Trendspotting:
How IT Triggers Better Care in Nursing Homes

Introduction

Nursing home executives recognize that health information technology IT has the potential to improve both processes of care and resident outcomes. However, the path between technology adoption and the desired results is often unclear. As one California administrator put it, "I knew I needed to adopt an EMR but I wasn't really sure how it was going to improve our outcomes. I didn't know what to look for in a system; I didn't know what questions to ask (the vendor)." Such uncertainties are not unusual. A national expert pointed out that even nursing homes that are quick to transition from paper to electronic systems "lack a clear understanding of how IT is used specifically in daily processes to improve clinical outcomes." Unfortunately, research suggests that an organization's failure to align the information system with its strategies can result in lost opportunities, wasted resources, and unfavorable performance.[1]

Using IT for clinical decision support (CDS) is one way to concretely link technology to improved process and resident outcomes. CDS tools provide clinical knowledge and resident-specific information to help clinicians make decisions that enhance resident care at appropriate times.[2,3] The tools can also take over some routine tasks, notify clinicians of potential problems, or offer suggestions for consideration.[4,5] The literature provides indications that CDS can significantly improve the quality, efficiency, and costs of health care in some cases.[6]

To help nursing homes effectively link IT with quality improvement (QI), this issue brief highlights a program called On-Time Quality Improvement (On-Time QI), which has been implemented successfully in nursing homes.[7] This program provides clinical decisionmaking tools that were developed to address common nursing home problems. Also included in the program are strategies for tool use and guided facilitation for nursing home front-line staff to improve risk identification and care coordination across disciplines. On-Time QI is designed to be straightforward for clinicians and promote an understanding of how to integrate CDS tools into everyday practice.

On-Time QI calls for a strategic focus on quality improvement goals as part of the implementation of IT, not as an afterthought, so that nursing homes can optimize their technology investments and improve both care delivery and patient outcomes. By working through the lens of quality improvement, the use of information technology becomes more intuitive for front-line staff and makes the role of the system more obvious and meaningful in daily practice. The On-Time Pressure Ulcer Prevention (On-Time PrU) module is part of the broader On-Time QI system that focuses on pressure ulcer healing, falls prevention, and avoidable transfers to hospitals.

On-Time QI for Pressure Ulcers: A CDS Example

Grounded in clinical best practices, the On-Time PrU program was developed in 2003 in collaboration with front-line nursing home

teams from 11 facilities in seven states.[8] It was designed to leverage the knowledge of certified nursing assistant (CNA) staff and promote proactive care coordination and planning using IT. During an 18-month pilot with 11 nursing homes, a standardized set of CNA documentation elements, five CDS reports, and a series of process improvements using CDS tools in daily practice were created, tested, and refined; the goal was earlier identification of residents at high-risk for pressure ulcer development. In 2006, an additional 23 nursing homes across the country implemented On-Time PrU, offering further refinements to the CDS reports and CNA documentation elements that are part of the module. Subsequently, a set of functional IT specifications to support software development of CDS reports by long term care IT vendors was developed in 2008 and is publicly available on the AHRQ website.[7] More than 75 nursing homes in the U.S. have implemented On-Time PrU since 2003.

To implement the On-Time PrU program, which takes about 12 to 18 months, a nursing home must have long term care IT software for, at a minimum, CNA daily documentation. Next, the facility confirms that the vendor software includes the On-Time CDS tools. The facility collaborates with an On-Time QI facilitator, who guides the teams through program implementation, including integration of the five On-Time CDS reports into the daily workflow. (See the box on page 3.) The workflow is reengineered, as needed, with front-line staff collaboration, to promote optimal use of each CDS report.

Nursing homes that implemented the program participated in a national collaborative; this was a forum that provided the opportunity for cross-facility discussion and learning and helped bolster participants' confidence during technology or staff challenges.

All On-Time PrU reports use CNA daily documentation; the reports can display information in a variety of ways to meet the unique needs of various users. Each report is linked to one or more process improvement strategies, enabling facility teams to select strategies for CDS report use that align with their internal processes and structure.

On-Time process improvements are implemented on each long term care nursing unit throughout the facility. Full implementation is defined as implementing four process improvements using the On-Time reports. Following are two examples of PrU process improvements:

- **Identify residents earlier who are at nutritional risk.** Nutritional status is critical for PrU prevention. The On-Time Nutrition Report is used to identify and monitor residents at nutritional risk, having decreased meal intake and/or weight loss, both of which are indicators for high risk of PrU development. Four weeks of meal intake averages are trended for each resident, as well as weight changes for the past 7, 30, 90, and 180 days. Process improvements using the Nutrition Report include a five-minute stand-up meeting held weekly with dietary, nursing, and CNAs. This "huddle" is an example of how a team integrates the use of the Nutrition Report into practice, improves communication across disciplines, and includes CNA staff in collaborative discussions.

