

Organizational Strategies for the Adoption of Electronic Medical Records:

Toward an Understanding of Outcome Variation
in Nursing Homes

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“[T]he economic recovery plan I’m proposing will help modernize our health care system—and that won’t just save jobs, it will save lives. We will make sure that every doctor’s office and hospital in this country is using cutting edge technology and electronic medical records so that we can cut red tape, prevent medical mistakes, and help save billions of dollars each year.”

Barack Obama
December 6, 2008

An important element in President-Elect Obama’s economic stimulus proposal is his plan to invest a significant proportion of federal dollars in installing electronic medical records (EMR) in U.S. healthcare institutions. In emphasizing the need for EMR, the President-Elect is following the advice of numerous healthcare experts who have pointed out that the healthcare sector lags behind other industries in the use of computer technology. They believe the widespread use of EMR would help reduce medical errors, control the costs of healthcare, and lead to significant improvements in the quality of healthcare Americans receive.

In this paper we present preliminary results of an ongoing study of the introduction of EMR in twenty nursing homes in the New York City area. Although most observers believe EMR holds great promise for the improvement of healthcare, in fact recent studies have found mixed evidence regarding the effect of EMR on patient outcomes. The evidence we have gathered to date in our New York nursing home study suggests that whether EMR has beneficial effects on the costs and quality of healthcare depends very much on the purposes and objectives nursing home managers and administrators intend to achieve through its use. That is, management strategy and style, we believe, strongly influences healthcare outcomes associated with technological innovation.

Motives for Using EMR

Several factors motivate proponents of the use of EMR. One is certainly the ever-rising cost of healthcare in the U.S. The estimated cost of healthcare in the U.S. in 2008 would reach \$2.4 trillion, or about \$7,900 per U.S. resident (Kaiser Family Foundation, 2008). Despite many efforts to control the cost of healthcare, for more than thirty years the annual rate of increase in healthcare costs has almost always been above the overall rate of inflation and has often soared into double digits. It is projected that in 2016 the U.S. will spend over \$4.1 trillion on healthcare, or \$12,782 per U.S. resident. If present trends continue, by that year healthcare will consume 20 percent of gross domestic product (Kaiser Family Foundation, 2007). Many experts blame inefficient and (often) inaccurate recordkeeping for a significant proportion of healthcare inflation.

A second factor motivating EMR proponents is evidence that medical errors result in the death of thousands of Americans each year. For example, the Institute of Medicine estimated that 98,000 Americans die each year as a result of medical errors (Kohn, et al., 2000). Recently the Institute estimated that 1.5 million Americans are harmed each year as a result of medication errors. This study estimated that medication errors cost hospitals \$3.5 billion each year (Aspden et al, 2007). One study showed that medical errors may be the third leading cause of death in the United States (Starfield, 2000).

EMR has been viewed as a major part of the solution to both the quality and cost of healthcare. Improving documentation procedures and standardizing care plans will, it is maintained, reduce error rates, save time and money, and enhance medical care. Some scholars have estimated that the combined efficiency and safety savings of EMR range between \$142 and \$371 billion a year (Hillestad, et al., 2005).

Other experts believe the use of EMR will enhance the quality of employment relations. By reducing, and possibly eliminating, paperwork, EMR should free up time that caregivers can then devote to their patients. The reallocation of staff effort away from paperwork and toward patient care should not only improve the quality of healthcare but also make healthcare jobs more interesting and fulfilling, thereby increasing job satisfaction and reducing turnover. High turnover of healthcare workers, particularly nurses, is a common problem in the industry, and reducing turnover can lead to both lower costs and higher quality care (for a recent review of the causes and consequences of nurse turnover in the healthcare industry see Hayes et al., 2006).

Some Challenges in Using EMR

Despite high expectations about the benefits of EMR, recent studies have found mixed evidence regarding the effect of EMR on patient care outcomes. For example, Linder and his co-authors examined seventeen quality care indicators in ambulatory medical units and found that the adoption of EMR had a significant positive effect on only two of them; one quality indicator was negatively affected (Linder et al., 2007).^{iv}

Some healthcare experts are skeptical about EMR's effect on the quality of patient care because they believe the standardization required by computer technology deprives caregivers of the opportunity to tailor treatment to the needs of their patients. EMR may not allow the flexibility that high-quality healthcare requires.

Some stakeholders in the healthcare sector are also leery of the claims that EMR should have positive effects on job satisfaction and retention. Some of the union officials we have encountered in our fieldwork, for example, fear that EMR, rather than freeing up time for caregivers to spend with patients, will simply lead to healthcare institutions

reducing the size of their staff. In fact, previous research on EMR has largely ignored the effects of this technology on employment-related outcomes as well as the link between employment relations and the quality of care. The absence of research that linked the adoption of EMR to changes in the workplace and, in turn, linked changes in the workplace to changes in the quality of care was the principal factor underlying our nursing home project.

