Comparing Catheter-Associated Urinary Tract Infection Prevention Programs Between Veterans Affairs Nursing Homes and Non–Veterans Affairs Nursing Homes

Lona Mody, MD, MSc;1,5 M. Todd Greene, PhD, MPH;2,6 Sanjay Saint, MD, MPH;2,3,6 Jennifer Meddings, MD, MSc;3,6,7 Barbara W. Trautner, MD, PhD;9,10 Heidi L. Wald, MD, MPH;11 Christopher Crnich, MD, PhD;12,13 Jane Banaszak-Holl, PhD;8,14 Sara E. McNamara, MPH, MT(ASCP);5 Beth J. King, RN, BSN, MA;4 Robert Hogikyan, MD, MPH;1,3,5 Barbara S. Edson, RN, MBA, MHA;15 Sarah L. Krein, PhD, RN

OBJECTIVE. The impact of healthcare system integration on infection prevention programs is unknown. Using catheter-associated urinary tract infection (CAUTI) prevention as an example, we hypothesize that US Department of Veterans Affairs (VA) nursing homes have a more robust infection prevention infrastructure due to integration and centralization compared with non–VA nursing homes.

SETTING. VA and non-VA nursing homes participating in the AHRQ Safety Program for Long-Term Care collaborative.

METHODS. Nursing homes provided baseline information about their infection prevention programs to assess strengths and gaps related to CAUTI prevention via a needs assessment questionnaire. Nursing homes provided baseline information about their infection prevention programs to assess strengths and gaps related to CAUTI prevention via a needs assessment questionnaire. Robust infection prevention infrastructure due to integration and centralization compared with non–VA nursing homes. VA nursing homes reported more hours per week devoted to infection prevention-related activities (31 vs 12 hours; \(P < .001\)) and were more likely to have committees that reviewed healthcare-associated infections. Compared with non-VA facilities, a higher percentage of VA nursing homes reported tracking CAUTI rates (94% vs 66%; \(P < .001\)), sharing CAUTI data with leadership (94% vs 70%; \(P = .014\)) and with nursing personnel (85% vs 56%, \(P = .003\)). However, fewer VA nursing homes reported having policies for appropriate catheter use (64% vs 81%; \(P = .004\)) and catheter insertion (83% vs 94%; \(P = .004\)).

RESULTS. A total of 353 of 494 nursing homes from 41 states (71%; 47 VA and 306 non-VA facilities) responded. VA nursing homes reported more hours per week devoted to infection prevention-related activities (31 vs 12 hours; \(P < .001\)) and were more likely to have committees that reviewed healthcare-associated infections. Compared with non-VA facilities, a higher percentage of VA nursing homes reported tracking CAUTI rates (94% vs 66%; \(P < .001\)), sharing CAUTI data with leadership (94% vs 70%; \(P = .014\)) and with nursing personnel (85% vs 56%, \(P = .003\)). However, fewer VA nursing homes reported having policies for appropriate catheter use (64% vs 81%; \(P = .004\)) and catheter insertion (83% vs 94%; \(P = .004\)).

CONCLUSIONS. Among nursing homes participating in an AHRQ-funded collaborative, VA and non-VA nursing homes differed in their approach to CAUTI prevention. Best practices from both settings should be applied universally to create an optimal infection prevention program within emerging integrated healthcare systems.

In the United States, approximately 1.4 million people reside in more than 15,700 community-based nursing homes.1 The US Department of Veterans Affairs (VA) nursing homes, also referred to as Community Living Centers, serve nearly 50,000 Veterans each year. Nursing homes are crucial for meeting the post-acute and long-term care needs of older adults. With the burgeoning post-acute care population, many of these individuals are recovering from serious events and are at high risk of complications, including infections, leading to substantial morbidity and mortality.2,3 Urinary tract infection (UTI) is the most commonly reported infection, although this may be due in part to overtreatment and misclassification of asymptomatic bacteriuria as an infection.4


