



Case Study

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Lessons from a Health Information Technology Demonstration in New York Nursing Homes

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ABSTRACT: The New York State Nursing Home Health Information Technology (HIT) Demonstration Project is a publicly subsidized initiative to implement comprehensive, point-of-care electronic medical records in 20 New York City nursing homes. Because of an innovative union–employer partnership, direct-care staff of the homes were heavily involved in the planning process. Union employees were assured upfront that no layoffs would result from HIT implementation, and training was a high priority in vendor selection. All participating homes successfully replaced paper records with electronic ones, and, after the intensive pre-implementation planning period, it took less than six months on average for facilities to make this transition. Despite this shared success, variation existed between homes regarding: 1) organizational aims for adapting HIT; 2) the technology’s perceived or real effects; and 3) implementation of quality improvement efforts as a result of newly available data.



THE NATIONAL CONTEXT

President Obama’s economic stimulus legislation, the American Recovery and Reinvestment Act of 2009 (ARRA), committed unprecedented new resources toward creating a health information technology (HIT) infrastructure for all U.S. health care sectors, establishing HIT as a federal priority.¹ ARRA issued the national goal of “utilization of an electronic health record for each person in the United States by 2014.”² With that goal in mind, this case study sheds light on HIT funding, deployment strategies, and outcomes in the long-term care nursing home sector in the New York City area, in the hope that the nearly 1.5 million Americans with complex health care needs who currently reside or are rehabilitated in nursing homes will benefit.³

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NEW YORK'S NURSING HOME HIT DEMONSTRATION: BACKGROUND

The New York State Nursing Home Health Information Technology Demonstration Project is a publicly subsidized initiative implementing comprehensive, point-of-care, clinician-centric HIT systems in 20 New York City–area nursing homes. The demonstration has simultaneously created an electronic medical record (EMR) for every resident in participating homes (totaling 4,467 beds) while automating the workflow and record-keeping for every direct-care staff person and clinician. An innovative union–employer partnership included direct-care staff at all stages of program planning, and union staff were assured that no layoffs would result from HIT implementation.

Adoption of HIT in these homes has been marked by variations in how the technology has been used and how it has affected the organizations. Comprehensive research evaluations will define and measure these variations, and will address questions about the impact HIT adoption has had on quality of care for nursing home residents, workforce retention, labor and employment relations, organizational culture, and the financial impact on homes.

The demonstration originated in a unique partnership between unionized labor and nursing home employers centered on quality improvement. In 2002, the union representing workers in 95 percent of nursing homes in New York City, 1199SEIU United Healthcare Workers East (1199SEIU), and 140 primarily for-profit nursing homes in the greater New York metropolitan area, agreed in their collective bargaining agreement to establish the three-member Quality Care Oversight Committee.⁴

The oversight committee was originally intended to study and review practices designed to improve the quality of resident care in nursing homes. However, it remained inactive until March 2006, when the impartial arbitrator and neutral chair of the committee directed it, as part of an arbitration award, “to develop and commence research and demonstration programs” in a sample of nursing homes, including

“It is essential the homes utilize the available technology to enhance the quality of resident care. In turn, such technological advances will improve the working environment, advantaging the Employers’ ability to retain and recruit direct-care staff.”

In the Matter of the Interest Arbitration between Southern New York Associates, L.L.C., et al., and 1199SEIU United Health Care Workers East, March 2006.

“the acquisition of electronic monitoring and data collection equipment; professional training of staff members in the use of such electronic equipment; . . . revision of computerized systems and network communications; automated assessments, care plans,” and related tasks.⁵

The arbitration award defined a funding mechanism to establish a research and demonstration project from within the employer–union structure. However, the mutually beneficial goals of improved quality of care and workforce retention laid the foundation for labor and employers to powerfully partner in seeking public funding. Their representatives together approached the New York state legislature with a proposal, and in late 2006 the legislature authorized a grant of \$9 million to support the adoption of HIT in a group of nursing homes in the New York City area. The oversight committee was charged with directing and monitoring the project.

HIT VENDOR AND PRODUCT SELECTION

The oversight committee supervised a rigorous process for selecting an HIT vendor, requiring that HIT technology be “clinician-centric” and available at “point of care.” The goal was to completely automate nursing home clinical and workflow functions, including patient care notes at the bedside, physician orders, medication administration records, care plans, nursing instructions, and certified nursing assistant (CNA) assignments. These requirements were innovative, since much of then-existing information technology deployed in nursing homes was directed at administrative tasks, rather than automation of patient care and daily direct-care workflow.

Another criterion in selecting a vendor was its capability of providing each home with comprehensive implementation support, including effective staff training. This was crucial, because the HIT demonstration design required that all elements of the software package be implemented fully throughout the entire home and used by all direct-care staff. An important factor in ultimately choosing the vendor was its commitment to helping homes analyze and restructure their daily workflow as part of HIT pre-implementation, and informing staff of the positive benefits of the new technology.

