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A national collaborative approach to reduce catheter-associated urinary tract infections in nursing homes: A qualitative assessment

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Abstract

Background—Reducing health care-associated infections (HAIs), such as catheter-associated urinary tract infection (CAUTI), is a critical performance improvement target in nursing homes. The Agency for Health-care Research and Quality Safety Program for Long-term Care: Health Care-Associated Infections/Catheter-Associated Urinary Tract Infection, a national performance improvement program, was designed to promote implementation of a CAUTI prevention program through state-based or regional collaboratives in more than 500 nursing homes across the United States.

Methods—Qualitative interviews were conducted with 8 purposefully selected organizational leads (who led implementation activities for a group of facilities) and 8 facility leads (who led implementation activities at a given facility) to understand implementation successes and challenges and experiences of participants involved in the program. Key themes were identified using a rapid analysis approach.

Results—Key themes related to general perceptions, changes due to program participation, and factors influencing program implementation were identified. In general, the program was viewed positively by organizational and facility leads with changes in catheter care practices, staff empowerment, and improvements in knowledge identified as benefits. Implementation challenges

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included the time required for program start-up as well as issues with staff and physician support, logistic barriers, and staffing turnover.

Conclusions—Despite some challenges, the observed program success and positive views of those participating suggest that collaboratives are an important strategy for providing nursing homes with enhanced expertise and support to prevent HAIs and ensure resident safety.

Keywords

Infection prevention; Quality improvement; Long-term care; Resident safety; Qualitative interviews

Enhancing resident safety is a major focus area for the more than 15,000 nursing homes across the United States.¹ Food safety, medication management, and infection control are frequently cited as top safety concerns.² Estimates suggest that on any given day approximately 12% of the 1.5 million nursing home residents in the United States may have an infection.^{3,4} Additionally, nearly one-quarter of the postacute population who become nursing home residents return to a hospital due to an infection, accounting for more than \$4 billion in additional health care costs per year in the United States.⁵

Recognizing the importance of preventing infections in nursing homes, the 1987 Omnibus Budget Reconciliation Act mandated that each nursing home have an infection prevention and control (IPC) program.⁶ Updates to this Act encouraged more robust IPC programs,⁷ and prevention of health care-associated infections (HAIs), including catheter-associated urinary tract infection (CAUTI), in long-term care facilities was identified as a national priority in 2013.⁸ More recently, implementation of an antibiotic stewardship program is required in nursing homes that receive Medicare and Medicaid funding.⁹

Evidence suggests that nursing homes are responding to these national initiatives. A recent study found that more than 70% of nursing homes reported having an experienced infection preventionist (IP) and a committee that reviewed HAIs.¹⁰ Yet, challenges exist. Nursing home IPs often have limited time to devote to infection control,¹⁰ and many receive no formal training in infection prevention.¹¹ Moreover, identified knowledge gaps related to key aspects of IPC exist among both licensed and unlicensed staff.¹² Consequently, innovative strategies to strengthen IPC activities in nursing homes are critically needed.

The Agency for Healthcare Research and Quality (AHRQ) Safety Program for Long-term Care: Health Care-Associated Infections/Catheter-Associated Urinary Tract Infection was a national performance improvement program designed to reduce CAUTI in nursing homes.¹³ This multimodal program, which focused on implementing CAUTI prevention practices and improving safety culture, teamwork, and communication, as well as general IPC practices and antibiotic stewardship, resulted in a substantial reduction in CAUTI among a cohort of more than 400 community-based nursing homes.¹⁴ We conducted a qualitative assessment to understand implementation successes and challenges and experiences of participants involved in the program. In this paper, we describe the key findings to inform nursing home and IPC leaders as well as those engaged in quality improvement as we work together to enhance IPC in nursing homes.