The New York Nursing Home Demonstration Project

In the New York City region, 1199SEIU United Healthcare Workers East (1199SEIU) represents employees in approximately 170 for-profit and not-for-profit nursing homes^v. The vast majority of the employees represented by 1199SEIU in these nursing homes are certified nursing assistants (CNAs) and licensed practical nurses (LPNs), the principal staff members at the point of care in nursing homes. Some years ago 1199SEIU and the nursing homes negotiated a provision in their collective bargaining agreement establishing the so-called “Quality Care Oversight Committee” (QCOC). The QCOC is the tri-partite committee, consisting of a nursing home industry representative, a labor representative, and a neutral who handles the vast majority of disputes arising in this bargaining unit.

In March of 2006, the arbitrator (and chair of the QCOC) heard a grievance arising out of the failure of the parties to implement their agreement to move ahead on a number of initiatives intended to increase the quality of resident care, including the adoption of EMR and other technologies. In his award, the arbitrator, among other things, mandated the parties to adhere to their agreement, and subsequently he worked with industry and union leaders to devise a strategy for funding and implementing EMR.

During the spring of 2006, the parties jointly approached the New York State Legislature to lobby for funds to support the adoption of EMR in a sample of nursing homes. The Legislature authorized a grant of \$9 million to support the adoption and implementation of EMR in a sample of nursing homes in the New York City area; Governor Pataki signed the bill passed by the Legislature. Subsequently, the QCOC supervised a rigorous process for selecting a vendor as well as the twenty homes that would receive the technology. By late spring of 2007 the technology was introduced in three homes, and by February 2008 SigmaCare had “gone live” in most of the twenty homes.

The Evaluation Methodology

The QCOC, reflecting the views of the nursing home operators and the union, believed that an outside, impartial evaluation was a necessary component of the project. The QCOC awarded grants to researchers at Cornell to conduct an evaluation of the effects of the introduction of EMR on both employment relations and the quality of resident care.^{vi}

We need to acknowledge some of the unique features of the New York nursing home project. First, it is almost certainly the case that the majority of participating homes would not have adopted EMR were it not for the substantial subsidy provided by the State. Many, if not most of them, would have invested in the technology out of their own funds within the foreseeable future, but it is impossible to say to what extent the State subsidy accelerated their plans. We also believe some of the participating homes would have delayed the decision to invest in EMR indefinitely (or until they were mandated to do so). Also, it is obvious that the calculus underlying the decision to invest

in EMR is quite different in for-profit homes than it is in public or not-for-profit homes. Second, the EMR project resulted from a partnership between the nursing home operators and 1199SEIU. In an industry in which most nursing home facilities in the U.S. remain nonunion, the presence of the union exerts a very strong effect on the character and nature of this project. By joining forces to lobby for support from the State Legislature, the parties were able to obtain a grant that neither could have obtained by lobbying on its own. Moreover, it is likely that the union-operator partnership significantly facilitated the introduction of EMR in each of the participating homes (although this is a proposition we are examining in our evaluation). Third, the fact that this project was undertaken in the New York City region gives it a uniqueness that distinguishes it from other regions of the nation. For example, several of the participating homes are operated by and for the Jewish community. Also, virtually all of the workers in the homes are minorities; a high proportion frontline staff is either Hispanic or from the Caribbean.

In sum, although we believe several of the unique features of the New York project (particularly the union role) provide us with an opportunity to evaluate dimensions that have been ignored in previous studies; we acknowledge that the uniqueness of the project possibly limits the generalization of our findings.

The part of our evaluation that focuses on the workplace examines the effect of EMR on five types of employment and labor relations variables: (1) recruitment and retention, (2) job satisfaction, (3) communication, (4) resistance to change and conflict, and (5) labor-management relations. Our research design combines both quantitative and qualitative dimensions. For our quantitative evaluation we use a quasi-experimental design that incorporates fifteen homes that received the technology and five control

homes that did not. We have conducted a baseline telephone survey of direct caregivers (RNs, LPNs, CNAs, therapists, etc.) in the fifteen “treatment” homes and the five control homes immediately before the introduction of EMR in the treatment homes. We are currently conducting a follow-up survey in the same homes one year after the introduction of EMR. Across the twenty homes there are approximately 2,500 employees in the occupational categories included in our survey, and in the baseline survey the response rate was just under 50 percent (about 1,240 completed the survey).^{vii}

In this paper we focus on the findings we obtained in the qualitative part of our evaluation. Before the introduction of the technology, we conducted face-to-face interviews in ten of the homes participating in the project. A year later, after the introduction of the technology, we returned to the same ten homes and conducted a new round of interviews, usually with the same interviewees we had interviewed a year earlier. In our field visits, we generally spent at least half a day at each home, and we usually interviewed the administrator of the home, the director of nursing services, the assistant director of nursing services, and several RNs, LPNs, and CNAs. In some cases we were able to interview the owner of the home (who was sometimes the administrator as well). We also tried to interview union delegates at each of the homes. The people we interviewed at each home depended on who happened to be available the day we visited as well as on the cooperation of the top administrators in letting us have access to their staff. Generally speaking, the administrators were very cooperative, and we were able to interview somewhere between eight and twelve respondents at each home.