In late 2006, the oversight committee awarded the HIT demonstration technology contract to New York City–based eHealth Solutions, Inc. The selected product system, SigmaCare, consisted of a centrally managed Web-based software application that enables staff to use durable handheld devices (personal digital assistants, or PDAs), and computer laptops and desktops to record all details relating to the care provided to residents in real time, manage workflow, and maintain a complete electronic medical record (EMR) for each resident.⁶ Information is stored in an offsite secure data center. Different categories of caregivers have access to types of information in the resident record that they need specifically (e.g., onsite nurses

can access different sets of information than CNAs; residents’ physicians can see critical information at any time and place via the Internet.)

The SigmaCare system offers extensive capabilities for analyzing information for quality improvement via “dashboards,” computer screens that summarize data in real time. Data can be categorized at the level of resident, unit, or facility-wide. The system reduces or eliminates the need for separate paper copies of orders, records, or care plans.

Terms of the State Subsidy

The oversight committee structured the contract between the HIT vendor and the homes so that HIT implementation costs, such as software, hardware, installation, and staff training, would be merged with all subsequent yearly operating and maintenance costs over a five-year contract period. This created a fixed per-bed, per-day rate for the entire course of the agreement. The fixed rate was two-tiered to recognize efficiencies of size: homes with more than 220 beds received a slightly lower rate than smaller homes. With this strategy, homes could calculate a predictable amount into their operating costs during the contract period.

SigmaCare Software

What It Is

SigmaCare is a secure wireless mobile electronic medical record system designed specifically for nursing home staff based on their workflow.

What It Does

- Automates physician orders, medication administration records, treatment administration records, care plans, progress notes, nursing instructions, and assignments for nursing assistants.
- Allows clinicians to monitor real-time quality measures. Reports on clinical exceptions.
- Provides clinical decision-support features, such as medication interactions.
- Provides task reminders and customizable drop-down menus with care protocols to assist caregivers in daily workflow.
- Gives different levels of facility staff access to their appropriate “dashboard”—summary information about resident(s), unit(s), or the whole facility.
- Includes interoperability components for potential collection and transfer of data with any Regional Health Information Organization (RHIO), and exchange of information with other providers in the long-term care continuum, such as labs or hospitals.

Subsidized Start-Up and Adoption Period

The New York HIT demonstration contract was designed so that the first 17 months of the 60-month agreement (28%) was paid for in full with the grant subsidy from New York State via an intermediary administrative designee. Thus, homes were offered a “free” start-up and adoption period, removing hurdles related to obtaining initial capital. However, since they were required to commit to staying with the contract for the remaining 43 months, homes would eventually pay some part of that initial cost over time as part of the average of all costs. The fixed per-bed, per-day rate allowed a 200-bed nursing home, for example, to predict costs of about \$17,700 per month (plus taxes) for the five years of the contract, with the first 17 months paid by the subsidy. A portion of these expenditures were eligible for reimbursement as capital costs under Medicaid.

Administrative Coordination

The oversight committee acted as a program coordinator to help facilitate HIT adoption by individual homes. The committee first researched which HIT features and contract terms homes desired, set the vendor criteria, and conducted the vendor selection process. Then, in coordination with the vendor, the committee educated eligible homes about what the transition to HIT would entail. The committee also selected a designee to coordinate the financial and management aspects of the HIT demonstration. That designee, the 1199SEIU Training & Employment Fund (1199 Training Fund), was experienced in working with unionized staff and employers in training and quality improvement initiatives. The 1199 Training Fund coordinated logistics between the homes, vendor, and research teams. It also helped to prepare staff in each home for HIT implementation.

Requirements for Home Participation

To remain eligible for participation in the demonstration project, nursing homes were required to honor the financial terms of the contract. They were also required to comply with workforce and organizational commitments specified in the contract, including:

- Coordinating with the 1199 Training Fund to create a labor–management committee to guide the preparation and early HIT implementation in each home.
- Committing to no layoffs of any union staff as a result of improved efficiencies resulting from HIT implementation. Reflecting the original union–employer goal of increased quality of care and workforce retention, this was a de facto agreement aimed at reinvesting potential savings in staff time back into quality of care for residents, or to reduce the need for agency (non-union, part-time) staff.
- Implementing HIT software throughout the entire home and for use by all direct-care staff. Partial implementation (of selected clinical features or in some units) was not permitted.
- Cooperating with researchers connected with the project.
- Dedicating a management staff person as the facility-level coordinator and contact for HIT implementation.
- Absorbing the cost of staff time required for training in the use of the technology participation in a labor–management committee, and managing the start-up and ongoing coordination of HIT.

Application Process

These contractual and organizational terms, created and overseen by a union–employer partnership, were attractive to many unionized nursing home operators. Among the 140 nursing homes that were parties to the collective bargaining agreement and thus eligible to apply, 83 submitted letters-of-interest for the 20 subsidized openings in the HIT demonstration. These interested homes were sent a questionnaire designed by the vendor to gather additional information, and from the 54 homes that returned the questionnaire, final participants were chosen by the oversight committee in collaboration with the vendor.

