implementation of interpersonal and persuasion theory-based health interventions, for example a Brief Disclosure Intervention (BDI) for HIV+ individuals that comes out of her dissertation research. Within her information management research, she focuses on health

related disclosure decision-making and the mechanisms through which researchers can apply theory in order to improve health. Dr. MC (as she is known to her students) tends to work in interdisciplinary research teams and utilizes both interpersonal (e.g., the BDI), persuasion (e.g., the National Institute of Drug Abuse, NTDA funded Youth Message Development project, YMD, working with high school students), and combination approaches (e.g., the Intergenerational Communication Intervention, ICI, working with college students and older adults). Dr. MC has numerous conference papers including several top paper awards, several refereed publications, and several manuscripts currently in revise and resubmit, review, or preparation. She is the Pion a grant under review at the National Institutes of Health (National Institute of Aging), and another under review at the Department of Education; she is a Co-Ion a grant under review at NIDA.

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