Toward a Typology of Organizational Strategies for Adopting EMR

If, as the President-Elect and many others have suggested, EMR technology has the potential to address many of the problems in the healthcare sector, why is the empirical evidence so mixed? Is the mixed evidence due to variation in the EMR systems adopted? Is it a product of regional or economic differences? Is it related to differences in caregiver skill levels and their capacity to use the technology effectively? Although these factors, and others, may influence the effectiveness of EMR, our research strongly suggests that variation in EMR effectiveness is a consequence of the divergent goals and objectives motivating organizational adoption of the technology.

One of the advantages of this study is the fact that many of the factors that could potentially contribute to outcome variation are, in fact, naturally controlled. First, the type of technology implemented in each of the ten nursing homes examined in this paper was, for the most part, identical and was provided through the same technology vendor.^{viii} Second, with regard to labor relations, 1199SEIU represents virtually all of the frontline staff (CNAs and LPNs) and each of the ten homes was covered by similar collectively bargained terms and conditions.^{ix} Third, because nine of the ten homes were in the New York City area, we were able to rule out a number of possible external factors that otherwise might explain variation in EMR outcomes.^x Thus, if we observe variation in the outcomes associated with the adoption of EMR in our sample of homes, its origins would likely be due to internal organizational factors, such as organizational and workforce characteristics.

Our interviews at each of the homes revealed a surprising degree of divergence across the institutions in how the homes intended to apply the technology and, more

importantly, what benefits they expected to attain from its implementation. The nursing home administrators we interviewed had very different notions about how they could use the technology to advance specific organizational goals and objectives. In sum, we found three overarching strategies homes pursued in the adoption of EMR: a) a control strategy; b) an efficiency strategy; and c) an empowerment strategy.

Top management in our nursing homes not only had different ideas about how EMR could be used in their organizations, more importantly they had different views on the mechanisms through which EMR would deliver its anticipated benefits. Proponents of EMR have advocated its adoption using a host of rationales ranging from clinical benefits to pure economic savings. However, delivering on the different anticipated outcomes entails a variety of different mechanisms or causal linkages.

One of the possible explanations for the mixed evidence on EMR is that these different mechanisms or linkages have largely been ignored in previous research. For example, one way in which EMR could enhance the quality of resident care is by improving the accuracy of documentation, thereby decreasing medical errors and promoting timely care. Alternatively, another mechanism for improving the quality of care is through the more efficient use of frontline staff time and efforts. Proponents of EMR maintain that its use frees up staff time, allowing them to devote more attention to residents. Whether EMR affects other outcomes (such as financial returns) is likely to depend on precisely which mechanism delivers the benefits, if there are any. Our typology of EMR adoption strategies recognizes that different nursing homes expect EMR to achieve overarching goals and objectives through different mechanisms.

More specifically, our findings suggest that the strategy a nursing home pursues in adopting EMR is strongly related to four organizational characteristics and attributes: a) managerial style; b) the nature of employment relations in the home; c) the nature of labor relations in the home; and d) the extent to which the home has implemented so-called “resident-centered care” or “culture change.” Regarding resident-centered care (or patient-centered care in the hospital setting), over the past two decades, nursing homes have been experimenting with methods to transform the manner in which care is delivered, shifting from a physician and institution focus to one that places the resident and his or her needs at the center of attention (for a recent review of culture change and resident-centered care in nursing homes see Doty, Koren and Sturla, 2008; also see Lopez 2006; Scott et al., 2003; for a more general discussion of patient-centered care see Davis et al., 2004) The adoption of resident-centered care is associated with changes in clinical and employment practices that are geared to increasing resident autonomy and voice as well as the discretion and decision making authority exercised by frontline staff (Doty et al., 2008). In some respects, resident-centered care, which emphasizes teamwork in the delivery of healthcare, parallels the use of high-performance work systems in other organizations (Applebaum et al., 2000; Osterman 2000).

An organization’s EMR adoption strategy can be viewed, according to our framework, as a mediating construct that links organizational characteristics and attributes to outcomes associated with the adoption of EMR.

[Insert Table 1 About Here]

A Control Strategy for Adopting EMR

In our typology the first approach used by homes in our sample for adopting EMR is one that we call the “control” strategy. As shown in Table 1, nursing homes that we included in this category viewed EMR technology through a very specific and relatively narrow lens: they viewed the adoption of EMR as a means of increasing their ability to keep staff under surveillance and impose discipline within the organization. Three of the nursing homes in our sample clearly represented the control approach. These organizations had a more traditional, top-down management style and regarded EMR as an additional tool that would enhance their control and authority over frontline staff and middle managers.