METHODS

Study setting

From March 2014–September 2016, the AHRQ Safety Program for Long-term Care was available for implementation in all states, the District of Columbia, and Puerto Rico through state-based or regional collaboratives modeled, in part, after a successful program to reduce CAUTI in acute care hospitals.¹⁵ A detailed overview of the program is published elsewhere.¹³ The AHRQ program was coordinated by a national-level project team. This team recruited organizational leads, which included representatives from state hospital associations, professional organizations, national partners from long-term care corporations, organizations with expertise in performance improvement, and the Department of Veterans Affairs, to work directly with nursing home facility teams to implement the program. The nursing homes were asked to identify a facility leader and a multidisciplinary team that would be responsible for implementing the program. Specific activities for which the national team, organizational leads, and facility leads were responsible are shown in Figure 1. A total of 568 nursing homes were recruited for full program implementation, of which 433 actively participated and 135 withdrew.

Design and recruitment

We conducted a qualitative study to understand the opinions and experiences of organizational and facility leads during program implementation. During June and July 2016, semistructured telephone interviews were conducted with 8 of 33 organizational leads who were part of the contracted project team, and 8 nursing home facility leads. Interviewees were selected using a mix of purposeful and convenience sampling techniques. Given their role in the program, organizational leads were purposefully sampled. However, to ensure a range of experiences, they were recruited from different states. Organizational leads were asked to identify a convenience sample of facility leads to invite for interviews. To capture various experiences, facility leads were stratified based on their participation (high or low) in program activities as determined by data submission rates and attendance at educational webinars. We interviewed both organizational and facility leads, given that the organizational leads had unique insights and perspectives because they oversaw a group of facilities, whereas each facility lead provided in-depth information that was specific to his or her facility only. Interviews were scheduled and conducted by several qualitative assessment team members based on facility and organizational lead availability.

Data collection and analysis

An interview guide was developed to solicit the interviewees' opinions about program implementation, program-related experiences and practice changes, and suggestions for improvement (Appendix). Interview questions used for both groups were similar; however, not identical due to their unique roles in the program. Interviews were approximately 30 minutes in length, audiorecorded, and transcribed verbatim.

The analysis process focused on key themes as identified using a rapid analysis approach.¹⁶ This type of approach is especially useful when the questions being addressed are relatively targeted and more rapid feedback about a program or implementation process is desired.

Initial themes were identified from the interview guides and a coding template was developed. Using this template, 5 team members analyzed all transcripts for key findings by theme. The analysts convened to review and confirm agreement of key findings under each theme before preparing summaries. To compare and contrast experiences, data were aggregated based on role and summaries were created (thus, 1 summary was written based on organizational leads' experiences and 1 based on facility leads' experiences). Additional analysts, who also read the transcripts, then reviewed the summaries to confirm accuracy and completeness of the findings.

The study was reviewed by the University of Michigan and Health Research and Educational Trust institutional review boards and determined to not meet the regulatory definition of research involving human subjects. The funding agency had no role in the design and conduct of this qualitative assessment study; collection, management, analysis, and interpretation of the data; preparation or approval of the manuscript; and decision to submit the manuscript for publication.

RESULTS

Overall, both the organizational and facility leads indicated that the program was beneficial. This general perception is perhaps best described by an organizational lead who stated: "... it's an industry that so desperately needs these resources, it was a real pleasure to be able to be a part of [the program]" (Organizational lead interview 6). A specific benefit identified by both groups was greater staff empowerment. Staff felt more knowledgeable and thus, empowered to speak with physicians and other team members regarding the necessity of catheters and the ordering of urine cultures.

...they found their voice to be able to say, "You know what? What else can we do because this is really, I don't believe, the course for the resident." Empowerment I think was the biggest take-away that's going to allow them to take any project in the future with a bit better ease. (Organizational lead interview 3)

The most common critique from both organizational and facility leads was the amount of time required to complete the implementation requirements especially during program startup, which was at times overwhelming.

The beginning was a little fast-paced, and staff were getting a little burned out on all the questionnaires and education that has to be done in such a short amount of time. (Facility lead interview 7)

Changes as a result of participation

In addition to being generally positive about the program, specific changes were also described by both groups. For example, organizational leads reported increases in evaluation of early catheter removal, increased awareness of CAUTI prevention, increased willingness to modify current practice, and willingness to educate other team members. Facility leads reported that staff were more comfortable asking physicians about the need for indwelling catheters, use of antibiotics, and urine cultures. Several facilities reported that too many urine cultures were being ordered by physicians and that staff were not collecting urine

samples correctly. Through the program, the leads reported that staff became better equipped to identify CAUTI symptoms, collect urine cultures appropriately, and provide better catheter care in general. In addition, increased use of catheter alternatives and the development of policies to encourage their use were reported by many of the facilities.