Received August 3, 2016; accepted October 22, 2016
© 2016 by The Society for Healthcare Epidemiology of America. All rights reserved. DOI: 10.1017/ice.2016.279
To reduce the incidence of infections, nursing homes must have individualized infection control programs.\textsuperscript{5,6} Furthermore, in 2013, the US Department of Health and Human Services approved a plan to enhance nursing home resident safety by reducing healthcare-associated infections (HAIs), with particular emphasis on reducing indwelling urinary catheter use and catheter-associated urinary tract infection (CAUTI).\textsuperscript{7} However, unlike infection preventionists working in acute care hospitals, infection preventionists in nursing homes commonly have responsibilities other than infection control, such as employee health or staff education, and many receive no formal training in infection prevention.\textsuperscript{8}

The Agency for Healthcare Research and Quality (AHRQ) Safety Program for Long-term Care: HAIs/CAUTI\textsuperscript{9} aims to reduce CAUTIs, to enhance frontline healthcare professional knowledge about infection prevention, and to improve the safety culture in nursing homes. This national collaborative builds on an AHRQ-funded national project in acute care hospitals (ie, the AHRQ Safety Program to Reduce Catheter-Associated UTI in Hospitals)\textsuperscript{10} by expanding to the long-term care setting.\textsuperscript{11} Both VA and non-VA nursing homes participated in the national collaborative. Participating nursing homes were asked to complete a needs assessment questionnaire designed to assess the general characteristics of the facility, as well as the structure and process of their infection prevention program, including strengths and gaps related to CAUTI prevention. We hypothesized that VA nursing homes would have a more robust infection prevention infrastructure and better CAUTI surveillance practices due to the centralized organizational structure of the VA healthcare system and the fact that many VA nursing homes are colocated with acute care medical centers.

METHODS

Study Design

Between January 2014 and June 2015, at the start of each cohort of nursing homes participating in the AHRQ Safety Program for Long-term Care: HAIs/CAUTI collaborative,\textsuperscript{9} a needs assessment questionnaire was sent by e-mail to the organizational leaders responsible for managing project activities among a group of nursing home facilities. The needs assessment questionnaire was made available to participating facilities (63 VA and 431 non-VA facilities) electronically by web link or by paper. Team leaders were asked to complete the online or hard-copy questionnaire within 1 month; reminders were included in weekly newsletters. The national project team developed weekly dashboards with which the organizational leaders could monitor questionnaire submissions. A cover letter providing assurance of confidentiality accompanied the questionnaire. The University of Michigan Institutional Review Board reviewed the study and determined that it did not meet the regulatory definition of research involving human subjects.

Questionnaire Content

The questionnaire included 30 items about the structure and process of infection prevention at the nursing home, with a specific focus on CAUTI prevention (see Supplementary Material).\textsuperscript{12,13} Facilities provided the following nursing home-specific information: ownership (VA vs non-VA), number of residents, number of subacute care beds, physical proximity to a VA hospital (VA nursing homes only), and the numbers of physicians, registered nurses, licensed practical nurses, and certified nursing aides per 100 beds. Data regarding the nursing home’s infection preventionists, including duration at current position, hours spent on infection prevention–related activities, and training were also collected. For VA nursing homes, questions were included on whether the infection preventionist’s area of responsibility was nursing home care only or if they had broader responsibilities as part of their affiliated medical center infection prevention program. Facilities were also asked about the following items: (1) presence of a committee at the nursing home that routinely reviews HAIs; (2) types of resident services delivered, including 24-hour onsite supervision by a registered nurse, access to laboratory services including blood draws and urine tests, radiology services on both weekends and weekdays, and care provided for residents with intravenous infusions, wounds, tracheostomies, ventilators, and indwelling urinary catheters; and (3) availability of subacute care and rehabilitation on site. Questions assessing the presence of CAUTI prevention policies were asked, including appropriate indications for catheter use and catheter insertion documentation. A series of 5-point Likert-scale questions on catheter utilization and management practices were used to determine how regularly various CAUTI prevention practices were implemented. Responses of 4 (often) or 5 (always) were defined as “regular use” of the respective prevention practice, and responses of 3 (sometimes), 2 (rarely), or 1 (never) were defined as “not regular use.” The CAUTI surveillance domain included questions on tracking changes in CAUTI rates over time, creating CAUTI rate reports, and sharing the reports with leadership and frontline personnel.