In one home we placed in the control category, the director of nursing services (DNS) described the application of EMR as follows:

I want to know if and when residents are getting their meds. If there's a problem, I want to know which nurses are involved. There's going to be better quality of life because people can be kept in check. If it's not good for them, let them be afraid. The residents' lives are in our hands. Now I will be having more eyes to see what is going on. (Interview with DNS, November 2007)

A DNS in another control home expressed the following view:

Staff is going to be forced to grow up or grow out. If they are not able to learn from their mistakes, employees will need to be held responsible and accountable for such mistakes. (Interview with DNS, July 2007).

Administrators in nursing homes in the control category focused almost exclusively on the ways in which EMR would allow them to receive more accurate and timely information on the activities and behaviors of their staff. Although administrators in all the homes in our study emphasized the importance of frontline staff accountability, the administrators in control homes often spoke of the possibility of using the technology for punitive purposes.

The administrator of a control home discussed the disciplinary benefits of the technology:

If there's a problem, I want to know which nurses are involved. I may give them an in-service, then a warning. If they don't like that, they can find a job somewhere else. (Interview with nursing home administrator, July 2007)

In two of the three control homes, EMR was seen as a tool that could compliment other control mechanisms, such as surveillance cameras installed in the facility. The administrators in these two homes believed that combination of surveillance cameras and EMR would allow them to see what their staff was doing and compare it to the electronic record of what the staff reported they had done. Interestingly, in each of these homes, the administrators paid very little attention to the ways in which EMR might enhance the quality of resident care or improve workplace outcomes, such as recruitment and retention, job satisfaction, and teamwork.

Interviews with frontline staff in the control homes were almost always consistent with our interviews with top administrators. Many of the staff were extremely skeptical about EMR and viewed it as a means by which top management would push accountability down the chain of command. In contrast to nursing homes using the efficiency or empowerment approach, we observed very little enthusiasm or excitement in the control homes about the potential benefits of EMR. The staff focused instead on how EMR would make their work more onerous and less flexible.

We observed three additional organizational characteristics in homes pursuing a control strategy. First, the top-down, authoritarian style used by management meant that administrators made decisions with very little attention paid to input from frontline staff and very little regard for the staff's concerns and needs. Staff in control homes had very

little real “voice,” either on the individual or the collective level. All of the nursing homes in our study were required to establish a joint labor-management committee to oversee the adoption of EMR, but in the control homes the role played by these committees was insignificant.

Second, the control homes were also characterized by very adversarial employment and labor relations. Frontline staff and middle managers in the control homes, in our interviews, painted a portrait of extremely strained employer-employee relations infused with a high level of interpersonal conflict and very low levels of trust. Some of the employees in these homes complained about their working conditions and their treatment by supervisors and administrators. For their part, administrators expressed distrust of their staff and sometimes conveyed disappointment in the commitment of their staff to the organization and its residents. The control homes did not have formalized human resource management practices beyond those required by the collective bargaining agreement.

Our interviews also exposed extremely adversarial labor relations in the control homes. In one of the control homes the union and the administration were locked in an ongoing dispute regarding the use of temporary workers in the home. According to one of the union representatives we interviewed, the use of temporary staff (often called “agency” staff) violated the collective bargaining agreement. In a second control home bargaining unit employees engaged in a job action during the introduction of EMR to protest a number of their unsettled issues, particularly overtime pay. This is the only home in the study in which employees engaged in a job action during the adoption of EMR.

Third, control homes also had a traditional approach to resident care. They showed no signs of adopting resident-centered practices. It is not surprising that nursing homes that viewed EMR as a means of tightening managerial control and authority had little interest in resident-centered care, which features the delegation of authority to residents and staff.

An Efficiency Strategy for Adopting EMR

The nursing homes we included in the efficiency category did not view EMR primarily as a means to increase managerial authority and control. Rather, administrators in these homes focused on the cost savings and financial gains that might be delivered by EMR. Obviously, by definition, all the homes we studied were determined to make a profit. But they differed on the means they believed were most effective in achieving bottom-line results. Control homes believe managerial authority is the best route to profit, but the homes we placed in the efficiency category had a somewhat different view. They believe that seeking efficiencies in the use of staff and in the delivery of healthcare services is the essential ingredient in achieving expected returns on investment. In efficiency homes, administrators viewed EMR as a means of reducing operating costs and increasing Medicare and Medicaid reimbursements. Administrators in the efficiency homes were motivated to adopt EMR by their expectation that the technology would allow them to operate in a more efficient and streamlined fashion.