Exhibit 1. Snapshot: 20 HIT Demonstration Homes

Greater New York City metropolitan area: Brooklyn, Bronx, Manhattan, Queens, Staten Island (12); Long Island (6); north of New York City (2)

| | | | | |
|---|-----------------|--------------|-------------|-------------------------|
| Total number of beds in demonstration project homes = 4,467 | Average* | High* | Low* | National Average |
| Number of beds per facility | 223 | 320 | 120 | 107*** |
| % of residents paid by Medicaid | 78 | 98 | 54 | 64** |
| % of residents paid by Medicare | 13 | 26 | 2 | 14** |

Sources: * 1199SEIU Training Fund, March 2007.
 ** Henry J. Kaiser Family Foundation, <http://www.statehealthfacts.org/comparebar.jsp?ind=410&cat=8>, downloaded 4/23/09.*** Centers for Disease Control and Prevention, National Center for Health Statistics, <http://www.cdc.gov/nchs/data/nhhd/nursinghomefacilities2006.pdf>, downloaded 4/23/09.

| | Demonstration Homes | National Average+ |
|----------------------|----------------------------|--------------------------|
| For-profit ownership | 95% | 67% |
| Nonprofit ownership | 5% | 27% |
| Government ownership | 0% | 6% |

+ Source: American Health Care Association, http://www.ahcancal.org/research_data/oscar_data/Nursing%20Facility%20Operational%20Characteristics/Nursing_Facility_OwnershipDec2008.pdf (downloaded 4/23/09).

SUCCESSFUL IMPLEMENTATION

In March 2007, the first HIT demonstration homes signed a contract with the vendor and began to roll out the HIT system through a multiphase process of planning, training, and monitoring. Within little over a year, by the end of March 2008, 17 of the 20 homes had “gone live” with the technology in all units and for all staff. An additional three homes were deployed between November 2008 and April 2009. Key elements of the project’s implementation experience contradict two commonly perceived barriers to successful

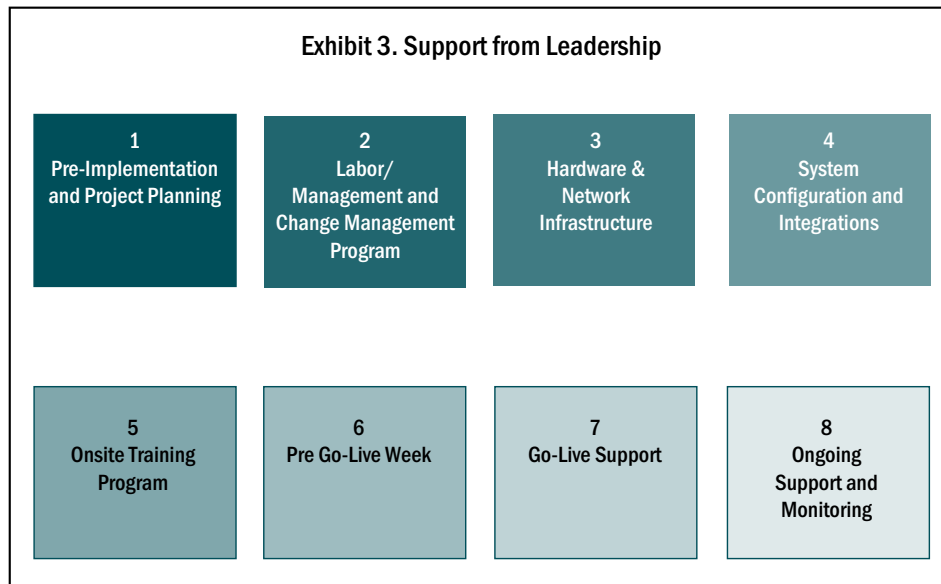
and rapid adoption of HIT in nursing home settings (Exhibit 2). The components of this rapid, full, and logistically successful implementation strategy are summarized in Exhibit 3.

Both the demonstration project administrators and the vendor viewed two factors as crucial to successful implementation: 1) strong support from home leadership in planning and preparing for the technology; and 2) the involvement of multiple levels of home staff in understanding, accepting, and offering input about the technology.

Exhibit 2. HIT Adoption in Nursing Homes: Perception vs. Fact

| Perceived Barrier | HIT Demonstration Facts |
|--|---|
| It takes years to transition an entire facility from a paper to an electronic medical record. | The average time for all units in a nursing home to transition their clinical and workflow functions to a health information system, from the start of pre-implementation planning to the moment all staff “went live,” was less than six months. This occurred after groundwork was laid by collaborative labor–management committees and involvement of multiple levels of staff in pre-planning. |
| Direct-care staff will be unable to learn to effectively use the technology at all or in a reasonable timeframe. | All direct-care staff in the nursing homes learned to access and record clinical and workflow information in real time on handheld PDAs or laptops/desktops, with an average formal training period of 12 hours for RNs/LPNs and two hours for CNAs. Training took place over a period of one to four weeks, with additional post-training support provided onsite from the vendor. |

Source: 1199SEIU Training & Employment Fund. Data are from the first 17 nursing homes implemented between March 2007 and March 2008.