Statistical Methods

Descriptive statistics were generated to assess both general and infection prevention–related characteristics of respondent nursing homes. Facility and infection prevention program characteristics of VA and non-VA nursing homes were compared using a 2-sample \textit{t} test for continuous variables and Pearson’s \textit{χ}\textsuperscript{2} test for categorical variables. Multivariable logistic regression was used to examine the associations between facility ownership type (VA vs non-VA) and the presence of urinary catheter use policies, catheter management practices, and surveillance procedures. Models were adjusted for the number of residents in the facility, providing short-term subacute rehabilitation, presence of an HAI committee, infection prevention–specific training, and an infection preventionist
with 3 or more years of experience with infection prevention programs. All analyses were performed using Stata version 13.0 (StataCorp LP, College Station, TX).

RESULTS
Responding Facility Characteristics
Of 494 facilities from 41 states, representatives of 353 facilities completed the questionnaire (71% response rate), with a 75% response rate (n = 47 from 25 states) from VA nursing homes and a 71% response rate (n = 306 from 28 states) from non-VA nursing homes. Respondents included directors of nursing (n = 135), infection preventionists (n = 52), facility administrators (n = 41), assistant directors of nursing (n = 34), nurse managers (n = 17), staff development/education coordinators (n = 27), quality managers (n = 11), minimum data set (MDS) coordinators (n = 8), staff nurses (n = 6), advanced practice nurses/nurse practitioners (n = 5), and others (ie, medical directors, pharmacists, and those with multiple clinical roles; n = 17).

The mean number of subacute beds and facilities providing subacute services were lower in VA nursing homes than in non-VA nursing homes (Table 1). A total of 10 VA nursing homes reported that they provide care for residents with spinal cord injuries. VA nursing homes had higher physician-to-bed ratios than non-VA nursing homes (5.0 vs 3.2 per 100 beds; P = .003), as well as higher ratios of registered nurse staffing to beds (30.4 vs 13.6 per 100 beds; P < .001). A higher percentage of VA nursing homes also reported having 24-hour registered nurse supervision than non-VA nursing homes (96% vs 56%; P < .001). Moreover, 85% of VA nursing homes had an infection preventionist with ≥3 years of relevant experience, and 94% reported having a formal committee that reviewed HAIs. Among non-VA nursing homes 72% had an infection preventionist with ≥3 years of relevant experience, and 79% reported having a formal committee that reviewed HAIs (Table 2). VA nursing homes also reported more hours per week devoted to infection prevention–related activities (31 hours vs 12 hours; P < .001). Most VA nursing homes (77%) were physically connected to an acute care hospital, and most VA nursing home infection prevention programs were part of their affiliated VA acute care hospital program (98%). More than 80% of our respondents reported that their infection preventionist was also responsible for infection prevention in the attached acute-care VA hospital.

Indwelling Urinary Catheter Utilization Policies and Management Practices
The percentage of nursing homes with specific indwelling urinary catheter utilization policies is shown in Table 2. Overall, a lower percentage of VA nursing homes reported having policies concerning appropriate catheter use compared with 81% of non-VA nursing homes (P = .004). The percentage of VA nursing homes that reported a physician order was required to insert a urinary catheter (83% vs 94%, P = .06) was also lower than in non-VA nursing homes.