- **Identify residents at highest risk for pressure ulcer development.** The Trigger Summary Report uses known risk criteria—meal intake, weight, urinary incontinence, bowel incontinence, and Foley catheter use—to focus staff on high-risk residents to determine if they need additional follow-up, such as referrals, tests, or changes in the care plan. Process improvements using the Trigger Summary Report include identifying high-risk residents on a weekly basis, enhancing rehabilitation team focus on these residents, and monitoring unit-level trends of high-risk triggers.

At a Glance: On-Time QI for Pressure Ulcers

Three Objectives

1. Leveraging knowledge of certified nursing assistant (CNA) staff, who serve as primary informants to licensed staff.

2. Supporting collaborative clinical decisionmaking of a multidisciplinary team using CDS reports that summarize resident information.

3. Establishing practices for proactive risk identification and early intervention to prevent pressure ulcers (PrUs) as part of front-line caregivers' daily work.

Four Categories of Tools

1. Set of CNA documentation data elements developed and refined by more than 50 facilities to standardize and streamline documentation processes and incorporate key measures of clinical best practices for CNAs and care team use.

2. Clinical decisionmaking reports (On-Time CDS tools) are viewed weekly and contain trended information using daily CNA data: (a) Completeness Report for CNA documentation; (b) Nutrition Report; (c) Weight Summary Report; (d) Trigger Summary Report; and (e) Priority Report.

3. Process improvements linked to the use of each On-Time QI report.

4. Tracking tools for each of the reports, to monitor the effectiveness of process improvement efforts.

Three Beginning Steps

1. Establishing an engaged project leadership team that includes the administrator or director/assistant director of nursing.

2. Designating a multidisciplinary clinical team to champion the QI effort including nurse managers, wound nurses, CNAs, staff development, QI, dietitians, rehabilitation, restorative, and social workers.

3. Identifying a facilitator/consultant who is responsible to facilitate the implementation process, mentor clinicians to use data for effective clinical decision-making, and serve as a resource to the facility team and IT vendor.

Three Implementation Phases

1. Preparation includes creating action items related to IT, identifying staff and facilitator resources, and establishing the work plan.

2. Process improvement implementation involves the facility team working with a facilitator to implement On-Time CDS tools and process improvements.

3. Impact monitoring includes gathering and reporting impact data at baseline and ongoing.

Findings

On-Time PrU has been implemented in more than 75 nursing homes as of this writing. The sites include for-profit and nonprofit facilities ranging in size from 50 to more than 500 beds. In order to assess the impact, each facility provided data on pressure ulcer and weight loss outcome measures pre- and post-implementation.

In addition, facilitators gathered feedback from participating nursing home teams, and interviewed stakeholders in New York, Washington, DC, and California, where most of the participating facilities were located. Results from the initial pilot project in 2003–05 and the dissemination efforts taking place from 2006 to the present have been published in two journal articles and several AHRQ Final Reports.[8–11] Administrators, directors of nursing, and QI directors at six nursing homes that participated in On-Time PrU were interviewed to learn where and how the program provided value. They were asked how the program influenced their IT implementation processes, how the programs informed their understanding of the role of IT in clinical decisionmaking, and how the daily practice of their clinical teams was affected.

To put the findings into a broader perspective, national experts and early adopters of IT in long term care were also interviewed for their insights on what is needed to support integration of CDS and QI in long term care and examples of successful implementations. Their responses supported the On-Time program approach and strategies.

The impact of the On-Time program is measured in improved clinical outcomes, clinical processes, and staff experience. For nursing homes fully implementing On-Time PrU, there was marked improvement in the following areas:

- In-house pressure ulcer incidence rates declined in a range of 42% to 55%;

- CMS quality measure for high-risk residents with pressure ulcer declined in a range of 30% to 33%; and

- CMS quality measure for weight loss declined in a range of 12% to 18%.

The findings indicated that high-risk residents were identified earlier and more consistently, and that this affected clinical processes and staff experiences. As stated by a director of nursing in New York, "Prior to On-Time, we were trying to piece resident information together, intervening after the fact, scrambling to connect the information. Now we get information early and we intervene early." Participants noted that the tools go beyond single data points to provide resident trends and offer a broader clinical picture. Following residents over time is therefore a key component of the On-Time implementation. The experts agreed it is important to get people out of thinking "incidence" care and episodic care, and more toward trends and subtle changes in order to be proactive. One director of nursing explained, "We have learned by participating in this project that the resident story isn't in one data point; the story is in the trend. That is where the value is and that is what the On-Time reports show us."