Role of Administrative Leadership

Administrative leadership dedicated a good deal of work to the pre-implementation phase. Within a short time, home leadership worked with the vendor to document and analyze their facilities' workflow, staffing needs, user information, physician order and care plan back-order entries, as well as physical plant issues related to hardware and network infrastructure. This process presented an opportunity and potential catalyst for reviewing organizational structures and priorities, although not all homes perceived it or used it in this way. Leadership also faced choices about how to encourage their staff's willingness and enthusiasm to learn the technology.

Engaging All Levels of Staff

The labor-management committees created by homes as a participation requirement for the HIT demonstration provided a structured approach to engaging all levels of staff in the implementation process. These committees were facilitated by the 1199 Training Fund during the implementation phases before homes went live with technology. They aimed to engage nursing home staff and administrators in collaborative decision-making related to HIT implementation, familiarize and educate all levels of staff about the benefits and characteristics of HIT, including allaying fears or misconceptions, and promote a network of peer support for learning the technology. "No health care worker left behind" became the unofficial motto of the committees.

HIT Labor-Management Committees

HIT labor-management committees were designed to consist of a minimum of eight members, four from different job occupations among union staff, and four from management. In practice, their sizes varied from home to home, with some as large as 25 members. The committees met six to eight times for an hour each time over the four-to-six-month period before the home went completely live. They were a conduit of information to facility staff during the process. Committees developed festive kickoff events to introduce and celebrate the coming arrival of HIT to that facility, the first of several informal opportunities prior to training for staff to see and experience the handheld PDAs and laptops they would be using. Another key activity of the committees was to identify and create peer mentors, that is, "go-to" people who were available to answer questions and offer support.

Does Subsidization Lead to Voluntary Spread of HIT?

An interesting development barely two years after the start of the subsidized New York HIT demonstration is that other nursing homes have apparently perceived benefits in the investments their competitors and peers are making in HIT. As of April 2009, 40 additional homes in New York voluntarily implemented technology by purchasing products from eHealth Solutions, Inc. Thirteen purchased complete HIT packages equivalent to those used in the demonstration. Another 30 homes were in the process of contracting for various applications.⁷ The implications of this phenomenon are worthy of consideration by policymakers: Does subsidization catalyze voluntary spread and replication of similar technology?

Common Challenges

Staff from the 1199 Training Fund reported that the most common challenges they encountered when facilitating the labor–management committees were:

- fear of change and losing control from both workers and management;
- fear of layoffs resulting from increased efficiency from the technology;
- fear of disciplinary actions, owing to a greater ability of management to monitor workers;
- fear that government would have access to confidential information; and
- fear by staff of its own inability to learn the technology because of such factors as learning difficulties, language barriers, and unfamiliarity with computers.

The opportunity and willingness to address these issues honestly in advance of the introduction of the new technology was a distinctive feature of the project.

Staff Training

Onsite staff training by the vendor commenced after organizational planning, network infrastructure, and system configuration were completed. Over a period of one to four weeks, RNs/LPNs received 12 hours of formal training, while CNAs, whose recording responsibilities were less involved than clinical staff, received two hours. Other professionals, such as physicians, social workers, rehabilitation therapists, and dietitians received training specific to their specialties

as well. Additional intensive training was provided onsite from the vendor during the “go-live” week. These multiple trainings accommodated individuals who might need more time or one-to-one attention to learn the technology, and provided the opportunity for mentors within each facility to provide on-the-job assistance. Within this environment of preparation and support, all frontline staff learned to record information in real time on handheld PDAs or laptops/desktops.

After staff training, homes activated the technology throughout the facilities one or two units at a time, usually over a period of days or weeks, with a strong presence from the vendor’s staff. Ongoing support and monitoring from the vendor after the go-live period included round-the-clock customer support. The 1199 Training Fund withdrew from its onsite role as labor–management facilitator after the go-live period, but remained a fiscal intermediary agent during the subsidy period, available to resolve issues between the vendor and homes.

Preparation for Annual Regulatory Surveys

The leaders of the HIT demonstration recognized the importance of informing the New York State Survey Agency about the new HIT technology and its implications for regulatory visits. In August 2007, at the time the first homes were going live with the HIT system, project coordinators briefed New York State Department of Health (DOH) officials, who requested that surveyors be trained in the use of the technology for survey purposes. In December 2007, approximately 100 representatives from the federal Centers for Medicare and Medicaid Services and DOH surveyors were trained by the vendor in accessing information

from the HIT system relevant to regulatory visits. The vendor provided six months of additional webinars to DOH to update new survey staff. Homes participating in the demonstration were encouraged to inform the survey team upon arrival about the new HIT features, and to provide tutorials or guidance, if needed. In addition, the vendor was notified by nursing homes when a survey team had arrived onsite, and sent one of its staff to stand by to assist with instructing surveyors.