Some facility leads also described plans for ongoing work, including sustaining best practices through monitoring and randomly auditing staff on insertion and maintenance procedures. In addition, several facilities planned to use the CAUTI reductions observed from this program to focus on reducing other facility-acquired infections. For example, one facility was working to educate residents and families about the importance of handwashing to prevent the spread of infection. Another facility was educating all staff, including foodservice and cleaning staff, on CAUTI prevention. They believed all staff members have a role to play in prevention.

We included housekeeping. We included the kitchen staff, who may not even have any knowledge of most of this stuff, but we included them because they could see somebody rolling down the hall with their catheter dragging on the floor. We included them so they could go to the nurse and say, “That’s not supposed to be that way.” (Facility lead interview 3)

Factors that influenced implementation

Although the perceived benefits of program participation are important, the organizational and facility leads also identified several common factors that influenced program implementation related to staff and physician support, logistical barriers, and staffing (Table 1).

Staff and physician support—Organizational leads received feedback from facility leads that program implementation was not supported by all staff and constant staff turnover was a barrier to sustainability. Organizational leads also stated that several facilities had difficulty obtaining physician support for the program and that sometimes physicians did not realize the value or benefits of supporting program implementation.

Facility leads confirmed the pushback they received from some clinicians. For staff, some leads believed that this program was “burdensome” and required too much time. It was also difficult for some floor nurses to incorporate program requirements, such as educational activities, into their resident care duties. Some physicians seemed not to buy-in to the importance of the program and continued to request the use of indwelling catheters and order urine cultures. In addition, some physicians continued to write standing orders that Foley catheters be changed every 30 days. Facility leads stated that physician buy-in was crucial to success and to implementing changes in resident care practices.

One of them [floor nurse] was educating our physician that we do not need to change Foley’s once a month. That was kind of a repeated thing that I had to try and drill into him in particular. We have several here, but one of them is really an old school physician, and so he is having a little bit harder time swallowing that. I think I finally got him where he doesn’t give that order any more. (Facility lead interview 2)

Logistic barriers—A few organizational leads described logistic barriers to the implementation plan. For example, because organizational leads were overseeing several facilities within a state, the physical distance between facilities prohibited in-person collaboration. Although organizational leads would have preferred more in-person contact, facility leads believed that the collaboration, which often occurred through coaching calls, was helpful.

A variety of technologic problems were also identified. Facilities were asked to complete electronically administered staff knowledge assessments and a safety culture survey. Some facilities did not have computers for staff to use, which resulted in facility leads printing the surveys for staff to complete by hand and then having to enter their responses electronically.

Education was also a major component of the program with many online presentations and educational activities. However, many facility leads struggled with staff attendance. Barriers to online education and learning modules included time constraints, lack of technology such as projectors, and lack of staff coverage. Some facility leads creatively adapted by participating in the educational modules or lessons, printing out the slides, and then teaching their staff one-on-one to ensure consistent messaging throughout the facility. Education being presented to staff often contained terms that were unfamiliar to them and required additional instruction and time.

I would say maybe 30% of our nursing staff are relatively new nurses, maybe only been nursing for 2–3 years at the most. A lot of the terminology, even the word CAUTI, was new to them. It's starting a lot with the basics. (Facility lead interview 5)

Staffing—Staffing in general, as previously mentioned, was an issue identified at both the organizational lead and facility level. Staff turnover at the facility level was a common challenge organizational leads attempted to address. Facility leads frequently mentioned the time and effort required to re-educate new staff. Some facility leads reeducated staff on a one-on-one basis and others relied on a peer-to-peer model, in which staff train their colleague(s), especially to educate newer employees.

Some organizational leads noted that staffing at their level was not always adequate to meet program demands and facility needs. Their roles often entailed acting as intermediaries, translating instructions for program implementation, and conveying information between the national team and the participating facilities. In addition, they served as coaches providing feedback, encouragement, and support while creating safe spaces in which the facility leads could discuss program concerns and ask questions. However, these duties had to be performed within the context of their everyday job duties.