Top administrators in the efficiency homes seemed to be motivated to adopt EMR by at least two principal linkages or mechanisms. First, these administrators believed EMR would result in significant logistical savings for their organizations. In addition to the reduction in the time clinical staff would need to devote to paperwork, efficiency

oriented administrators thought EMR would alleviate the need for overtime and agency employees. The agreement between the nursing home operators and 1199SEIU prohibited the participating homes from reducing bargaining unit employees as a consequence of the introduction of EMR. But in most of the homes we visited lower-level administrators (who were not in the bargaining unit) were needed to take care of paperwork. In efficiency homes we found that top administrators hoped that EMR would lead to savings in clerical staffing and potentially in staff working hours.^{xi}

Second, administrators in efficiency homes placed a very strong emphasis on the effect EMR adoption would have on their Medicaid and Medicare reimbursements as well as on payments from private insurers. More accurate documentation, many administrators believe, would minimize unreimbursed clinical care, which seems to plague nursing homes as a result of stringent documentation requirements. Furthermore, the use of EMR technology has the potential of alerting physicians and frontline staff to medical care that is not covered under resident insurance plans and might be provided by reimbursable alternatives. For example, SigmaCare immediately indicates when a medication is not covered under the resident's insurance plan and provides a recommended substitute that is. Administrators in these nursing homes also focused on other logistical savings such as cutting down on the use of paper and other office supplies.

One of the administrators in an efficiency home expressed the following view:
The thing that I like about it is that it removes redundancy-- it removes labor, wasted paper, wasted time--when you can pull the information directly out of the system. The system has so much information, just trying to harness it all and make use of it all is at times overwhelming, but at the same time very exciting because it gives you the opportunity to run the organization much more efficiently, and just run the organization in a different way, in a better way. (Interview with nursing home administrator, August 2008)

It is important to note that interviewees in efficiency homes, in contrast to most of the interviewees in control homes, also focused on EMR's potential for improving resident care. Administrators in efficiency homes anticipated that the reduction in medical and medication errors and the increase in the time staff could spend with residents would lead to noticeable improvements in the quality of care. Nevertheless, in our judgment, administrators in efficiency homes placed more emphasis on cost containment than they did on improvements in improving resident care.

In contrast to the focus on surveillance and discipline in control homes, in efficiency homes the focus was on monitoring and learning. Monitoring, in contrast to surveillance, has the purpose of allowing administrators to improve their understanding of organizational inefficiencies, both clinical and logistical, and to learn how to manage an organization more effectively. The use of surveillance rests on the premise that errors are always the fault of the staff; the use of monitoring is based on the idea that staff errors may be the consequence of inadequate supervision, a lack of suitable training, or other problems that cannot be blamed on the caregiver.

An administrator in an efficiency home signified the difference between a single-minded focus on staff responsibility and an approach that recognizes the organizational context of staff performance when she said she hoped that "working with this technology will allow us to reexamine organizational structures and processes so that we can improve as an organization." (Interview with nursing home administrator, July 2007)

Administrators in efficiency homes also differed from administrators in other homes on their management style, approach to employment and labor relations, and their use of resident-centered care. First, efficiency homes did not use an authoritarian

managerial style common to control homes, but instead tended to use a style that we characterize as progressive. Although administrators in these nursing homes did not relinquish their managerial authority or prerogatives, they did establish formal and informal channels for employee voice and input in organizational decisions. For example, we observed that the joint labor-management committees established in efficiency homes typically provided frontline staff with a genuine vehicle through which they could express their concerns and make recommendations. In addition, administrators in these organizations delegated to their supervisors a higher level of discretion and autonomy than we observed in control homes.

Regarding employment relations, we concluded that efficiency homes had what can best be described as a traditional approach. On the one hand, employment relations were not usually as adversarial and contentious as they were in control homes. On the other hand, the efficiency homes exhibited a clear hierarchical differentiation characterized by an arms-length relationship between top management, middle management, and frontline staff.

Labor relations in the efficiency homes were, on the whole, cooperative in nature. Our interviews with both 1199SEIU union representatives and the organization's top managers revealed a healthy, stable, and cooperative relationship between the union and management. Administrators in these nursing homes welcomed the union's input regarding EMR implementation and tried to insure that their concerns were properly addressed. The union, for its part, made a sincere effort to support the nursing home's attempts to "market" the new technology to frontline staff and increase union member

“buy in.” In contrast to the union role in control homes, the union in efficiency homes played an active role in insuring the successful adoption of EMR.

Finally, we characterize the approach efficiency homes took to resident-centered care as somewhere in the middle ground. These homes had not completely adopted a resident-centered philosophy or practice, but they had adopted certain practices associated with resident-centered care. They seemed inclined to grant their residents a greater level of autonomy, for example. In other words, efficiency homes seemed to have a hybrid approach to resident-centered care. Their partial adoption of the resident-centered philosophy, we believe, is consistent with the dual goals of efficiency and improvement in resident care pursued by homes in this category.

An Empowerment Strategy for Adopting EMR

The third EMR adoption strategy in our typology, presented in Table 1 above, is the empowerment approach. In contrast to the control nursing homes that focused primarily on managerial control and the efficiency nursing homes that focused primarily on operational cost containment and improved efficiencies, the three nursing homes that we included in the empowerment category emphasized the link between EMR adoption and employee empowerment, skill development, and broader organizational learning. Administrators in these nursing homes saw a direct link between the introduction of EMR technology and their ability to increase staff involvement in the care of residents and improve employment-related outcomes in an industry where staff satisfaction, recruitment, and retention present ongoing organizational challenges. Empowerment homes sought to leverage the dramatic organizational change associated with the

introduction of new technology to support other organizational initiatives such as the move toward resident-centered care.