HIT Adoption: Variation Is the Theme

The project's implementation process successfully launched homes into the adoption stage of HIT use, marked by the replacement of paper records with electronic ones and use of the technology across all direct-care staff. In March 2009, for instance, among the 17 nursing homes that had been deployed as of a year earlier, the aggregate certified nursing assistant on-time documentation rate was 99 percent, representing a total of 118,600 CNA tasks per day. Medication administration records and treatment administration records for the 17 homes collectively totaled 69,100 per day, again with 99 percent documented on time.⁸ However this overall statistic masks the significant variation across homes.

Same Technology, Different Effects

Despite the fact that each home implemented the same software and hardware via the same vendor, there have been notable variations observed both by early research findings and by the 1199 Training Fund coordinators about how the adoption of HIT has affected, and has been used by, homes. Examples of these differences range from how homes responded to bugs in the HIT system, to whether the technology was fundamentally perceived as a means of improving clinical indicators, financial outcomes, employee efficiency, or the entire culture of a home.

For instance, data from the HIT system increase transparency in workflow and production documentation. Because all entries can be viewed in real time and are required by the end of the shift, it becomes easier for administrative staff to identify delays in delivery of

time-sensitive tasks, such as medication administration. Some homes have viewed such data as an indicator of staff ineffectiveness and sought to resolve the perceived problem through that lens; others have undertaken root-cause analysis of how all factors in their system might be contributing to delays in medication distribution, such as numbers of medications per resident, or per unit, in relation to staffing patterns.

Another difference has been in perceived time savings. David Lipsky and Ariel Avgar of the Cornell Scheinman Institute for Conflict Resolution (ICR) conducted interviews at demonstration homes one year after the installation of the HIT system, which revealed contradictory findings. Comparing electronic and paper records, the administrator of one home stated:

It takes more time to access the record. You have to go into the system. You have to go through all of the prompts to get to whatever it is that you are looking for . . . a care plan or to order medications Whatever it is you need to do, it takes longer to do the job you have to do. I'm not talking about hours, of course, but every minute counts. So everyone has confirmed—all departments—that it takes more time to do their job.⁹

A supervisor in another home offered a different report:

I see the CNAs have more time now to sit down one-on-one with residents; they are spending more quality time with them. They are not rushing to do their books between two and three o'clock.¹⁰

Meanwhile, a frontline staff person in a third home reflected:

I think I'm spending more time with the residents, being that I don't have to go back to the office to document that they're not feeling right . . . I can just click off and go into a progress note It's less time in the office, and you can profile medication, consults—everything is right there in front of you.¹¹

Variation in Use of Available HIT Data

An important area in which homes have varied significantly is how they have used the range of data available through the HIT system. While homes met the basic logistical benchmarks of creating an EMR for each resident, automating workflow tasks and physician order entry, and activating some clinical decision support menus, coordinators of the HIT demonstration now understand that this represents only one step toward achieving the potential benefits of HIT in nursing homes. HIT can also summarize complicated data in real time, customize clinical decision-support and workflow prompts, and perform multivariable analyses of individual residents, units, facility-wide trends, and staff. The quality improvement possibilities inherent in these capabilities are very rich. Not all homes, however, have engaged in these types of analyses and customizations, and those that did pursued different strategies.

Are Data Analysis Benchmarks Needed?

The following are examples of analyses some homes have reported they perform with HIT capabilities. Administrators said these functions are quicker and easier to perform with HIT than with a paper record:

- check nosocomial infection rate per unit on a daily basis, resulting in timely interventions with increased precautions to contain and prevent the spread of any identified infection;
- analyze daily direct-care staff record of changes in care needed by residents, resulting in quickly and accurately updating residents' care plans;
- revise billing categories more regularly to accurately reflect levels of care and improve reimbursement rates;
- more closely track incontinence in residents for analysis of potential causes and solutions;
- maximize use of existing staffing to balance workloads and resident needs; and

- stimulate efficiency among staff by awarding recognition for highest levels of complete on-time documentation by shift and unit.

Project coordinators did not originally foresee the need to specify benchmarks related to quality improvement analyses, or the customization of features that might maximize resident quality of care, increase organizational efficiencies, or improve staff working conditions. Thus, there was no expectation or ongoing training process during the subsidized period for all administrators or staff to learn and use these capabilities. This raises an important question for policymakers: Should national HIT funding strategies include targeted benchmarks and/or incentives to encourage maximization of the quality improvement uses of technology, in addition to focusing on the replacement of paper records with electronic ones? If so, what should those benchmarks be?

