

## ORIGINAL ARTICLE

# A Multicenter Qualitative Study on Preventing Hospital-Acquired Urinary Tract Infection in US Hospitals

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**OBJECTIVE.** Although urinary tract infection (UTI) is the most common hospital-acquired infection, there is little information about why hospitals use or do not use a range of available preventive practices. We thus conducted a multicenter study to understand better how US hospitals approach the prevention of hospital-acquired UTI.

**METHODS.** This research is part of a larger study employing both quantitative and qualitative methods. The qualitative phase consisted of 38 semistructured phone interviews with key personnel at 14 purposefully sampled US hospitals and 39 in-person interviews at 5 of those 14 hospitals, to identify recurrent and unifying themes that characterize how hospitals have addressed hospital-acquired UTI.

**RESULTS.** Four recurrent themes emerged from our study data. First, although preventing hospital-acquired UTI was a low priority for most hospitals, there was substantial recognition of the value of early removal of a urinary catheter for patients. Second, those hospitals that made UTI prevention a high priority also focused on noninfectious complications and had committed advocates, or “champions,” who facilitated prevention activities. Third, hospital-specific pilot studies were important in deciding whether or not to use devices such as antimicrobial-impregnated catheters. Finally, external forces, such as public reporting, influenced UTI surveillance and infection prevention activities.

**CONCLUSIONS.** Clinicians and policy makers can use our findings to develop initiatives that, for example, use a champion to promote the removal of unnecessary urinary catheters or exploit external forces, such as public reporting, to enhance patient safety.

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Infections acquired during hospitalization are common, costly, and associated with significant morbidity.<sup>1,2</sup> Urinary tract infection (UTI) is the most common hospital-acquired infection, accounting for about 40% of all nosocomial infections.<sup>3,4</sup> Many hospital-acquired UTIs are caused by the use of a urinary catheter, a commonly used device among hospitalized patients.<sup>4,5</sup> Hospital-acquired UTIs can be prevented by using indwelling catheters only when necessary, implementing reminder systems to get catheters removed as soon as possible, using antimicrobial-impregnated catheters in high-risk patients, and considering alternatives to Foley catheterization (such as condom catheters for men).<sup>6-12</sup>

While numerous reviews have been published evaluating UTI preventive practices and recommending which methods to use,<sup>13-18</sup> the use of these practices varies considerably across the United States.<sup>19</sup> What accounts for this variation? We conducted a multicenter study that employed both quantitative and qualitative methods to answer this question. In the qualitative phase of the study, we identified recurrent and unifying themes that characterize how US hospitals have ad-

ressed hospital-acquired UTI. We used qualitative methods because they are oriented toward understanding, rather than measuring, phenomena. Because data collection is open-ended—research participants are free to express themselves in their own words—qualitative studies involve a process of discovery. Through detailed, in-depth analysis of the resulting data, we can find out what takes place in complex healthcare environments. Therefore, qualitative studies are appropriate for describing how hospitals have addressed hospital-acquired UTI.

## METHODS

### Study Design and Sample

As part of a larger 3-phase sequential study employing both quantitative and qualitative methods,<sup>20,21</sup> we first collected and analyzed quantitative data on a national sample of hospitals to report what hospitals are doing to prevent hospital-acquired infections, including UTI. Details of this study are explained elsewhere.<sup>19,21</sup> Briefly, the quantitative phase of the

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study entailed a survey sent to the leading infection control professionals (ICPs) at 719 hospitals across the United States in May 2005. Our national survey sample included a wide spectrum of hospitals, including all 119 Veterans Affairs (VA) medical centers with acute care beds in 2004 and a stratified random sample of non-VA general medical and surgical hospitals with 50 or more beds and with intensive care beds.

During the second and third phases of the study—the focus of the present article—we sought to understand why these hospitals were using or not using certain practices, by rigorously collecting and analyzing detailed qualitative data. In the second phase of the study, we conducted telephone interviews with key personnel from 14 US hospitals. To select these hospitals, we used “purposeful” sampling, the goal of which is to sample cases for in-depth analysis that can best help the investigator understand the central problem under study, rather than “representative” sampling, the goal of which is to generalize from study samples to populations.<sup>22</sup> Therefore, we intentionally included hospitals that, based on their responses to the phase 1 survey, used UTI preventive practices, so that we could learn something about the use of these practices, and contrasted such hospitals with the more typical hospitals that do not. Because we were also interested in looking at both large and small hospitals, we first stratified by size (hospitals with fewer than 250 beds vs hospitals with 251 hospital beds or more), then looked at the quantitative results from phase 1 of our study to determine the typical practices used in each stratum, and selected hospitals with both typical and nontypical use of the particular practices of interest in our study, including UTI. We also made sure that we included both VA and non-VA hospitals, and, of the VA hospitals, both those that were affiliated with an academic medical center and those that were not.