The linkage between EMR and organizational outcomes in empowerment homes was based on the belief that the opportunities this technology provided for increased staff skill and knowledge as well as improved employee satisfaction and organizational commitment served as the key mechanism for achieving desired organizational benefits. Administrators spoke of EMR as a tool through which they could connect frontline staff (primarily CNAs) to broader clinical and organizational objectives. These administrators believed EMR had the capacity to increase the skills of frontline staff and give them a better sense of how their work was linked to resident care. EMR technology could connect documentation activities to the care plans for residents. Enhancing skills in this manner, empowerment homes believe, would be likely to lead to increased employee satisfaction and commitment, lower turnover, and better care for residents.

We observed that the three homes we included in the empowerment category had organizational characteristics with respect to management style, employment relations, labor relations, and resident-centered care that differed from the homes we included in the control and efficiency categories. First, managerial style in the empowerment homes was markedly different from the style we encountered at either control or efficiency homes. We characterize the managerial style in empowerment homes as participatory in nature. Administrators at these nursing homes spoke ardently about the need to engage frontline staff and increase opportunities for staff involvement. The participatory approach clearly differentiated these homes from others in an industry that usually places great weight on hierarchical distinctions. Administrators in empowerment homes told us

of their attempts to push for greater levels of discretion and autonomy for all frontline staff. Staff empowerment, they argued, led to enhancements in both resident and employee outcomes. It is not surprising that empowerment homes viewed EMR as a means to support and possibly strengthen their participatory management style.

The administrator in one of the empowerment homes described how he thought EMR would complement other types of organizational restructuring intended to increase autonomy and discretion. He stated:

The technology is an integral part of other changes we are conducting here, such as 'culture change'. We are trying to give people the opportunity to manage themselves, which means giving them the tools to work as best they can in their environment. The technology will serve as an educational tool helping us reach these goals. (Interview with nursing home administrator, July 2007)

Empowerment homes also differed from control and efficiency homes with respect to the way in which they organize work processes. Although interviewees did not use the term explicitly, their approach to employment relations incorporated many of the ideas associated with high-performance work systems (Applebaum et al., 2000). Thus, for example, employees in empowerment homes were given opportunities to participate in decision making, and there was a greater reliance on interdisciplinary teams than we observed in either control or efficiency homes.

In one respect, empowerment homes were similar to efficiency homes: in each of the efficiency homes we visited, there appeared to be a cooperative labor-management relationship along with a high level of trust and reciprocal engagement between the parties. In common with efficiency homes, the adoption of EMR in empowerment homes seemed to be facilitated by labor-management cooperation. Union representatives in these homes encouraged their members to participate actively in the adoption process,

and administrators made a point of addressing union fears and concerns about the effects of the technology on working conditions and staffing levels.

An administrator in an empowerment home expressed his view that the union was essential for the success of the EMR adoption by stating that “the union is actively promoting it; if they were dragging their feet, it’d be dead on arrival. If you don’t have people willing to accept this change, it won’t happen.” (Interview with nursing home administrator, July 2007) The 1199SEIU vice president responsible for this home supported the view that the cooperative labor-management relationship in the home was essential for the success of the EMR implementation. He stated that “this nursing home is ready (for EMR) because of the relationship we have had here. This home is a beacon for labor-management relations.” (Interview with 1199SEIU Nursing Home Division vice president, July 2007) An administrator in another empowerment home viewed the union as a partner in the successful implementation of EMR:

I think the union has been a tremendous help, really, because they were also on board with this 100 percent from the beginning, and I think it would have been difficult if they hadn’t been on board to convince the union members to accept this new technology with a positive kind of approach... I certainly think having their support, without question, has made things go smoother and become successful. (Interview with nursing home administrator, August 2008)

Finally, consistent with their approach to engagement and participation, each of the empowerment homes had adopted most of the practices associated with resident-centered care. Residents were given opportunities to influence the nature of their care, and within limits could determine matters such as the food in their diets and meal times. The physical layout of the nursing home was designed to reduce traditional institutional elements and promote a resident-friendly environment (for a further discussion of resident-centered practices, see Doty et al., 2008). Empowerment homes viewed the

introduction of EMR not only as a means of empowering their frontline staff and supervisors but also as a tool of insuring that they were in fact delivering resident-centered care.