With respect to CAUTI prevention practices, a higher percentage of VA nursing homes compared to non-VA nursing homes regularly use bladder scanners to assess urinary retention (89% vs 26%; P < .001) and urinary catheter drainage systems with pre-connected, sealed catheter tubing junctions (81% vs 60%; P = .009) (Table 3). Most nursing homes in both groups reported considering alternatives to indwelling catheters when appropriate, inserting catheters using aseptic technique, and keeping urinary drainage bags below the level of the bladder.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All Nursing Homes (N = 353)</th>
<th>VA Nursing Homes (n = 47)</th>
<th>Non–VA Nursing Homes (n = 306)</th>
<th>P&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subacute beds (±SD)</td>
<td>55.8 (55.8)</td>
<td>23.3 (39.5)</td>
<td>60.8 (56.3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Current residents (±SD)</td>
<td>97.1 (61.1)</td>
<td>77.2 (46.5)</td>
<td>100.2 (62.5)</td>
<td>.02</td>
</tr>
<tr>
<td>Physicians/100 beds (±SD)</td>
<td>3.5 (3.8)</td>
<td>5.0 (4.2)</td>
<td>3.2 (3.7)</td>
<td>.003</td>
</tr>
<tr>
<td>Registered nurses/100 beds (±SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>15.1 (9.21)</td>
<td>30.4 (10.3)</td>
<td>13.6 (7.6)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Licensed practical nurses/100 beds (±SD)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19.4 (8.8)</td>
<td>26.3 (11.0)</td>
<td>18.5 (8.0)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Certified nursing assistants/100 beds (±SD)</td>
<td>50.4 (11.9)</td>
<td>49.4 (13.7)</td>
<td>50.6 (11.6)</td>
<td>.57</td>
</tr>
<tr>
<td>24-hour supervision by a registered nurse provided, n(%)</td>
<td>217 (61.5)</td>
<td>45 (95.7)</td>
<td>172 (56.2)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Access to laboratory services, blood draws, and x-rays</td>
<td>343 (97.2)</td>
<td>42 (89.4)</td>
<td>301 (98.4)</td>
<td>.001</td>
</tr>
<tr>
<td>7 d/wk, n(%)</td>
<td>323 (91.5)</td>
<td>37 (78.8)</td>
<td>286 (93.5)</td>
<td>.001</td>
</tr>
</tbody>
</table>

Note. VA, Veterans Affairs.

<sup>a</sup>Facilities reporting more than 50 registered or licensed practical nurses per 100 beds were excluded as outliers (n = 51).

<sup>b</sup>P values represent comparisons between VA and non-VA nursing homes using χ² test for categorical variables and t-test for continuous variables. P < .05 were considered statistically significant.
Nursing home has a policy regarding:

Hand hygiene adherence measured 297 (84.1) 45 (95.7) 252 (82.4) .07
Screening for asymptomatic bacteriuria performed 73 (20.7) 13 (27.7) 60 (19.6) .38

Nursing home committee reviews healthcare-associated infections, including CAUTI

Urinary catheter disconnected from collecting systems

Use of urinary drainage systems with pre-connected, sealed catheter tubing junction

Catheters changed at routine fixed intervals (eg, every 30 d)

Catheters removed within 24–48 h of admission unless there are appropriate indications for continued use

Alternatives to indwelling catheters used when appropriate

Portable bladder scanner used to assess urine volume

Use of urinary drainage systems with pre-connected, sealed catheter tubing junction

CAUTI Surveillance Activities

Of all responding nursing homes, 69% reported that they conducted CAUTI surveillance prior to joining the AHRQ Safety Program (Table 4). However, compared with non-VA nursing homes, the percentage of VA nursing homes conducting CAUTI surveillance was substantially higher (94% vs 66%; \( P < .001 \)). When evaluating specific CAUTI surveillance practices, more VA nursing homes reported keeping records of residents with CAUTI using an electronic spreadsheet, database, or logbook (85% vs 53%; \( P < .001 \)). Additionally, higher percentages of VA nursing homes were aware of their CAUTI rates, collected data using an electronic health record system, and used standardized definitions to define CAUTI prior to the program (Table 4). A significantly higher percentage of VA nursing homes than non-VA nursing homes also reported tracking CAUTI over time (92% vs 67%; \( P = .014 \)), creating CAUTI summary reports (89% vs 59%; \( P = .002 \)), and sharing the results with facility leadership (94% vs 70%; \( P = .014 \)), nursing personnel (85% vs 56%; \( P = .003 \)), and