For the third and final phase of the study, we augmented the data collected from the phone interviews by visiting 5 of the 14 hospitals and conducting detailed in-person interviews with key personnel. We purposefully sampled these hospitals on the basis of their usefulness in elaborating themes that were emerging from our ongoing data analysis on the use of key infection preventive practices, including those to prevent UTI. Institutional review board approval was obtained from the VA Ann Arbor Healthcare System as well as from the local institutional review boards for each of the hospitals that we visited.

### Data Collection

We conducted 38 semistructured phone interviews with key personnel at 14 hospitals, 2-4 interviews at each hospital. Semistructured interviews produce rich data conveyed in the interviewee’s own words through the use of open-ended questions; the interviewer is able to tailor the interview to each respondent while still covering the specified domains.<sup>23</sup> Interviews were conducted between July 19, 2005 and May 12,

2006, lasted 29-92 minutes (mean, 60 minutes), and were audio recorded and transcribed verbatim by an experienced medical transcriptionist. At least 2 team members conducted each interview, and 6 of the 8 coauthors were interviewers. One of the interviewers compared a sample of the transcripts with the audio recordings to make sure that the transcripts reflected verbatim what was said by the interviewers and interviewees.

Conducting multiple interviews enabled us to understand perspectives from staff in different positions and helped us reach a more complete understanding of key themes. The first interview at each hospital was with an ICP. Thereafter, we used a “snowball” sampling technique, asking the ICP to recommend other potential respondents; this technique included asking about specific staff that the ICP mentioned as being integrally involved in adopting or implementing at least one of the key infection prevention practices that were the focus of the telephone interviews. We also interviewed staff that the ICP had not mentioned but whom we thought would provide valuable information.

We used an interview guide, developed with input from all team members, to ask interviewees which practices, if any, their organization used to prevent hospital-acquired UTI and to discuss, in detail, the process that led their organization to use those practices (Figure 1). We also asked interviewees to explain why they did not use certain practices. The interview also included general questions on relevant organizational characteristics. In the second phase of the study, all of the ICPs were asked each of the questions in Figure 1 for each practice of interest used to prevent UTI, catheter-related bloodstream infection, and ventilator-associated pneumonia (VAP). All of the subsequent interviewees were asked about those practices with which they had been involved, plus the general questions. For example, if the interviewee was a nurse manager who had championed the implementation of early removal of Foley catheters but was not involved with the adoption of antimicrobial-impregnated urinary catheters, we focused our questions on the former.

We conducted another 39 in-person interviews during visits to 5 hospitals between October 26, 2006 and July 13, 2007. We selected these hospitals to explore further the themes that were emerging from our ongoing data analysis. The goal of the hospital visits was to gather more data and to test our interpretations of, or further explore issues identified in, the phone interviews. To that end, we observed the hospitals firsthand and obtained perspectives from more staff, including senior executives, midlevel managers, and frontline clinicians. Interviews were tailored to each hospital and to each interviewee.

### Analytic Approach

Analysis was conducted using rigorous qualitative procedures, and included all of the phone and hospital visit interviews

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Can you please describe the process this hospital went through in deciding to adopt/not adopt this practice? (Asked for each practice of interest for all telephone interviewees in phase 2 of the study; asked of interviewees when relevant during the site visits (phase 3 of the study).)

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How did this hospital identify the need for the practice?

What kind of information did this hospital have on the practice?

Who were the important people who helped this hospital decide to use this practice?

What factors did decision-makers consider?

What problems did this hospital run into getting this practice adopted?

Is this hospital experiencing any implementation problems? If so, what?

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What are the major barriers that prevented your hospital from implementing practices for reducing healthcare-associated infections? What are the facilitators?

If I could fix one barrier here that makes it more difficult for your organization to implement key practices for preventing healthcare-associated infections, what would you have me fix?