[Insert Table 2 About Here]

EMR Adoption and Organizational Outcomes: Three Propositions

Motivating our nursing home research is the need to address the persistent puzzle about why EMR and other promising health information technologies have not yet been shown to deliver consistent benefits to stakeholders in healthcare organizations. At the heart of this puzzle, we maintain, is the divergent ways in which organizations view the technology and its potential benefits. Our qualitative research in nursing homes that adopted and implemented EMR revealed substantial variation in the goals and objectives these homes hoped EMR would help them achieve. We now want to offer three propositions (or hypotheses) that link a home's adoption strategy to financial, resident care, and employment-related outcomes. Of course, we readily acknowledge that other factors are likely to influence these outcomes, but here we stress the link between organizational strategies and outcomes—a dimension previous researchers slighted. At this stage of our nursing home research, we do not have the data necessary to test our propositions, but within the foreseeable future we will be able to perform the empirical tests required to confirm or refute them. Table 3 shows our hypotheses regarding each of the three adoption strategies and each of the three outcome categories. In the table a plus (+) sign indicates that we believe a particular strategy will have a positive effect on a particular category of outcomes; a negative (-) sign indicates that a strategy will either have a negative effect or, alternatively, no significant effect on a category of outcomes.

First, in homes adopting a control strategy the linkage between EMR and resident or employee outcomes was not a central one. But we hypothesize that it is likely that the transition from paper-based methods of documentation to electronic methods will deliver financial savings in the form of logistical cost reductions and savings in staff time. Accordingly, we propose that the primary effect of EMR in control homes will come in the form of the financial returns on the investment in this technology. Given the lack of emphasis on either resident or employee outcomes in control homes, we do not believe that EMR will have a positive effect on resident care outcomes or employment outcomes (such as recruitment, retention, teamwork, and job satisfaction).

Proposition 1: In nursing homes with a control-oriented strategic approach to EMR adoption the implementation of this technology will be positively associated with improved financial outcomes but will not be associated with positive resident care outcomes or employment-related outcomes.

Second, regarding efficiency homes, the primary objective of administrators was to streamline operations and improve organizational monitoring and learning capabilities. Top management in efficiency homes did believe that the adoption of EMR would improve resident care through the better utilization of frontline staff and through more efficient and accurate documentation. Given this finding, we propose that in efficiency homes EMR will have a positive effect on both financial outcomes and resident care outcomes.

Proposition 2: In nursing homes with an efficiency-oriented strategic approach to EMR adoption the implementation of this technology will be positively associated with financial and resident care outcomes but will not be associated with positive employment-related outcomes.

Finally, nursing homes pursuing an empowerment strategy viewed EMR, first and foremost, as a tool they could use to increase employee participation and involvement.

EMR was adopted as part and parcel of a broader organizational transformation, which included the use of practices associated with high-performance work systems and resident-centered care. Given these organizational motivations, we propose that in empowerment homes EMR will have a positive effect on outcomes in all three outcome categories.

Proposition 3: In nursing homes with an empowerment- oriented strategic approach to EMR adoption the implementation of this technology will be positively associated with financial, resident care, and employee related outcomes.

[Insert Table 3 About Here]

Discussion and Conclusion

President-Elect Obama has made it clear that he intends the adoption of EMR to play a central role in his plans to restructure the healthcare system in the United States. His emphasis on the importance of EMR in healthcare reform rests on the assumption that this technology has the potential to alleviate many of the chronic ailments plaguing the healthcare system. In their frequently cited study on the benefits of EMR adoption, Hillestad et al. (2005) state, “It is widely believed that broad adoption of electronic medical record (EMR) systems will lead to major health care savings, reduce medical errors, and improve health” (Hillestad et al., p. 1103).

Proponents of EMR, however, have not adequately addressed the role that organizational factors play in determining the extent to which healthcare organizations will benefit, if at all, from the introduction of this technology. In this paper we propose that the outcomes associated with the introduction of EMR in nursing homes rest, among other things, on the strategic goals and objectives administrators intend to achieve.

Based on field research in ten nursing homes in the New York City area, we propose a typology of three distinct strategies for adopting EMR: control, efficiency, and

empowerment. In our field research we found that each of these strategies was associated with certain organizational characteristics, such as management style, the character of employment and labor relations, and the adoption of resident-centered care. We believe our typology has a number of practical implications for the discussion of the future of EMR technology in healthcare organizations.

First, our research suggests that the adoption of EMR is not uniform across all organizations, and some healthcare organizations will benefit more than others from this innovation. From a public policy standpoint the implication is clear: if the federal government or individual state governments subsidize the adoption of EMR technology, we can expect that certain types of healthcare organizations will be more suitable for such public investments than others. Healthcare organizations that pursue a broader efficiency or empowerment strategy for EMR adoption may yield a greater return on public investment than organizations with a narrower orientation. Given the limited resources available for EMR adoption, it would be more effective public policy to encourage investment in organizations in which it is more likely that EMR would enhance financial returns, the quality of healthcare, and workforce-related outcomes.