Another benefit participants noted was increased CNA involvement as key informants to licensed staff. Explained a director of nursing in DC, "For our CNAs, we progressed from their role of entering data to looking at reports and then participating in team discussions driven by the information on the reports. They attend every meeting and have a place at the table." A CNA in Washington, DC, said, "Reviewing the reports with the dietitian, nurse, and other CNAs is very helpful. We have a lot of information to share and now we feel like we are being listened to." A director of nursing in New York agreed that, "Communication has improved among the entire multidisciplinary team and CNAs are much more confident interacting with the licensed staff."

Care coordination and proactive care planning improved with the use of CDS tools, which help summarize and synthesize large volumes of data so that information is usable and meaningful to front-line staff. Multiple disciplines were able to review CDS reports together and work collaboratively to make timely decisions; this strengthened relationships among disciplines, according to interviewees. A director of nursing in New York explained, "On-Time reports helped the team to focus discussion on the root cause of trends or changes. Using this approach, the team was not reacting to problems but rather responding to resident changes and risks before the problem occurred—in this case, skin breakdown. Using the reports and process improvements together push us to think and act more in an interdisciplinary way."

The program engages front-line staff and encourages thoughtful consideration on how and where CDS will be embedded into the clinical workflow of each clinician, and emphasizes a shared use of CDS tools across disciplines. In fact, participation in On-Time increased understanding of IT value by front-line clinical teams, some of whom were unaccustomed to using technology. As noted by one director of nursing in Ohio, "We are not computer people. We needed help to implement new processes and think about uses of information." By

engaging front-line clinicians in discussions about specific quality improvement efforts, On-Time shifted the focus away from mere data entry and toward concrete resident outcomes, making the benefits of the new technology more apparent.

Insights from Thought Leaders

Interviews with 15 leading experts helped to frame the context of where and how On-Time can provide value to a nursing home. Nearly all agreed that IT is poorly optimized in nursing homes today; benefits of new technology are largely unrealized as facilities continue to focus technology efforts on compliance and automating paper processes. For the most part, they said, IT is not being leveraged to access tools to support clinical decisionmaking.

Further, they noted, nursing homes tend to use electronic information similar to paper-based information within their existing processes like quarterly minimum data set (MDS) assessments or care planning and monthly QI monitoring. Over time, it is common for nursing homes to realize that re-engineering workflow and using decision-support tools to optimize IT are necessary for good results. The experts foresee successful nursing homes in the future as stepping beyond technology installation and focusing instead on how to integrate IT into clinical workflow, using CDS tools and analytics to proactively guide care coordination across settings. A leading expert commented that where and how IT is used to improve care processes and impact resident outcomes "is critical to nursing home survival."

However, the experts stressed that health IT is valuable only to the extent that it provides information to the clinicians in a usable format. This point, they noted, is well-established in the literature. One respondent remarked, "If the clinician has to go through too much information then they get paralyzed. Information needs to be presented in a way that makes sense to the clinician. The On-Time reports do that."

The experts emphasized the importance of facilitation in program implementation. The Office of the National Coordinator (ONC) stated, "Facilities cannot simply turn on the system and expect IT to lead to improved process and outcome measures. Technology alone will not lead to improved quality and new IT tools will not be used just because they are available in the system. Here, with On-Time, you have a program that offers CDS tools and strategies for use." One DC stakeholder noted that On-Time serves as "a path toward IT use and adoption. Through guided facilitation, facilities learn how to leverage IT to impact quality. Nursing homes won't get there without help; there are too many competing priorities, tight budget, staff turnover, reduced reimbursement from Medicare and Medicaid."

The experts emphasized that successful use of IT to support clinical decisionmaking requires a seamless integration into clinical workflow. One expert said, "Too often IT operates as a static product causing disruptions and requiring workarounds to existing workflow in order to use." Because On-Time integrates IT into the clinical workflow, staff members learn to think of the technology as a dynamic support that can adapt to their changing needs.

Finally, the national experts emphasized the importance of linking quality improvement with IT as a business imperative, as the link between QI and payment becomes stronger. Near-term possibilities affecting the long term care marketplace include: bundled payments covering hospital stay, physician care, and 30 days post-discharge; and non-reimbursement for "never events" such as pressure ulcers and falls. These potential payment changes intensify the need for consistent and reliable processes that follow best practices and deliver quality outcomes. A leading expert said, "Remember that you are building a data system for the purpose of care management, not for the purpose of eliminating paper documentation."