If someone wants to adopt a new infection control practice what committees do they go through?

How does being part of a large health care system affect the adoption and implementation of infection control practices? What are the benefits? The barriers?

Who are the main people who need to be on board for change to occur?

Have collaboratives\* had a role in the adoption or implementation of infection control practices at this hospital?

How has nursing been involved in infection control?

What is your perception of how senior management is involved in the adoption and implementation of infection control practices?

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FIGURE 1. Main questions used in the semistructured audio-recorded interviews. \*A collaborative was defined as some type of joint effort to reduce healthcare infections, such as Keystone or the Pittsburgh Regional Health Initiative.

in phases 2 and 3 of the study.<sup>24,25</sup> We conducted data analysis concurrently with data collection. It is essential in qualitative studies that the research team members be engaged in the analysis process throughout the study so they can progressively focus ongoing data collection on emerging topics and on elaborating developing themes.<sup>22</sup> To that end, interviewers produced interview summaries after each interview, and the team met monthly to identify and discuss emerging themes. In addition, to examine the data systematically, we developed a qualitative codebook. An initial set of codes was established on the basis of our study's conceptual model, and these codes were then refined and supplemented with categories derived from the interview transcripts. This process was carried out by having 4 members of the research team independently code 2 transcripts and then meet to discuss the codes. We met several times to reach consensus on code definitions, which were then documented in our qualitative codebook. As is the case with quantitative studies, it is important to

ensure the validity of findings, one aspect of which involves the process by which data are coded during the analysis. Because of the complex and dense nature of our data and our use of interpretive codes, we chose a consensus approach to coding. Specifically, instead of team members separately coding a subset of transcripts and reporting the percent of the codes on which they agreed, we used a consensus process to code all of the transcripts, with 2 coders coding each transcript independently, then meeting and coming to consensus on all discrepancies.<sup>26</sup> The interview transcripts, along with their coding, were then entered into NVivo software (QSR International) to facilitate the analysis.<sup>27</sup> The study NVivo database was extremely rich, including more than 533 pages of text.

For this study, extensive code summary reports related to the prevention of UTI were generated for each hospital using all transcripts from phases 2 and 3 of the study. The summaries were then reviewed independently by 3 members of

the study team; emerging themes were identified by each member. The team then met to question, discuss, and document interpretations and findings.

## RESULTS

Characteristics of the 14 US hospitals included in the study are summarized in Table 1. We interviewed staff members from various departments with a wide range of roles in the hospital, as listed in Table 2. Figure 2 lists the 4 themes that describe how the diverse sample of hospitals in our study addressed hospital-acquired UTI. Each theme is discussed in more detail below, with illustrative quotations.

### Theme 1: Preventing Catheter-Related UTI Was a Low Priority, Although There Was Substantial Recognition of the Value of Early Catheter Removal

Preventing catheter-related UTI was a low priority for many hospitals, compared with, for example, preventing catheter-related bloodstream infection and VAP. One ICP summarized the prevailing view among our respondents: "I would say there's a general perception in the field that urinary tract infections don't cause a lot of morbidity and mortality compared to the quote, sexy topic such as blood stream infection or surgical site infection or VAP." Another indication of low priority is that almost none of the hospital staff we interviewed conducted hospital-wide UTI surveillance. An ICP at a large VA hospital stated: "We don't even track them [UTIs] except in the nursing home and in the ICUs [intensive care units]."

Given that hospital-acquired UTI is deemed a low priority at several hospitals, some urinary catheters may be inserted without clear indications and may remain in place for convenience rather than medical necessity. We were told by a nurse during one of our hospital visits: "[O]ur other barrier is the Emergency Department, and this is where most of them [Foley catheters] are being placed.... I do feel that doctors forget to look under the sheets to say, 'Oh yeah, there's a Foley there,' and they just forget about it. And the nurses aren't going to take the initiative...."

At some hospitals, the catheters were not removed from patients because it was more convenient for the nurses to leave them in. One nurse stated that "convenience, unfortunately, is a high priority, and that is another factor, and especially with urinary catheters, yes, the workload will be increased if you have to take them to the bathroom or you have to change their bed a little more often...." Another nurse noted that "nurses innocently come up to me and say, 'I have a Foley in this patient because he's incontinent, and I know that's better for the patient,' and we know...that the Foley can act as a 1-point restraint, and actually it's worse for the patient because not much turning is being done.... This is one of our toughest areas...the incontinent patient and nursing staff...." A hospital epidemiologist agreed: "Let's say someone has a Foley in, you know he is incontinent, and the

nurse is not interested in removing it because it's going to be more work. She's going to try everything not to remove that Foley."

