CAUTI rates, no published studies have been conducted in the VA setting or have reported use of an exportable tool such as NLP.[5,6] The benefits of NLP include the ability to capture specific symptoms from unstructured notes to improve diagnostic accuracy, the ability to be combined with other data-mining methods, and the potential to be generalized to other measures and implemented at other facilities.[8,9] Our study is limited by being primarily descriptive and being performed for a small sample size and in one institution. The framework of structured documentation of Foley catheter presence is key to the performance of our measurement tool. However, advanced NLP tools have the advantage of not requiring structured notes and are now being employed at our facility to capture unstructured data, such as patient symptoms.

The most intriguing aspect of automated CAUTI measurement is the ability to enhance prevention efforts by increasing awareness of a catheter presence and of whether a valid reason exists for continued use (by the simple action of having a clinician document the Foley catheter presence every day into a note).[10] This allows for quick and automated feedback to end users and could stimulate improvement efforts. This study moves us one step closer to automated measurement of CAUTI by using a novel tool that harnesses the power of electronic records in the largest integrated healthcare system in the United States.[4]

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National Survey of Infection Preventionists: Policies for Discontinuation of Contact Precautions for Methicillin-Resistant *Staphylococcus aureus* and Vancomycin-Resistant Enterococcus

Methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant enterococcus (VRE) are endemic in hospital settings. The Centers for Disease Control and Prevention recommend placement of patients with a history of MRSA and/or VRE colonization on contact precautions (CP).[1,2] While placement in private rooms is preferred, cohorting is an acceptable, common scenario in semiprivate room facilities. Although MRSA and VRE colonization clear spontaneously, no national guidelines exist to inform when or how CP may be discontinued.[1,2] We conducted a nationwide survey to gain insight into institutional CP practice.

We electronically surveyed members of the Association for Professionals in Infection Control and Epidemiology (APIC; Partners Human Research Committee P2010-001336). Participants received a link to the web-based survey on July 5, 2011, which remained active for 1 month. Study data were

TABLE 1. Respondent Institutional Characteristics and Infection Control Policies

	No. (%)
Institution characteristics (N = 2,580)	
Location	
Rural/small town, population <20,000	679 (26.3)
Town, population 20,000–49,999	376 (14.6)
Urban, population ≥50,000	1,506 (58.4)
Licensed beds	
<400	1,991 (77.2)
≥400	584 (22.6)
Bed organization	
All single occupancy	734 (28.4)
All double occupancy	59 (2.3)
Mix of single and double occupancy	1,771 (68.6)
MRSA infection control policies	
Is there a policy that allows for discontinuation of CP for MRSA? (N = 2,580)	
Yes	1,873 (72.6)
No	640 (24.8)
Do you actively screen for the purposes of discontinuation of MRSA CP? (N = 2,580)	
Never	809 (31.4)
Sometimes	1,094 (42.4)
Always	629 (24.4)
Does your MRSA CP policy incorporate any of the following components? (N = 1,873)[a]	
Time since last positive culture before screening eligibility	460 (24.6)
Use of microbiological assays to confirm clearance	1,465 (78.2)
Permissiveness of concurrent or recent antibiotic use	616 (32.9)
Other/none of the above	377 (20.1)
Details of MRSA CP policies incorporating use of microbiological assays (N = 1,465)	
Time since last positive culture before screening eligibility, months (N = 460)	
<6	118 (25.7)
≥6	335 (72.8)
Body site(s) of screening (N = 1,465)	
Nares	420 (28.7)
Nares plus original site of infection	668 (45.6)
Other	367 (25.1)
No. of negative specimens required to confirm clearance (N = 1,465)	
1	466 (31.8)
2	444 (30.3)
3	503 (34.3)
>3	27 (1.8)
Time interval between specimen collection (N = 974)	
24 hours	333 (34.2)
48 hours	215 (22.1)
1 week	348 (35.7)
>1 week	55 (5.7)
VRE infection control policies	
Is there a policy that allows for discontinuation of CP for VRE? (N = 2,580)	
Yes	1,457 (56.5)
No	973 (37.7)
Do you actively screen for the purposes of discontinuation of VRE CP? (N = 2,580)	
Never	1,284 (49.8)
Sometimes	861 (33.4)
Always	327 (12.7)
Does your VRE CP policy incorporate any of the following components? (N = 1,457)[a]	
Time since last positive culture before screening eligibility	320 (22.0)
Use of microbiological assays to confirm clearance	1,122 (77.0)
Permissiveness of concurrent or recent antibiotic use	412 (28.3)
Other/none of the above	253 (17.4)

TABLE 1 (*Continued*)

	No. (%)
Details of VRE CP policies incorporating use of microbiological assays (N = 1,122)	
Time since last positive culture before screening eligibility, months (N = 320)	
<6	100 (31.3)
≥6	213 (66.6)
Body site(s) of screening (N = 1,122)	
Rectum	281 (25.0)
Original site of infection	201 (17.9)
Rectum plus original site of infection	628 (56.0)
No. of negative specimens required to confirm clearance (N = 1,122)	
1	212 (18.9)
2	180 (16.0)
3	691 (61.6)
>3	24 (2.1)
Time interval between specimen collection (N = 895)	
24 hours	132 (14.8)
48 hours	110 (12.3)
1 week	597 (66.7)
>1 week	41 (4.6)

NOTE. Respondents reporting "I don't know" or not responding to a particular question are not provided, and thus the summed percentages may not equal 100%. CP, contact precautions; MRSA, methicillin-resistant *Staphylococcus aureus*; VRE, vancomycin-resistant enterococcus.