Conclusion

The principal learning from the On-Time PrU experience is that the benefits of IT for a nursing home extend well beyond the elimination of paper documentation, remote availability of information, and efficient workflow. It illustrates how IT-supported clinical decisionmaking, care coordination, and proactive care planning can result in improved resident outcomes.

As nursing homes gain a better understanding of the value of health IT using CDS tools combined with process improvement strategies like On-Time, there is increased likelihood of broader support for technology adoption. Facilities that have implemented On-Time PrU are positioned to make better decisions about IT implementation, are more informed about the potential of CDS tools, and therefore are more willing to adopt new tools and change existing processes in the interest of improved care. Although implementing IT is not an immediately appealing prospect for many nursing home staff members, leveraging the technology to better manage resident care is desirable to nursing home administrators and front-line staff alike.

It is important to note that the widespread adoption of information technology and CDS is affected by factors external to nursing homes. For example, despite recognized need for IT implementation in clinical settings, long term care providers are not included in current federal government funding for IT support. One nursing home CEO warned that, the potential of IT in long term care "is doomed to failure if nursing homes do not receive incentive dollars." Experts agree that many nursing homes are in a "wait and see" mode regarding IT adoption. In all On-Time implementation efforts to date, grant dollars have been provided to nursing homes to offset the costs of buying and implementing the new technology. If the implementation of On-Time and comparable CDS tools is to become a new industry standard in long term care, more funding will need to be allocated specifically for this purpose.

Fortunately, a solid and growing foundation of CDS use has been established for nursing homes. The On-Time QI program is expanding beyond pressure ulcer prevention to pressure ulcer healing, falls prevention, and avoidable transfers to emergency departments and hospitals. Furthermore, collaboration with long term care IT vendors has expanded over the years and is expected to continue to do so. Currently, ten long term care IT vendors have integrated On-Time requirements into their software, citing their confidence in the stability and wide applicability of the On-Time requirements.[12] As one vendor explained, "When it comes to requirements, we want to be sure the customizations are reusable." Another vendor noted, "We didn't have to deal with copyright issues since requirements were in the public domain; it was an easy decision for us."

The continued implementation and expansion of CDS used at the front-line will allow nursing homes to build a track record of effective IT use, which can expand their understanding of how and where IT can be leveraged to improve care.

AUTHORS

Sandy Hudak, MS, RN, and Siobhan Sharkey, MBA, principals, Health Management Strategies, Inc., Austin, TX

CONTRIBUTORS

Susan Horn, PhD, senior scientist at Institute for Clinical Outcomes Research and vice president for research at International Severity Information Systems, Inc., Salt Lake City, UT

William Spector, PhD, senior social scientist, Agency for Healthcare Research and Quality, US Department of Health & Human Services, Rockville, MD

Michal Engleman, PhD, Department of Sociology at the University of Chicago, Chicago, IL

ABOUT THE FOUNDATION

The California HealthCare Foundation works as a catalyst to fulfill the promise of better health care for all Californians. We support ideas and innovations that improve quality, increase efficiency, and lower the costs of care. For more information, visit us online at www.chcf.org.

ENDNOTES

1. Challenges and Barriers to Clinical Decision Support (CDS) Design and Implementation Experienced in the Agency for Healthcare Research and Quality CDS Demonstrations. Contract Number: 290-04-0016. Prepared by: AHRQ National Resource Center for Health Information Technology. Authors: June Eichner, MS, Maya Das, MD, JD, NORC at the University of Chicago; AHRQ Publication No. 10-0064-EF March 2010.

2. Osheroff, JA, Pifer, EA, Teich, JM. *Improving Outcomes with Clinical Decision Support: An Implementer's Guide.* Chicago: Healthcare Information and Management Systems Society (HIMSS), 2005.

3. Buntin, MB, Burke, MF, Hoaglin, MC, Blumenthal, D. "The Benefits of Health Information Technology: A Review of the Recent Literature Shows Predominantly Positive Results." *Health Affairs,* 30, no.3 (2011): 464–471.

4. Osheroff, JA. (2009). *Improving Medication Use and Outcomes with Clinical Decision Support: A Step-by-Step Guide.* Chicago, IL: The Healthcare Information and Management Systems Society.

5. Chaudhry, B, Wang, J, Wu, S, et al. "Systematic Review: Impact of Health Information Technology on Quality, Efficiency, and Costs of Medical Care." *Annals of Internal Medicine* May 16 2006;144(10):742–752.