Several respondents, while admitting that hospital-acquired UTI was a low priority, acknowledged the importance of removing urinary catheters from patients as soon as possible. A hospital epidemiologist at an academically affiliated public hospital said: "[Neither I nor] anyone else has really been able to get ourselves that excited about trying to prevent bladder colonization. But...I think that we probably should try to be more proactive about getting the catheters out." One ICP said that removing catheters from patients in a timely fashion was "Medicine 101," even though her hospital had no systematic procedures for tracking or timely removal.

In summary, although the importance of preventing catheter-related UTI was minimized by our respondents, there was general agreement that catheters should be removed as soon as possible, because of the impact on patient discomfort, mobility, and length of stay. Although we heard from some nurses about their resistance to catheter removal, this attitude was not universal and could be overcome if there were more committed leadership by nurses, as discussed below.

### Theme 2: Hospitals That Made UTI Prevention a High Priority Also Focused on Noninfectious Complications and Had Committed Champions

Hospitals that were able to focus attention on hospital-acquired UTI often did so by also highlighting consequences

TABLE 1. Characteristics of the 14 US Hospitals Included in the Study

Characteristic	No. of phone interviews	No. of hospital visits
Location		
Northeast	2	0
Midwest	5	3
South	3	0
West	4	2
Veterans Affairs hospital		
Yes	7	2
No	7	3
Bed capacity		
<50	1	0
50-250	5	1
≥251	8	4
Urban hospital		
Yes	13	5
No	1	0
Academic affiliation		
Yes	12	5
No	2	0
Participated in a collaborative		
Yes	5	3
No	9	2

NOTE. For definition of collaborative, see Figure 1.

TABLE 2. Characteristics of Hospital Staff Interviewed to Identify Approaches to Prevention of Hospital-Acquired Urinary Tract Infection

Job title of hospital staff	No. of phone interviews (N = 38)	No. of in-person interviews (N = 39)
Infection control professional	15	5
Physician hospital epidemiologist or chief of infectious diseases	5	5
ICU nurse manager	5	3
ICU chief or other critical care physician	2	6
Chair or vice chair of medicine	2	5
Intravenous nurse clinician	2	1
Clinical nurse specialist	2	0
Quality manager or medical director	1	5
Chief of staff	0	4
Chief nurse or nurse executive	0	2
Project coordinator or manager	0	2
Other <sup>a</sup>	4	1
Total no. of physicians	9	22

NOTE. ICU, intensive care unit.

<sup>a</sup> Including chief executive officer, respiratory therapy supervisor, risk manager, emergency department nurse, and medical ICU nurse practitioner.

other than UTI. For example, one hospital addressed the issue of the nursing staff's resistance to timely catheter removal by focusing on preserving a patient's mobility. A physician administrator from this large private hospital explained, "the nurses on the geriatrics unit wanted to have their patients regain mobility or maintain their mobility at all costs, and having a catheter...was one other reason why they never had to get out of bed."

One hospital used an economic argument to encourage early removal of urinary catheters: "[I]f you want to remove the Foley catheter and you want to check whether they void or not, it's going to take about 6 hours.... So, theoretically, if you want to do a discharge, then you're losing 0.25 days...let's say you decrease the length of stay by 0.25 days and...there are about 35,000 admissions a year...if you just multiply...the lowest would be like 600 bed-days...you're not going to save money with just...decreasing UTI, you're going to save money with decreasing other issues [like] mechanical problems...late discharge...."

Hospitals that were actively engaged in hospital-acquired UTI prevention had a committed "champion." We use this term to mean an advocate who takes ownership of the problem (hospital-acquired UTI, in this case) and is willing to use his or her position to get a practice implemented by rallying others to help solve the problem.<sup>28</sup> These individuals tend to be respected by others at the hospital and are persuasive.