Diverse Organizational Priorities and Perceptions

The variation in the perceived and real effects of HIT adoption across homes may be a function of different organizational goals and leadership styles that predispose homes to perceive any new development, HIT or otherwise, through particular lenses. This is a theory that David Lipsky and Ariel Avgar have formulated based on their early review of qualitative organizational and workforce data from 10 demonstration homes and five control homes collected before the HIT implementation and one year after. Seeking to explain why the same hardware and software have apparently been regarded and used differently among the demonstration homes, they identify different managerial strategies and goals for adoption of the HIT system among the demonstration homes. Lipsky and Avgar then correlate these strategies and goals with the effects of HIT on resident care, financial, and workforce outcomes.

Examples from their interview data illustrate the range of responses their theory encompasses:

1. In a post-implementation interview, one administrator described a primary focus on resident care

as the lens through which the HIT system was perceived:

Sigma Care is like a hub, and everything we do everyday, the dashboard drives our day. But what is the dashboard? The dashboard is filled with resident information, so the residents are driving our day. So it has kind of brought us all together. I think that there's just a greater emphasis placed on resident care in general.¹²

2. Another administrator focused on the opportunities for improved financial returns through use of the HIT system:

Speaking fiscally, you are being paid for the care that you provide—that is going to be the future. The only way to capture it is electronically. The more information you capture, the more money you are going to make. Shouldn't you get paid for everything you do?¹³

3. Yet another administrator spoke prior to implementation about how the HIT system was intended to facilitate staff empowerment and education:

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.¹⁴

Multifaceted Research

Lipsky and Avgar's research is only one component of an unusually comprehensive range of evaluations sponsored by New York's HIT demonstration and The Commonwealth Fund to fully investigate the effects of HIT adoption on participating nursing homes. The elements of the research reflect the multifaceted nature of nursing homes as organizations. Nursing homes are simultaneously clinical care systems, complex workforce environments, business enterprises, and homes to residents. Research will focus on the technology's

impact on these four areas: quality of care, workplace issues, business impact, and culture of the home.

Together, these evaluations will be the first to capture the effects of HIT adoption on so many dimensions in so large a sample of nursing homes. A unique characteristic of the final analyses will be integrated and multidisciplinary comparisons of targeted data designed to elicit findings from a wide range of perspectives (Exhibit 4).

Self-Reported Data from Homes

While research data are not yet available for the project as a whole, some homes have individually tracked and reported cost savings and clinical efficiencies, including reduced formulary costs, fewer diagnostic code errors in medications, and improved accuracy in recording acuity levels for reimbursement purposes. The [Appendix](#) summarizes self-reported information from one demonstration home.

CONCLUSIONS

Replication Considerations

The New York State Nursing Home Health Information Technology Demonstration Project offers a logistically successful model for implementation of point-of-care electronic health records for a substantial sample of nursing home residents, using partial public subsidization. Potential replicators of the project, and those who mold future HIT funding strategies, would do well to take note of the defining elements of the project before embarking on similar designs. The project's successful union–employer partnership was motivated by the dual goals of improving both quality of resident care *and* staff retention and recruitment. These two goals shaped the framework for the project. Specifically, the prohibition against laying off union staff and the creation of labor–management committees appear to have contributed to overcoming barriers to acceptance of the new technology by direct-care staff. An implied result of this prohibition is that improved efficiencies would be reinvested into better resident care. If these priorities and guarantees had

Exhibit 4. Research Questions

Resident Quality of Care and Quality of Life^a

What impact will the installation of HIT have on:

- specific measurable resident outcomes of falls, skin breakdown, hospitalizations, behavior problems, and change in functional status;
- resident mood and quality of life measure; and
- facility-wide indicators including skin breakdown, incontinence, decline in cognition, UTIs, and fecal impaction?

What are subjective resident reactions to the introduction of HIT, including:

- awareness of the new technologies;
- attitudes toward the new technologies; and
- satisfaction with care by and relationships with staff?

Workplace Impact: Employment and Labor Relations^b

What are the effects of the new technologies on:

- workforce retention and recruitment;
- employee perceptions and attitudes, including job satisfaction, stress and commitment;
- organizational effects, such as communication among and between staff, organization of work, and organizational culture;
- resistance to change and conflict; and
- labor relations, such as organizational and bargaining unit effects, and labor-employer perceptions and attitudes?

The Business Case for Nursing Home HIT^c

How does HIT affect nursing home productivity?
 What factors cause the productivity effects of HIT to vary across homes?
 What is the business case for investing in HIT by nursing home operators and for other long-term care stakeholders, such as payors and residents/families?

Resident-Centered Care (Culture Change)^d

What impact does the installation of an electronic health record have on the level of resident-centered care (culture change) in participating facilities?

^a Karl Pillemer and Rhoda Meador, Cornell Institute for Translational Research on Aging.
^b David Lipsky and Ariel Avgar, Cornell Scheinman Institute on Conflict Resolution.
^c Lorin Hitt and Prasanna Tambe, Wharton School of University of Pennsylvania.
^d Cornell Institute for Translational Research on Aging and Cornell Scheinman Institute on Conflict Resolution.

not been present, HIT implementation may have unfolded differently.