Facility leads new to their positions often found it hard to gain buy-in, mainly due to a lack of relationship with the staff. When trying to update facility practices, a trusting relationship with staff and clinicians was important for gaining the support of those involved in direct resident care. When facility leads reported having strong relationships with team members in the facility, there was a sense of excitement and greater collaboration among all staff participating in the program. Conversely, when the facility lead noted weak or nonexistent

relationships, then staff would be completely disengaged or would only dedicate minimal time and energy toward completing the program goals.

I think it would have been better if I hadn't been brand new [to my role]. I was still trying to learn my role. The results I got with the staff were iffy because I didn't get very much input from the staff. I did get some, but like I said, if it had been now when I'm more experienced in the role I think I would have done better. (Facility lead interview 1)

DISCUSSION

Preventing infections and reducing infection risk among nursing home residents is a national priority.⁸ In addition to recent requirements regarding antibiotic stewardship,⁹ a Joint Commission National Patient Safety Goal, effective January 1, 2017, requires accredited nursing care centers to “implement evidence-based practices to prevent indwelling CAUTIs.”¹⁷ Nonetheless, implementing evidence-based practices whether focused on CAUTI prevention or other aspects of resident safety can be difficult. This is especially true in settings with limited IPC or quality improvement resources. Our findings highlight the potential promise but also challenge of using a large-scale, national collaborative approach to promote the use of evidence-based IPC practices in nursing homes. Moreover, these results highlight some important considerations and strategies for strengthening IPC activities in this setting.

Collaboratives, a popular approach for promoting quality improvement in health care settings, have successfully reduced infection rates in acute care hospitals.^{15,18–20} Although less common in nursing homes, there are examples of successful collaboratives focused on reducing depressive symptoms,²¹ pain,²² and falls²³ among nursing home residents. Similarly, this national collaborative, although significantly larger in scale than these other initiatives, resulted in a substantial reduction in CAUTI rates among participating community-based nursing homes.¹⁴ Among the positive benefits identified by both organizational and facility leads were specific changes in catheter care practices and staff empowerment. Indeed, improved knowledge, resulting from access to evidenced-based practices and practical tools, was considered a critical element in encouraging staff to discuss with physicians about when catheters and urine cultures may or may not be warranted. This finding also suggests an important opportunity for IPs and the role they can play in the development of frontline staff to not only promote infection related practice changes, but also instill a more robust resident-safety culture in nursing homes.

Although generally viewed as a success, our qualitative assessment also identified challenges with using a collaborative approach in nursing homes. Some challenges, such as the time and effort required to complete certain program elements and difficulty with engaging various staff, have also been found in other studies of collaboratives, both in nursing homes and acute care hospitals.^{22,24} Among the issues more unique, either to the setting or this specific program, is the substantial turnover of staff in most nursing homes and thus a continual need for ongoing educational programming. A lack of infrastructure and resources to support program delivery was also noted at some facilities. As a national

collaborative, the education and other program elements were designed for Web-based or electronic delivery. However, some participating nursing homes lacked the technology resources to support this type of programming and required development of alternative methods for disseminating program educational materials.

Taken as a whole, coupling program benefits and challenges, this study suggests that certain adaptations might further enhance the effectiveness of nursing home IPC performance improvement activities, particularly using a collaborative approach but also as a single site initiative. This includes the use of a more flexible curriculum with multiple modes of delivery and materials that can be easily modified for quick and ongoing education of a variety of staff. The need for flexible education materials and methods is further reinforced by a qualitative study of barriers to infection prevention for certified nursing assistants in nursing homes,²⁵ which identified staffing and knowledge as well as language and culture as important issues for this group of health care workers. Although this could be viewed simply as a challenge, it also suggests another important consideration and opportunity for IPs to ensure that information is delivered in a format that best addresses the characteristics and needs of staff at their local facility.