Having a champion who is highly placed in the organization, in addition to a respected unit-level champion (such as a nurse manager), facilitated the timely removal of catheters from patients. For example, a large private hospital had a hospital epidemiologist physician who was passionate about

preventing UTI and aggressive in developing innovative ideas to do so, including spearheading a nurse-initiated "removal of Foley catheters" project. The goals of the project were to educate nurses to be more aware of which patients had Foley catheters and also to let the nurses know that UTI rates can be reduced by decreasing the use of Foley catheters. The physician champion gained the support of nurse managers, who then became the unit-level champions.

During our hospital visits, we saw firsthand the strong influence of the unit-level nurse manager champions. The lead ICP, the hospital epidemiologist, and the project coord-

1. Preventing hospital-acquired catheter-related UTI infection was a low priority for most hospitals; however, there is substantial recognition of the value of early urinary catheter removal.
2. Those hospitals that made UTI prevention a high priority also focused on noninfectious complications and had committed, often nonphysician, champions who facilitated prevention activities.
3. Hospital-specific pilot studies were important in deciding whether or not to use novel devices such as antimicrobial-impregnated catheters.
4. External forces, such as directives and public reporting, influenced UTI surveillance and prevention activities.

FIGURE 2. The 4 major unifying and recurrent themes that characterize how the hospitals in the study have addressed hospital-acquired urinary tract infection (UTI).

dinator, who was a nurse, all agreed that success in implementing nurse-initiated catheter removal in a unit was linked directly to the strength of the individual nurse manager. During one of our hospital visits, we visited 2 units, one successful and one less so. We were told by other staff members at that particular hospital that the nurse manager of the successful unit was admired by her colleagues—both nurses and physicians—because of her devotion to excellent patient care. We observed how passionate she was about removing urinary catheters, insisting that staff on her unit be actively engaged in this initiative. As the project nurse coordinator explained: “[Y]ou see how powerful she is, and she will not take ‘no’ for an answer as far as getting that Foley out.... Can we [those of us not on that unit] have that power? Not always, no.”

Indeed, for the other unit in that same hospital, the timely catheter removal initiative was far less successful. As the nurse coordinator noted, perhaps the initiative was not as successful in this unit because the nurse manager was too deferential to the nurses. Each time a nurse came up with an excuse as to why the patient needed a catheter (eg, urinary incontinence), the nurse manager would give in. The nurse coordinator said, “I’m working on a floor right now where the...nurse manager is not very dynamic...she doesn’t continuously ask if there’s a Foley...it doesn’t seem like she supports what we’re doing right now, so I’m not so sure that their Foley rate will decrease.... I think it’s just the personality....” The ICP confirmed that the removal rate of catheters in that unit was lower.

Although a committed and passionate champion in some situations may be sufficient, hospitals can also provide tools to assist the champion, such as team-based financial incentives. At VA medical centers, for example, employees can receive a monetary reward for participating in a successful “goal sharing team.” Such teams appeared to galvanize the attention of the key personnel who could move an initiative (such as the use of urinary catheter reminders) forward. An ICP from a large VA explained: “[In] long-term care, they kind of became a champion of this. We do performance improvement and...our administration here has a thing that’s called...goal sharing and...people get money if they come up with ideas that they think can either benefit patients or save money.... The nurses in long-term care decided to try to get the Foleys out...and part of their goal sharing teams, they tried to decrease their UTI rate...there’s going to be 6 people on each team, and each get \$600, and it’s a sad thing to say that we do it for money, but the nurses became interested....” An ICP from an academically-affiliated VA explained, “But the one thing that’s really been amazing is these goal sharing teams. We did establish a goal sharing team to reduce our Foley catheter—days in our medical intensive care unit.... [With] this goal sharing team we’ve put together...we’ve reduced our Foley catheter—days below the top 10% of the best hospitals...the bottom line is we increased it through awareness and brainstorming with the nurses...what can we do to

get these catheters out? Everybody on that team will get a bonus.”

Thus, champions are important facilitators of change. The champions in our study were committed, passionate, and respected clinicians who employed various techniques, including financial incentives, to implement practices intended to reduce hospital-acquired UTI.