6. Booz Allen Hamilton. Evaluation Design of the Business Case of Health Information Technology in Long-Term Care: Final Report. Washington, DC: US Department of Health and Human Services, ASPE Office of Disability, Aging and Long-Term Care Policy. July 2006. Available at: www.aspe.hhs.gov.

7. On-Time QI was developed with funding from the Federal Agency for Healthcare Research and Quality (AHRQ), in collaboration with the California HealthCare Foundation. See: www.ahrq.gov/RESEARCH/ontime.htm.

8. Horn, SD, Sharkey, SS, Hudak, S, Gassaway, J, James, R, Spector, W. (2010). Pressure ulcer prevention in nursing homes: A pilot study implementing standardized nurse aide documentation and feedback reports. *Advances in Skin & Wound Care,* 23(3), 120–131.

9. AHRQ Final Reports summarized on website, www.innovations.ahrq.gov. Last accessed February 14, 2011.

10. Sharkey, SS, Hudak, S, Horn, SD. (2011, January). *On-Time Quality Improvement Manual for Long-Term Care Facilities.* AHRQ Publication No. 11-0028-EF. Rockville, MD: Agency for Healthcare Research and Quality, www.ahrq.gov.

11. Sharkey, SS, Hudak, S, Horn, SD, Spector, W. (2011). Leveraging certified nursing assistant documentation and knowledge to improve clinical decision making: The On-Time quality improvement program to prevent pressure ulcers. *Advances in Skin & Wound Care,* 24(4), 182–184.

12. IT vendors that have integrated On-Time requirements as of this writing: Resource Systems-Care Tracker; Optimus EMR; LINTECH; Melyx Corporation; Reliable Systems; SigmaCare; American Data; Healthcare Systems Connection; PointClickCare; and HealthMEDX.

Appendix A: Interviewees

On-Time Implementers and IT Vendors

Douglas Tucker, NHA, Administrator
Country Villa Woodman, CA

Lori Cooper, NHA, MPA, Administrator
Stonebrook Healthcare Center, CA

Janice Johnson, RN, BSN, Director of Nursing
Bonnie Williams, MS, BSN, RN, Director of QI
Carroll Manor Nursing and Rehabilitation Center, DC

Sonia DeSouza-Brown, RN, Assistant Director of Nursing
Johanna Graham, RN, Nursing Rehabilitation/
    Wound Care Coordinator
Lynette Harry-Rutherford, RN, Inservice/
    Informatics Coordinator
Gurwin Nursing and Rehabilitation Center, NY

Sandra Smith, LMSW, CNHA Administrator
Chris Urbano, RN, Director of Nursing
Leslie Campbell, RN, Nurse Unit Manager
Seton Health Schuyler Ridge, NY

Anita Peffer, Director of Patient Services
Robin Miller, RN, Registered Nurse Assessment Coordinator
Hennis Care Center, OH

Beth Dichter, PhD
New York Department of Health

Veronica Damesyn-Sharpe, MHSA
DC Health Care Association

Megan D'Angelo, Senior Director,
    SNF/AL Clinical Product Development
PointClickCare

Mauricio Vejar, VP IT
Country Villa Health Services
HealthMEDX

Heike Burk, RN, Client Services
Rick Zirbel, Software Developer
American Data

Thought Leaders:
CEOs and CIOs of Long Term Care Organizations

Michael Torgan, President
Country Villa Health Services

John F. Derr, RPh, Strategic Technology
Golden Living LLC

Peter Kress, MA, Vice President and Chief Information Officer
ACTS Retirement-Life Communities, Inc.

Larry Wolf, Health IT Strategist
Kindred Healthcare

Alan Crommett, MSHSA, Chief Information Officer
Skilled Healthcare

Thought Leaders: Stakeholders

Jim Koontz, MBA
Quality Care Health Foundation (QCHF)

Mary Fermazin, MD, MPA
Vice President, Health Policy and Quality Measurement
Chief Medical Officer, Health Services Advisory Group, CA

Kim Harris-Salamone, PhD, MPA
Vice President, Health Information Technology
Health Services Advisory Group (HSAG)

Jennie Harvell, MEd, Senior Policy Analyst
Department of Health and Human Services
Office of the Assistant Secretary for Planning and Evaluation
    (ASPE/HHS)

Janhavi Kirtane, MBA
Elizabeth Palena Hall, RN, MIS, MBA
Office of National Coordinator (ONC)

Majd Alwan, PhD, Vice President
LeadingAge / Center for Aging Services Technologies (CAST)

Rebekah Gardner, MD
Quality Partners of Rhode Island (QPRI)

Brent James, MD, Chief Quality Office
Intermountain Health Care

Mary Jane Koren, MD, MPH
Commonwealth Foundation