Innovative strategies for providing targeted and continuing support for facilities can also be helpful in addressing issues related to logistic barriers and some of the staffing-related challenges. In fact, facility peer-to-peer coaching and resources from organizational leads that were more specific to a given facility were both identified as potential opportunities for program improvement. Although peer-to-peer coaching was discussed in the context of this specific program, capitalizing on this idea could also be a key strategy for enhancing IPC and supporting nursing home IPs more broadly, even without being part of a collaborative effort. Networking amongst IPs whether locally, regionally, across nursing homes, or across settings (eg, acute care and nursing home) can promote knowledge sharing as well as provide assistance and encouragement, particularly for those who are in more resource limited or rural locations.²⁶

This work has some limitations. This qualitative assessment was conducted to understand the experience of nursing homes that participated in the AHRQ Safety Program for Long-term Care. Although our findings do not generalize beyond this group, our assessment provides detailed information for others who may be interested in undertaking similar initiatives. Interviewees were selected using purposeful and convenience sampling techniques. Although this strategy could potentially lead to respondent bias, such as those with more favorable views agreeing to participate, we have no reason to suspect this was the case. Also, the sample of facility leads included those from facilities with both high and low levels of program participation.

CONCLUSIONS

These qualitative assessment findings support and expand our understanding of the quantitative reduction in CAUTIs observed among community-based nursing homes participating in the program.¹⁴ Both organizational and facility leads identified critical benefits, such as improvements in IPC knowledge, that empowered staff and contributed to

changes in practice. This study highlights the value of using a collaborative approach for providing external support as well as several potentially important strategies for strengthening and more effectively promoting IPC activities in nursing homes.

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APPENDIX

FACILITY INTERVIEW GUIDE

General Information

- 1 Please describe your role in your organization.
- 2 Please describe your overall experience in the project.
 - a. How would you describe your staff's overall experience in the program?
 - i. Any tools, resources or programming that they particularly enjoyed?
 - ii. Any part of the project that they did not enjoy, was challenging, or not necessary?
- 3 Looking back over the duration of the project, if you could change one thing (anything) what would it be?
- 4 What advice would you give other long-term care facilities that are trying to reduce CAUTIs?
- 5 Upon joining this project, what practice changes did you want to see demonstrated as a result of your facilities' involvement?
 - a. Describe any actual changes in practice you observed among your team.
 - b. What changes do you plan to encourage and sustain over time?
 - i. Why? How do you plan on sustaining these changes?
- 6 At the beginning of the project, what did you believe the largest barriers or challenges would be for the staff to implement practice changes to reduce CAUTIs?
 - a. What were the largest barriers or challenges? How did you and the staff overcome these barriers?
 - b. Probe: Were there any surprises or unexpected challenges and how did you handle these?

Sub-Area Evaluation

- 7 What areas or practices do you believe your staff improved the most in, in relation to CAUTI reduction? (e.g., catheter management, surveillance, infection prevention, care plan)
 - a. What influenced these positive changes?

Catheter Management Changes

- 8 Please describe any changes in catheter management practices that occurred due to this project.
- a. *If positive change*, what influenced this change? Any specific plans to ensure this improvement post-project?
 - b. *If no change*, what was the largest barrier or challenge?
 - i. In retrospect, what do you think could have been done differently, either at the facility level or program level, to ensure improvement in catheter management?

Surveillance

- 9 Please describe any changes in surveillance practices that occurred due to this project. (e.g., designated collection paperwork, protocol implemented)
- a. *If positive change*, how did these changes benefit or improve the reduction of CAUTIs for your residents?
 - i. What plans do you have in place to sustain these changes or improvements long-term?
 - b. *If no change*, please describe why no change occurred. (Probe: be specific, certain barriers or challenges or where policies already in place)
 - i. What do you believe could have been done differently, either at the facility level or program level, that could have helped improve surveillance practices?

Infection Prevention

- 10 What changes to CAUTI and infection prevention practices did you or your team make?
- a. Did these reduce or positively impact CAUTIs in the facility?
 - i. *If positive*, how do you plan to sustain these practices?
 - b. What barriers and challenges did you encounter when trying to reduce CAUTI rates?

Infection Prevention Training

- 11 Please describe specific changes in infection prevention trainings offered to the facility staff. (e.g., hand hygiene, catheter insertion, antimicrobial stewardship)
- a. Why were these changed or updated?
 - b. Have you evaluated the effectiveness of these trainings?
 - i. *If yes*, how and what was the result?

- ii. *If no*, do you believe these trainings were effective? Any specific evidence?