### Theme 3: Hospital-Specific Pilot Studies Often Influenced the Use of Antimicrobial-Impregnated Catheters

Several hospitals use antimicrobial-impregnated urinary catheters to prevent UTI, and rather than relying solely on reports in the literature to decide whether to use such catheters, these hospitals also rely on hospital-specific pilot studies. This finding may reflect doubt about whether published study results would apply to patients at a particular hospital, along with concerns about the higher cost of antimicrobial-impregnated catheters, compared with nonimpregnated catheters. Pilot evaluations done at hospitals in our study used before-and-after designs in one or more units. In general, if a pilot study generated a substantial decrease in UTI associated with the use of antimicrobial-impregnated catheters, then they were adopted and used broadly in the hospital. When asked why their hospital decided to use an antimicrobial-impregnated urinary catheter, an ICP at a VA hospital noted: “We actually did a study with them and saw a 45% reduction in urinary tract infections....” An ICP at a non-VA hospital explained, “[in]...the first year [of using an antimicrobial-impregnated urinary catheter]...we actually made a 47% decline in infection rates, and we [at first] didn’t believe it. We did [the surveillance] ourselves...we’re in the process of writing an article about it because we’ve had such success...3 years later [we] are going, “Yay! It’s because of the catheter—it really is.”

However, even some hospitals that undertook a pilot evaluation and did not find differences in UTI ended up using antimicrobial-impregnated catheters if the manufacturer offered a price discount. The leading ICP from a large VA hospital explained, “we did that clinical trial...we had actually more infections in our [antimicrobial-impregnated catheter] group than we did our control group. We have recently changed to the [antimicrobial-impregnated] catheter... because...[the manufacturer] has given us the same price [as the nonimpregnated catheter]...we are using the [antimicrobial-impregnated] catheter because we’re not paying the extra \$5 for it.” The leading ICP at a large private hospital described a similar scenario: “One of the manufacturers of urinary catheters...had offered for actually several years to come in and do a sort of a crude evaluation...of the efficacy of these catheters...so we had a total of 6 months postimplementation of the [antimicrobial-impregnated] catheter and found our rate had not changed at all in terms of the overall frequency.... At the conclusion of that, the manufacturer basically...[is] providing us with the [antimicrobial-impregnated] catheter

at the same price as the standard urinary catheter.... [Our administration] would not support an adoption of that technology without the pricing advantage that the company is giving us...so if that ever gets withdrawn, we will immediately drop back to the standard urinary catheter.”

In summary, rather than basing decisions exclusively on published reports, several hospitals wanted to see proof that antimicrobial-impregnated urinary catheters would work with their own patients. Pilot testing these catheters is intuitively appealing, but these kinds of pilot studies typically have low internal validity, because they are usually nonrandomized and often lack a control group. Furthermore, some hospitals used the new catheters because the manufacturer offered a discount—even when their pilot failed to show that these catheters lowered infection rates in their own patients.

#### **Theme 4: External Forces Influence the Decision of Whether to Adopt UTI Preventive Practices and Surveillance Activities**

It was clear that external forces could influence decisions about which practices hospitals would use. First, public reporting motivated some hospitals to initiate surveillance for UTI. One ICP explained that, although the surveillance process was sometimes frustrating and increased their workload, the threat of public reporting got personnel to pay attention to, and initiate surveillance for, UTIs. They discovered they had more UTIs than they thought: “[W]e’re basically doing total health surveillance now, and so we did get somebody who’s part of quality management department who’s looking at all urinary tract infections.... And basically it’s part of the whole initiative nationally to make public, infection rates. The only way it’s improved things is because...the threat of our rates being published to the public, I think, made people pay attention...we wanted to make sure that our numbers looked good and that our patients basically were safe.”

Second, in addition to the price discounts described above, the marketing and sales representatives of manufacturers would try to sway the purchasing decisions of hospitals by using aggressive marketing tactics, such as offering to pay for the catheter while the hospital conducted a trial. One ICP said, “[the manufacturer] tried to push its way through our door, and I got pulled in by purchasing to say ‘Okay, should we buy it [the antimicrobial-impregnated catheter]?’...I said, ‘I don’t know enough about it’...so...it was a very short little study we did...and basically we didn’t really reduce our UTI rate, and I said, ‘No, I will not recommend that catheter.’” Another ICP explained, “You know, [the manufacturer] was really twisting our arm to buy the [antimicrobial-impregnated] catheter.” An ICP from a different hospital noted: “A [manufacturer’s] representative...introduced me to some literature but also said, ‘You know, this is being used by other hospitals in town. We don’t understand why you’re not using it. It costs \$4.50 more than a regular catheter...and if you actually want to trial it, we will pay for the product and you

can trial it.’” As a result, the hospital did test the product and ended up using the antimicrobial-impregnated catheter.