There are important implications here:

1. Assuming that resident quality of care and workforce retention are national health care priorities, is there a need to ensure reinvestment of some portion of the financial benefits of publicly subsidized HIT into these areas?
2. In homes where union–employer partnerships are not present, how can employers best engage staff to overcome potential barriers to accepting HIT implementation?

Lessons Learned

Key lessons learned from the implementation and early adoption experiences of the HIT demonstration include:

- Many nursing homes were willing to implement major transformations to adopt a point-of-care, clinician-centric HIT system when financial, logistical, and administrative support were offered by a union–employer partnership.
- It took less than six months to transition an entire facility from paper to an EMR in all units for all staff.
- This transition took place with the support of clear union–employer agreements, including the designation of a respected coordinating body for oversight of the project.
- Engaging multiple levels of staff in preparation for implementation via labor–management committees was an important part of the groundwork laid prior to adoption.

- Within this context, all direct-care staff were able to learn to use the technology effectively within a short period.
- The hurdle of initial capital outlay for HIT was overcome by a subsidy structure spreading all the costs of the HIT hardware, software, implementation, and maintenance over a multiple-year contract to create a single per-bed, per-day rate and a subsidized start-up and adoption period.
- The ability to support comprehensive organizational planning, workflow analysis, and staff training prior to implementation was an important criterion for selecting the vendor, in addition to the ability to provide secure, point-of-care, clinician-centric software and hardware.
- Home leadership appeared to have diverse organizational aims for adopting the technology.
- Home leadership seemed to have diverse perceptions of the effects of HIT technology on the organization.
- Homes significantly differed in how they used available HIT data for quality improvement purposes related to resident care, financial, and workforce outcomes.

Next Steps

The research outcomes of the HIT demonstration project will provide information about HIT implementation in nursing homes in New York City (Exhibit 5). Already, the logistical lessons learned from the project’s design, implementation, and early adoption periods provide information about health information technology funding and deployment strategies. This information should be useful for policymakers as they grapple with how to implement a HIT infrastructure across the United States.

FOR MORE INFORMATION

Further information about the New York State Nursing Home HIT Demonstration Project is available by e-mailing Scott White at the 1199SEIU Training & Employment Fund at ScottW@1199.org.

Exhibit 5. Research from the HIT Demonstration Project Will Help Clarify Key Issues

| Issue | Potential Solution from HIT |
|--|--|
| Exchange of complete admission and discharge data between nursing homes and hospitals is key to continuity of care, since residents frequently transfer between the two venues. | <i>Interoperable nursing home and hospital patient clinical records may improve quality of care upon admission and discharge, and contain costs due to unnecessary duplication of services.</i> |
| The long-term nature of care in nursing homes requires multidisciplinary, multifaceted care planning that includes ongoing consideration of quality of life and resident choice. Direct-care staff are the closest link to the resident in terms of gathering information and providing care on a daily basis. | <i>Clinician-centric HIT systems may allow multimember care teams, including direct-care staff and the resident, to input and access accurate information in a timely manner to optimize care planning and care delivery.</i> |
| High turnover rates in nursing home workforces currently plague long-term care facilities and impact their ability to deliver quality care. There will also be a need for increased recruitment of long-term care workers in the next decades to care for the influx of baby boomers. | <i>HIT may have a positive effect on both workforce retention and recruitment, thus contributing to an adequate and stable nursing home workforce.</i> |
| Current funding mechanisms for nursing homes are complicated formulas that require accurate capture of each resident’s activities of daily living and acuity levels. Federal and state regulatory reporting, documentation, and inspection requirements are extremely complex and take a large amount of nursing home staff time and effort. | <i>HIT systems may improve the speed and accuracy of capturing of reimbursement and regulatory data. Time saved through automated processes may give nursing home staff more time to provide care and interact with residents.</i> |

Appendix. Nursing Home Hospitalizations and HIT: One Facility's Experience

The following is provided by Administrator Caroline Rich of the Four Seasons Nursing & Rehabilitation Center in Brooklyn, New York. Four Seasons is a 270-bed facility with six units: long-term care, short-term rehabilitation, IV therapy, ventilator, dialysis, and adult day care. It was among the first two nursing homes to install the SigmaCare technology as part of the HIT demonstration in August 2007.

Can point-of-care, clinician-centric HIT help homes avoid unnecessary transfers of residents to the hospital or emergency room? Caroline Rich, administrator of Four Seasons Nursing & Rehabilitation Center, says, "The technology makes it possible for the resident's physician and the nursing home care team onsite to simultaneously access and confer about the resident's full clinical status in a matter of minutes. Then they can continue to monitor and communicate in real time as a standard intervention for fever or cough, for instance, is implemented, just as would be done in the ER. A paper record does not afford that kind of simultaneous, instantaneous access to clinical information, nor can the offsite physician easily monitor the resident's status via Internet."¹⁵

Given the importance of close monitoring by a physician when a frail elder becomes ill, it has not been unusual for physicians to err on the side of safety by ordering a transfer to the ER. A scenario described by Ms. Rich illustrates the clinical alternative with HIT.