<table>
<thead>
<tr>
<th>Program Characteristic</th>
<th>All Respondents ((N = 353)), No. (%)</th>
<th>VA Nursing Homes ((n = 47)), No. (%)</th>
<th>Non-VA Nursing Homes ((n = 306)), No. (%)</th>
<th>(P) Values*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead infection preventionist has (\geq 3) years of infection prevention experience</td>
<td>259 (73.4)</td>
<td>40 (85.1)</td>
<td>219 (71.6)</td>
<td>.05</td>
</tr>
<tr>
<td>Hours per week spent on infection prevention-related activities, mean (± SD)</td>
<td>14.4 (±12.6)</td>
<td>31.3 (±12.6)</td>
<td>11.8 (±10.3)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Nursing home committee reviews healthcare-associated infections, including CAUTI</td>
<td>285 (80.7)</td>
<td>44 (94.0)</td>
<td>241 (78.8)</td>
<td>.06</td>
</tr>
<tr>
<td>Nursing home has a policy regarding:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriate indications for catheter use</td>
<td>279 (79.0)</td>
<td>30 (63.8)</td>
<td>249 (81.4)</td>
<td>.004</td>
</tr>
<tr>
<td>Urinary catheter insertion</td>
<td>328 (92.9)</td>
<td>39 (83.0)</td>
<td>289 (94.4)</td>
<td>.004</td>
</tr>
<tr>
<td>Urinary catheter maintenance</td>
<td>321 (90.0)</td>
<td>37 (78.7)</td>
<td>284 (92.8)</td>
<td>.001</td>
</tr>
<tr>
<td>Requires a physician order for catheter placement with documentation of indication</td>
<td>325 (92.1)</td>
<td>39 (83.0)</td>
<td>286 (93.5)</td>
<td>.06</td>
</tr>
</tbody>
</table>

*\(P\) values in the final column represent significance value of the coefficient for the urinary catheter management strategy represented in each row that was estimated using multivariable logistic regression models adjusted for number of residents in facility, short-term subacute rehabilitation offered, presence of an HAI committee, infection prevention training, and infection preventionist with 3 or more years of experience. \(P < .05\) were considered statistically significant.

Table 3. Indwelling Urinary Catheter Management Strategies

<table>
<thead>
<tr>
<th>Urinary Catheter Management Strategy Used Regularly</th>
<th>All Nursing Homes ((N = 353)), No. (%)</th>
<th>VA Nursing Homes ((n = 47)), No. (%)</th>
<th>Non-VA Nursing Homes ((n = 306)), No. (%)</th>
<th>(P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary catheters removed within 24–48 h of admission unless there are appropriate indications for continued use</td>
<td>322 (91.2)</td>
<td>35 (74.5)</td>
<td>287 (93.8)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Alternatives to indwelling catheters used when appropriate</td>
<td>331 (97.8)</td>
<td>42 (89.4)</td>
<td>289 (94.4)</td>
<td>.27</td>
</tr>
<tr>
<td>Portable bladder scanner used to assess urine volume</td>
<td>121 (34.3)</td>
<td>42 (89.4)</td>
<td>79 (25.8)</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Use of urinary drainage systems with pre-connected, sealed catheter tubing junction</td>
<td>220 (62.3)</td>
<td>38 (80.9)</td>
<td>182 (59.5)</td>
<td>.009</td>
</tr>
<tr>
<td>Catheters changed at routine fixed intervals (eg, every 30 d)</td>
<td>242 (68.6)</td>
<td>27 (57.5)</td>
<td>215 (70.3)</td>
<td>.36</td>
</tr>
<tr>
<td>Urinary catheter disconnected from collecting systems (eg, for irrigations, leg bag attachments)</td>
<td>117 (33.1)</td>
<td>14 (29.8)</td>
<td>103 (33.7)</td>
<td>.94</td>
</tr>
<tr>
<td>Screening for asymptomatic bacteriuria performed</td>
<td>73 (20.7)</td>
<td>13 (27.7)</td>
<td>60 (19.6)</td>
<td>.38</td>
</tr>
<tr>
<td>Hand hygiene adherence measured</td>
<td>297 (84.1)</td>
<td>45 (95.7)</td>
<td>252 (82.4)</td>
<td>.07</td>
</tr>
</tbody>
</table>

*\(P\) values in the final column represent significance value of the coefficient for the urinary catheter management strategy represented in each row that was estimated using multivariable logistic regression models adjusted for number of residents in facility, short-term subacute rehabilitation offered, presence of an HAI committee, infection prevention training, and infection preventionist with 3 or more years of experience. \(P < .05\) were considered statistically significant.
physicians (81% vs 49%; \(P = .004\)). In addition, 77% of VA nursing homes report their CAUTI rates to the VA Inpatient Evaluation Center.