In summary, external forces can influence a hospital’s decision to adopt hospital-acquired UTI prevention practices. Public reporting of infection rates may place higher priority on doing UTI surveillance. Finally, a manufacturer’s sales representative can also influence the purchasing decisions of a hospital.

#### **DISCUSSION**

Our extensive qualitative study included 38 semistructured phone interviews with key personnel at 14 purposefully sampled US hospitals and 39 in-person interviews at 5 of those 14 hospitals, to identify recurrent and unifying themes that characterize how hospitals have addressed hospital-acquired UTI. We hope our findings will help clinicians and policy makers design approaches to reduce hospital-acquired UTI. Even though preventing hospital-acquired UTI was a low priority for many hospitals, our results suggest several strategies that can be used to promote the use of important UTI prevention practices. First, highlighting noninfectious complications of urinary catheter use—for example, delayed discharge and lack of patient mobility—can facilitate the implementation of practices that ensure the timely removal of urinary catheters from patients. Second, identifying and supporting 1 or 2 dedicated champions, one of whom may be a nurse manager, is a key element in effectively implementing some UTI prevention practices. Indeed, the importance of nonphysician champions became apparent in most of the hospitals we evaluated. The use of team-based monetary incentives, especially in conjunction with a clearly recognized champion, can also result in the successful implementation of hospital-acquired UTI prevention practices.

We used qualitative research methods to identify the key factors in a hospital’s decision to use various practices to prevent hospital-acquired UTI. Although qualitative studies remain fairly uncommon in medical research, these studies are necessary to better understand the various factors affecting a hospital’s approach to preventing hospital-acquired infection. We believe that our approach—one that employed both quantitative and qualitative methods—allowed us to assess the reasons for using or not using various practices to prevent hospital-acquired UTI.<sup>21</sup>

Medicare’s recent decision to decline reimbursement for the extra cost of treating preventable complications during hospitalization<sup>29</sup>—including some nosocomial infections—will likely spur efforts by hospitals to reduce the incidence of hospital-acquired UTI. Given this new incentive to prevent infection, the practical implications of our research are 3-fold. First, patient-safety advocates and infection control personnel should highlight the noninfectious complications of hospital-acquired UTI, to gain support for preventive practices. Second, the early removal of urinary catheters has gen-

eral support and should perhaps be the initial focus of preventive practices aimed at reducing hospital-acquired UTI. Finally, local champions and other decision makers should be mindful of the important role that various factors—such as financial incentives and sales representatives—play in the prevention of hospital-acquired UTI.

Our findings should be interpreted in the context of the following limitations. We conducted a qualitative study to understand why hospitals are doing what they are doing. Accordingly, our goal was not to generalize findings from a study sample to a population or to provide precise estimates of effect size and statistical significance, as is common with quantitative evaluation. Although our sample is relatively large for a qualitative evaluation, it would be inappropriate to generalize these findings to the approximately 6,000 hospitals in the United States. Our intent was to provide information that could not be produced through a quantitative study, thereby offering decision makers and clinicians with avenues for further exploration. One of the ways in which qualitative findings are judged to be generalizable, or applicable, outside the study sample is if the reader recognizes the phenomenon described and finds it useful for understanding or changing a certain practice.<sup>22</sup> Findings from a qualitative study can therefore be thought of as “lessons for other settings” or “working hypotheses.”<sup>22</sup> Our findings provide a starting point for local discussion of hospital-specific barriers and facilitators.

We chose to study 14 US hospitals in detail—5 of which we evaluated in greater depth by visiting them in person—rather than collect and analyze data on more hospitals, because it is resource intensive to perform data collection and analysis sufficiently detailed and rigorous to produce valid and useful findings. The value of qualitative analysis depends in part on our ability to interpret and understand, as much as resources allow, the findings in each instance.

Limitations notwithstanding, our multicenter qualitative study revealed several important themes underlying how the hospitals we evaluated approached hospital-acquired UTI prevention. Clinicians, policy makers, payers, and quality improvement personnel can use our findings to structure initiatives that will, for example, use dedicated clinicians to champion the removal of unnecessary urinary catheters or exploit external forces to increase the priority of tracking infections and then implementing practices that will reduce them.

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