- 12 Thinking of all the practice changes just discussed, how have you used any of these practice changes towards reducing other HAIs?

Overall Experience

- 13 Please describe your overall relationship with your state-level or organizational support.
- 14 What personal changes in your clinical practice or resident care did you make as a result of this project?
- 15 Do you have any closing comments or questions?

ORGANIZATIONAL LEAD INTERVIEW GUIDE

Basic Information and Impression of Initiative

- 1 What is your general impression of the CAUTI-LTC project? What have been some of your personal takeaways from this program?
 - a. What do you feel went well for you? For your facilities?
 - b. What would you do differently? Please tell me what aspects of the program were most beneficial for you. (e.g., knowledge on best practices, involvement in HAI reduction, relationships)
- 2 When you joined this project, what facility changes did you want to see demonstrated as a result of involvement?
 - a. What was the largest barrier or challenge that you believe the facilities faced in the project?
- 3 How did you see your role in supporting the LTC or NH facilities?
 - a. What was the largest barrier or challenge that you faced?
 - b. Did any moment or event in the project surprise you? Please describe.

Evaluating Sub-Areas

- 4 What was your experience in leading facilities through this program and project topics?
 - a. What was most important to your success as a coach?
 - b. What could have been done differently or done more effectively?
- 5 How useful were the project resources? (e.g., website, data collection process, newsletter, calls)
 - a. What tool or resource would you say you utilized the most?
 - b. What tool or resource would you say was utilized the least?

- c. Are there any resources or tools that you would have liked to have had included or offered?
- 6 Thinking over all the practice changes and sub-areas that the project covered, what area would you say that the facilities were most engaged or interested in?
 - a. What sub-area or practice change was the hardest for you or the facility to implement?
 - b. What area or practice change would you have liked to see included that wasn't?
- 7 Of all the practice changes implemented in the facility, which do you see lasting long-term or being utilized post-completion of the project?

Overall Experience

- 8 Overall, how would you define success, in terms of the project?
 - a. Do you believe the project was successful?
 - i. *If yes*, what helped lead to that success?
 - 1. What were the challenges or barriers that you had to overcome to be successful?
 - 2. How did you address these? (Probe: Which tools or resources were used? Did you reach out for support?)
 - ii. *If no*, what were your top barriers to being successful?
 - 1. What do you think could have helped you to overcome these barriers to be successful?
- 9 How was your support from the national project team?
 - a. How was your support by your state-level or facility-level team?
- 10 Looking back over the duration of the program, if you could change one thing (anything), what would it be?
- 11 What advice would you give others who are trying to coach or lead facilities to improve a culture of safety and reduce HAIs in LTCs?
- 12 Do you have any closing comments or questions?

Thank you very much for your time and thoughtful input.

Fig 1.

Roles and responsibilities. *The national project team was composed of members from the University of Michigan, Abt Associates, the Association for Professionals in Infection Control and Epidemiology, Baylor College of Medicine, Contrast Creative, Qualidigm, and the Society of Hospital Medicine; the Centers for Disease Control and Prevention (CDC) and other federal agencies were interagency partners.

Table 1

Common factors influencing implementation with exemplar quotes

Factor	Organizational lead exemplar	Facility lead exemplar
Staff and physician support	We are struggling with providers in some places, so the staff and the facilities seem to be on board, but they are still working with providers and we're working on that. (Organizational lead interview 2)	The largest barrier was, "This is the way we've always done it." I would hear that every time I turned around. (Facility lead interview 3)
Logistic barriers	Getting all the logistics worked out was an initial barrier because we had things kicking off. The skills survey, they weren't able to do it online because you, of course, need several computers to accomplish this that connect to the internet, so small logistics things starting off. (Organizational lead interview 3-2 interviewees)	Most of the time, the education that we did, we did not have a room with a computer, and a projector, and a screen where we could look at the presentation slides. I almost always made a hard copy and went through it with them, like one-on-one inservice. (Facility lead interview 7)
Staffing	No, the biggest barrier was the need for repeated education because of staff changes, and that is a big challenge, in all the hospital-acquired conditions. (Organizational lead interview 4)	I think it would need continuous education because we have a really high turnover in staff. (Facility lead interview 1)