**DISCUSSION**

In this national cohort of federally funded VA nursing homes and community-based, non-VA nursing homes, we found key differences in their overall approaches to infection prevention, resources allocated to infection prevention, and CAUTI prevention practices. First, VA nursing homes have substantially higher ratios of physician and nurse staffing to beds than non-VA nursing homes. Second, most VA nursing home infection prevention programs are integrated within their respective VA acute care infection prevention programs and have more infection prevention–related resources. Third, while more non-VA nursing homes report having established catheter utilization policies, they were less likely to conduct CAUTI surveillance.

The VA healthcare system is the nation’s largest integrated healthcare delivery system and provides comprehensive healthcare services to veterans across the United States. Prior research studies have shown that care provided by the VA system exceeds that of other healthcare providers in several areas.\(^{16–21}\) Studies comparing VA and non-VA patients have, for example, shown better performance on measures of chronic disease and preventive care,\(^ {16} \) greater rates of evidence-based drug therapy,\(^ {17} \) and better outcomes for older men who are hospitalized for several cardiac conditions.\(^ {18} \)

Several studies have also shown that VA hospitals are leaders in the use of key practices to prevent catheter–related blood stream infections.\(^ {19–21} \) Consistent with these studies, we found better CAUTI surveillance practices within VA nursing homes.

Most VA nursing homes (94%) conduct CAUTI surveillance and report their CAUTI rates to the VA Inpatient Evaluation Center (77%), emulating VA acute care surveillance practices.\(^ {22} \)

Moreover, use of standardized surveillance definitions is more common among the VA nursing homes than the non-VA nursing homes. We believe that the centralized infrastructure of the VA, increased numbers and training of staff, and the use of national VA benchmarks and leadership engagement likely account for these findings.\(^ {22} \)

On the other hand, the non-VA nursing homes we surveyed report greater use of catheter utilization policies. Non-VA nursing homes were more likely than VA nursing homes to have a policy requiring documentation of appropriate indications for catheter use, appropriate catheter insertion and maintenance practices, as well as requiring a physician’s order to place a urinary catheter. A higher percentage of non-VA nursing homes also reported that urinary catheters are removed within 24–48 hours of admission than VA nursing homes. This is likely, in part, because non-VA nursing home certification as a Medicare and/or Medicaid nursing home provider includes adhering to established regulatory guidance from the Centers for Medicare and Medicaid Services (CMS) on the appropriate use of indwelling urinary catheters as well as public reporting of the prevalence of indwelling urinary catheters.\(^ {24–26} \) These regulations have enhanced several processes of care, including reducing the use of indwelling catheters (from 9% to 5%) in non-VA nursing homes.\(^ {27–29} \) In contrast, in a nationwide sample of all VA nursing homes, 11% of 10,939 residents had an indwelling urinary catheter.\(^ {30} \) This high urinary catheter utilization rate within VA nursing homes may be due to the predominantly older male population with greater prevalence of urinary outlet obstruction, a higher percentage of residents with spinal cord injuries, as well as a higher percentage of residents receiving end-of-life care.