[a] This question was asked in a "check all that apply" format, so summed percentages may exceed 100%.

collected and managed using Research Electronic Data Capture (REDCap).[3]

Survey questions covered facility and respondent characteristics, infection control policies, and CP discontinuation policies. Details of discontinuation policies included time since last positive culture prior to eligibility for CP discontinuation, use of microbiological assays to confirm clearance, and permissiveness of concurrent antimicrobial use. For policies requiring microbiological confirmation, respondents were queried regarding the screening site(s) and the timing and number of specimens collected. We analyzed variation in protocols by examining the frequency of respondents with shared protocol elements as a proportion of all reported policies.

Selected institutional characteristics and reported infection control policies are provided (Table 1). Of 11,368 APIC members e-mailed, 3,057 responded (26.9%), among whom 2,580 (84.4%) self-identified as working primarily in inpatient settings. Most reported a mix of private and semiprivate, or all semiprivate, accommodations (1,830/2,580; 70.9%); 1,544/1,830 (84.4%) reported cohorting MRSA or VRE patients (data not shown).

The majority of respondents reported institutional policies allowing for CP discontinuation in patients with a history of MRSA (1,873/2,580; 72.6%) or VRE (1,457/2,580; 56.5%). A minority of respondents reported a policy for actively screening patients for these purposes.

Of the 1,873 respondents reporting the existence of a MRSA CP discontinuation policy, 460 (24.6%) indicated that eligibility for screening depended on time since last positive MRSA culture. For policies where time was a consideration, 25.7% reported waiting times of <6 months, and 72.8% reported waiting ≥6 months prior to screening.

The majority of respondents (1,465/1,873; 78.2%) reported a policy that required microbiological confirmation of clearance of MRSA colonization. Analysis of MRSA CP discontinuation policies revealed that clearance was based on the timing and number of specimens collected, the specimen collection site, and the time elapsed since last positive culture. The combination of reported requirements yielded 64 distinct MRSA CP discontinuation strategies, only 2 of which accounted for >5% of respondents. These 2 policies both required >6 months to elapse prior to screening and used a single sample from either the nares or the nares in addition to the original infection site.

Of the 1,457 respondents reporting the existence of a VRE CP discontinuation policy, 320 (22.0%) indicated that the policy considered time since last positive VRE culture when determining CP discontinuation eligibility. For policies where time was a consideration, 31.3% reported waiting <6 months, while 66.6% reported waiting ≥6 months since most recent positive culture prior to screening.

The majority of respondents reported the existence of an institutional policy requiring microbiological confirmation of VRE clearance (1,122/1,457; 77.0%). Analysis of VRE CP discontinuation policies revealed that clearance was based on the timing and number of specimens collected, the collection site, and the time elapsed since last positive culture. The combination of reported requirements yielded 48 unique

strategies, with 4 strategies accounting for >5% of respondents each. A single strategy requiring 6 months since prior positive culture and 3 specimens obtained from both the rectum and the original infection site at 1-week intervals was reported by 17.2% of respondents.

This survey highlights the substantial variation in CP discontinuation policies that occurs in the absence of national guidance. Though most respondents indicated the existence of MRSA/VRE CP discontinuation policies at their institutions, the majority did not actively screen patients for CP discontinuation. In the absence of an active screening program, formerly colonized patients may inappropriately remain on CP indefinitely, even in institutions with discontinuation policies.

CP results in fewer patient-provider interactions, possibly leading to delays in care or reductions in the quality of care.[4] In settings that allow cohorting, patients who have cleared colonization (but who have not been tested and confirmed as such) may be falsely cohorted with others who have active infection or colonization, thus risking reacquisition.[5,6] From the hospital perspective, misclassification of CP patients wastes resources in the form of gowns and gloves, personnel time spent cleaning rooms and donning and doffing protective equipment, and reductions in bed availability and delays in bed assignment due to cohorting requirements.[7-9]

Due to the anonymous nature of the survey, we were unable to assess whether respondents to our survey differed from nonresponders. It is also possible that more than 1 response per institution was included. Although our response rate of 26.9% was less than optimal, this survey provides insights into the diverse set of institutional policies in the absence of national guidelines.

Given the paucity of data to inform evidence-based guidelines, further research on the most effective strategies for discontinuation of CP in MRSA/VRE patients is needed. Such research could inform national guidelines to address the growing pool of colonized and resource-intensive patients.

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