"Last week Mrs. S. spiked a fever of 100.2 and was not eating much. The nursing supervisor immediately contacted the resident's physician offsite, who, via Internet, viewed Mrs. S.'s full clinical record over the last week, including the real-time data being entered at the bedside by the nursing team and direct-care staff, and a record of all her medications and when she had taken them. In response to her symptoms, a plan was made between the nursing home care team and physician to give Mrs. S. intravenous fluids for 24 hours to avoid dehydration, give fever-reducing medication, monitor her vital signs, and inform the physician of developments. The physician could view from offsite, at any time, the resident's ongoing treatment and care records. If hospitalization was indicated, it could have immediately been carried out, but Mrs. S.'s fever became normal over the next 24 hours and she began to eat and drink. The treatment plan was appropriate and no hospitalization resulted."¹⁶

NOTES

- ¹ The American Recovery and Reinvestment Act of 2009, TITLE XIII, Health Information Technology.
- ² *Ibid.* § 3001(c)(3)(A)(vii).
- ³ Center for Disease Control, National Center for Health Statistics, Nursing Home Current Residents June 2008, http://www.cdc.gov/nchs/data/nnhsd/Estimates/nnhs/Estimates_Demographics_Tables.pdf#Table04, downloaded April 13, 2009.
- ⁴ Private e-mail communication April 27, 2009, from Jay Sackman, former executive vice president of 1199SEIU Nursing Home Division. Parties to the collective bargaining agreement were five nursing home associations and other represented homes. The original and current membership of the Quality Care Oversight Committee include a nursing home employer representative, William Pascocello, a union representative, Jay Sackman, and a neutral chairman, the New York nursing home industry's impartial arbitrator, Martin Scheinman.
- ⁵ *In the Matter of the Interest Arbitration between Southern New York Associates, L.L.C., et al., and 1199SEIU United Health Care Workers East* (Martin F. Scheinman, Impartial Chair), March 2006, pp. 14–15.
- ⁶ <http://www.ehealthsolutions.com/index.asp>.
- ⁷ E-mail communication from Steve Pacicco at eHealth Solutions, Inc., April 28, 2009.
- ⁸ E-mail communication with eHealth Solutions, Inc., April 20, 2009.
- ⁹ Unpublished data provided in e-mail communication from Ariel Avgar, June 17, 2009.
- ¹⁰ *Ibid.*
- ¹¹ *Ibid.*
- ¹² *Ibid.*
- ¹³ *Ibid.*
- ¹⁴ D. B. Lipsky, A. C. Avgar, and J. R. Lamare, “Organizational Strategies for the Adoption of Electronic Medical Records: Toward an Understanding of Outcome Variation in Nursing Homes.” Presented at annual meeting of the Labor and Employment Relations Association, Jan. 4, 2009.
- ¹⁵ Interview and e-mail communication with Caroline Rich, April 2009.
- ¹⁶ *Ibid.*

ABOUT THE AUTHORS

Shana Lieberman Klinger, M.A., provides project management, research, written products, and program evaluation to nonprofit, government, and academic organizations. She coauthored the Individualized Care Pilot Toolbox (2008) at the Rhode Island Department of Health, summarizing an innovative project to promote resident-centered care in nursing homes via the mandated federal survey process. Current projects include the Optimization Study of the DEKA Arm at the Providence VA Medical Center.

Scott White has been an organizer in the labor movement for nearly 20 years, representing an array of health care workers in New York, New Jersey, and Connecticut. In late 2006, at the request of the 1199 Service Employees International Union (SEIU) leadership, he led the New York State Nursing Home Health Information Technology (HIT) Demonstration Project. Mr. White was subsequently nominated by the SEIU to be the health care workers' labor representative on the initial national HIT Policy Committee convened by the federal Office of the National Coordinator. In February 2009, the Government Accountability Office appointed him to the HIT Policy Committee, where he represents health care workers and their issues in the creation and advancement of a national health information network.

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The aim of Commonwealth Fund–sponsored case studies of this type is to identify institutions that have achieved results indicating high performance in a particular area of interest, have undertaken innovations designed to reach higher performance, or exemplify attributes that can foster high performance. The studies are intended to enable other institutions to draw lessons from the studied institutions' experience that will be helpful in their own efforts to become high performers. It is important to note, however, that even the best-performing organizations may fall short in some areas; doing well in one dimension of quality does not necessarily mean that the same level of quality will be achieved in other dimensions. Similarly, performance may vary from one year to the next. Thus, it is critical to adopt systematic approaches for improving quality and preventing harm to patients and staff.