Second, however, we do not argue that organizations, including nursing homes, are immutable; indeed, in our second wave of field interviews we discovered that a handful of the homes we had classified in one strategic category or another seemed to have shifted over the course of the year. Although we cannot say with certainty why some of these shifts occurred, we believe the adoption of EMR itself might have been responsible for changes in management strategies and practices, particularly in the control homes. A change in leadership was probably an important factor causing a

change in strategic orientation in one or two of the homes. We do not intend to argue that only certain types of nursing homes have the potential of benefiting from EMR. What we do propose is that carefully crafted guidelines can be used to select nursing homes in which the investment in EMR is more likely to lead to positive outcomes. For example, investment in EMR in homes with healthy employment and labor relations is likelier to prove more fruitful than investment in homes with difficult employment and labor relations. Similarly, investment in EMR in homes that have implemented resident-centered care is likely to have a bigger payoff than investment in more traditional homes. Thus, healthcare organizations interested in adopting EMR should consider improving specific organizational factors first (such as employment relations) so as to increase the probability of achieving positive outcomes.

Finally, our first wave of field interviews revealed the fact that most nursing home administrators had a particular vision for how EMR could benefit their organization; their vision was linked to their understanding of the mechanism by which EMR could deliver these benefits. In our subsequent field visits, however, we realized that few of the administrators (perhaps two or three) did not actually have any vision at all about the potential or actual benefits of EMR. Possibly, the inability of these administrators to articulate the benefits derived from EMR was the consequence of the fact that, one year after the introduction of the technology, the benefits the administrators hoped to obtain had not materialized. Thus, in addition to the three strategic orientation categories discussed above, we propose a fourth category, namely, the absence of any clearly articulated adoption vision.

As one of the administrators stated, “This technology is only a tool and will not benefit the home without a clear model of leadership. Without it, we will end up with an electronic version of what we did before EMR.” (Interview with nursing home administrator, July 2007) Delivering on the EMR revolution will take more than sophisticated technology. EMR is a potentially powerful vehicle through which management can attempt to enhance key organizational outcomes. It will not, however, serve as an effective vehicle without a clear vision and strategy from top management and the appropriate practices and work arrangements that can support them.

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Table 1: A Typology of Strategies for the Adoption of EMR

	Type A	Type B	Type C
Strategic EMR Goals and Objectives	<i>Control</i>	<i>Efficiency</i>	<i>Empowerment</i>
Top Management's Application of EMR	<i>Surveillance and discipline</i>	<i>Monitoring and learning</i>	<i>Learning and skill development</i>

Table 2: Organizational Characteristics Associated with EMR Adoption Strategy

	Control Strategy	Efficiency Strategy	Empowerment Strategy
Managerial Style	<i>Authoritarian</i>	<i>Progressive</i>	<i>Participatory</i>
Employment Relations	<i>Adversarial</i>	<i>Traditional</i>	<i>High Performance</i>
Labor Relations	<i>Adversarial</i>	<i>Cooperative</i>	<i>Cooperative</i>
Resident-Centered Care	<i>No</i>	<i>Partial</i>	<i>Yes</i>

Table 3: The Proposed Relationship between EMR Strategies and Outcomes

	Financial Outcomes	Resident Care Outcomes	Employee Outcomes
Control Strategy	+	-	-
Efficiency Strategy	+	+	-
Empowerment Strategy	+	+	+

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^{iv} It is important to note that this study was conducted in the hospital setting. In fact, most of the research on EMR adoption has been conducted in non nursing home settings. Thus, implications from these early EMR studies need to be applied with caution when discussing the nursing home context.

^v 140 of these nursing homes were eligible to participate in the EMR demonstration project described below.

^{vi} Two of the co-authors of this paper (Lipsky and Avgar) serve as the co-principal investigators for the portion of the project that deals with the effects of the introduction of EMR on employment and labor relations. Two other Cornell faculty members, Karl Pillemer and Rhoda Meador, direct the portion of the project that deals with the effects of the introduction of EMR on resident healthcare. The Commonwealth Fund also awarded a grant to Pillemer and Meador to study the use of resident-centered care in these homes. (Resident-centered care is discussed below; see also Doty et al., 2008, and Scott et al., 2003.) Subsequently, the Commonwealth Fund awarded still another grant to researchers at the University of Pennsylvania to conduct an evaluation of the financial and economic aspects of the project. Lorin Hitt, a faculty member at the Wharton School, and Prasanna Tambe at New York University serve as the lead researchers for this Commonwealth Fund grant.

^{vii} The telephone surveys are supervised and administered by the Survey Research Institute at Cornell University.

^{viii} It should be noted that although the hardware and software implemented in each of the ten homes was the same, some of the nursing homes chose to implement different applications of the technology, making the range of EMR capabilities slightly different for some of the nursing homes. Nevertheless, the primary records keeping functions were identical across the ten organizations.

^{ix} This is not to say that wages and benefits were literally identical across the ten homes.

^x One of the ten nursing homes included in our study is located in Orange County, NY, approximately 150 miles northwest of the New York City area.

^{xi} The reduction in clinical staffing positions was seen as a delicate issue. On the one hand, reducing unionized positions as a result of the EMR technology would violate the collective bargaining agreement and the spirit of the partnership. On the other hand, many of the administrators we interviewed alluded to their hopes that EMR technology would have some effect on required staffing levels.