Our findings have important implications for both policy and practice, as non-VA nursing homes become further integrated with acute care facilities under emerging Medicare Accountable Care Organization (ACO) programs.
ACO programs are expected to provide better coordination and a higher quality of care, which could translate to financial benefits through, for example, reduced readmissions. Infections remain a major cause of readmission to acute care hospitals. Including nursing homes within the ACOs has the potential to improve continuity of care, quality of care, resident satisfaction, fewer inappropriate transfers, and reductions in the spread of antimicrobial resistance and infections. Furthermore, to control spending pertaining to infections for care spanning acute, post-acute, and long-term care settings, infection prevention programs between hospitals and partnering nursing homes could be aligned. This alignment would foster adoption of best practices from both VA and non-VA nursing homes, including surveillance for common infections, reduced device utilization, joint antimicrobial stewardship programs, and training to reduce infection-related hospitalizations and enhance outcomes.

Our study has important limitations. First, this study was conducted within a collaborative setting with voluntary participation of interested nursing homes, leading to a self-selection bias. Furthermore, there is a potential for reporting bias because we did not conduct actual observations or in-depth interviews to confirm the questionnaire findings. Second, we do not have information concerning resident demographics, their diagnoses, or comorbidities. The collection of data regarding individual resident characteristics was beyond the scope of this project. Some differences in reported resources and practices may be related to a difference in the populations served. Third, participating facilities identified their own team leader, who was often a director or associate director of nursing, to coordinate program activities at the facility. Thus, while the facility team would likely include an infection preventionist, the survey respondent may or may not have been an infection preventionist. Finally, our findings suggest that future studies evaluating infection prevention personnel resources should be designed to further characterize time required in conducting hospital versus nursing home infection prevention activities.

Limitations notwithstanding, this study fills some important gaps in the literature. No studies have compared infection prevention programs of VA and non-VA nursing homes. In our study, we identified the potential benefits of integrated healthcare systems such as the VA in implementing surveillance practices and the role of regulatory agencies such as the CMS in reducing catheter utilization in community-based nursing homes. Best practices from both settings should be universally adopted and promoted to reduce infections, enhance use of evidence-based practices, and improve resident safety in the nursing home setting.

ACKNOWLEDGMENTS

Financial support: This work was supported by a contract from the Agency for Healthcare Research and Quality (AHRQ), US Department of Health and Human Services (contract no. HHSA 29020100025I). Other funding/support was provided by the following: the National Institutes of Health (grant no. R01 AG41780 and K24 AG05685 to Mody; grant no. NIH DK092293 to Trautner); the University of Michigan Claude D. Pepper Older Americans Independence Center (grant no. NIA P30 AG024824 to Mody); AHRQ (grant nos. K08-HS019767, P30HS024385, and R01HS018334 to Meddings); Department of Veterans Affairs (grant no. VA RRP 12–433 to Trautner); Center for Innovations in Quality, Effectiveness and Safety at the Michael E. DeBakey VA Medical Center, Houston, Texas (grant no. CIN13–413 to Trautner); VA National Center for Patient Safety Patient Safety Center of Inquiry (to Saint); and a VA Health Services Research and Development Research Career Scientist Award (grant no. RCS 11–222 to Krein).

Potential conflicts of interest. Dr. Saint has received fees for serving on advisory boards for Doximy and Jvion. Dr. Meddings has received honoraria for lectures and teaching related to prevention and value-based purchasing policies involving catheter-associated urinary tract infection and hospital-acquired pressure ulcers. She has also received honoraria from RAND Corporation/AHRQ for preparation of an AHRQ chapter update on the prevention of catheter-associated UTI. Dr. Trautner has received honoraria for speaking from Baylor Scott & White, Texas A&M Health Sciences Center. She has provided consultation for Zambon Pharmaceuticals and Lasergen. All other authors report no conflicts of interest.

Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Agency for Healthcare Research and Quality, the U.S. Department of Health and Human Services, or the Department of Veterans Affairs.

Address correspondence to Lona Mody, MD, MSc, University of Michigan Medical School, Division of Geriatric and Palliative Medicine, 300 N. Ingalls St, Room 905, Ann Arbor, MI 48109 (lonamody@umich.edu) or Sarah L. Krein, PhD, RN, Center for Clinical Management Research Ann Arbor Veterans Affairs Healthcare System, PO Box 130170, Ann Arbor, MI 48113 (skrein@umich.edu).

SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit https://doi.org/10.1017/ice.2016.279

REFERENCES


