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Perspectives of hospital leaders and staff on patient education for the prevention of healthcare-associated infections

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Abstract

Objective: Device-related healthcare-associated infections (HAIs), such as catheter-associated urinary tract infections (CAUTIs) and central line-associated bloodstream infections (CLABSIs), are largely preventable. However, there is little evidence of standardized approaches to educate patients about how they can help prevent these infections. This study aimed to examine the perspectives of hospital leaders and staff about patient education for CAUTI and CLABSI prevention, as well as understand the challenges to patient education and the opportunities for its improvement.

Methods: A total of 471 interviews were conducted with key informants across 18 hospitals. Interviews were analyzed deductively and inductively to identify themes around the topic of patient education for infection prevention.

Results: Participants identified patient education topics specific to CAUTI and CLABSI prevention, including the risks of indwelling urinary catheters and central lines, the necessity of hand hygiene, the importance of maintenance care, and the support to speak up. Challenges, such as lack of standardized education, and opportunities, such as involvement of patient and family advisory groups, were also identified regarding patient education for CAUTI and CLABSI prevention.

Conclusions: Hospital leaders and staff identified patient education topics, and ways to deliver this information, that were important in the prevention of CAUTIs and CLABSIs. By identifying both challenges and opportunities related to patient education, our results provide guidance on

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CONFLICTS OF INTEREST

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how patient education for infection prevention can be further improved. Future work should evaluate the implementation of standardized approaches to patient education to better understand the potential impact of these strategies on the reduction of HAIs.

INTRODUCTION

Two of the most prevalent and costly healthcare-associated infections (HAIs) are catheter-associated urinary tract infections (CAUTIs) and central line-associated bloodstream infections (CLABSIs).^{1,2} When indwelling urinary catheters (i.e., Foley catheters) and central line devices are correctly inserted, properly maintained, and promptly removed, CAUTIs and CLABSIs can be largely avoided.^{3,4} Although healthcare providers are largely viewed as the ones responsible for preventing HAIs, the role of patients in infection prevention has also been recognized.⁵⁻⁷ Empowering patients to participate in patient safety initiatives requires that patients are educated about the risks to their safety and the actions they can take to mitigate those risks.⁸

Patient education resources for the prevention of CAUTIs and CLABSIs are available from the Society for Healthcare Epidemiology of America⁹⁻¹¹ as well as the Centers for Disease Control and Prevention.^{12,13} However, the need to improve patient education related to the prevention of CAUTIs and CLABSIs is highlighted by studies that have revealed that many patients are unaware of the risks of infections associated with indwelling urinary catheters and central lines.^{14,15} Furthermore, there is little current evidence of standardized efforts to educate patients about CAUTIs and CLABSIs, and there is a lack of information from the perspective of hospital leaders and staff about how this education is delivered, what challenges are encountered when delivering patient education, and what opportunities exist for improving patient education. This study sought to understand the perspectives of hospital leaders and staff about how patient education is currently utilized to engage patients in the prevention of CAUTIs and CLABSIs, in order to inform the development and implementation of patient education to help prevent these HAIs.

METHODS

Study Design

We visited 18 US hospitals from September 2017 to November 2019 as a part of a study exploring the role of management practices in the prevention of CAUTIs and CLABSIs.¹⁶ Hospitals were selected using a purposive sampling approach that aimed to recruit hospitals with a variety of organizational characteristics (Table 1).

Data Collection

A total of 471 key informants were interviewed across all hospitals (Table 1). Key informants included administrative leaders (e.g., C-suite leaders, n=51), clinical leaders (e.g., clinical directors and managers, n=137), infection prevention and quality (e.g., infection preventionists, directors and managers of quality improvement) (n=102), and frontline staff (e.g., nurses and physicians, n=181). Key informants at each hospital were identified by a site contact that helped ensure that all key informant roles were represented.

We used a semi-structured interview guide to ask key informants about their perspectives on management practices to prevent CAUTIs and CLABSIs. This interview guide included questions about systematic education surrounding infection prevention practices (see Appendix for interview guide). The majority of interviews were conducted in-person one-on-one or in small groups and lasted an average of 28 minutes. Interviews were audio-recorded, transcribed, and de-identified for analysis. The Ohio State University's IRB approved this study, and all key informants provided verbal informed consent.

Data Analysis

A deductive-dominant thematic analysis was used to categorize themes within the interview transcripts.^{17–19} Three members of the research team used a preliminary coding dictionary to code a small sample of interviews.²⁰ The preliminary coding dictionary was iteratively revised to accommodate emergent codes and evolving code definitions and a finalized coding dictionary was then applied to all interview transcripts. Systematic education was one theme identified in the transcripts through our deductive analysis. Through inductive analysis involving the constant comparative method,^{21,22} we categorized key informants' perspectives on patient education. ATLAS.ti qualitative analysis software (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany) was used to support this analysis.

RESULTS

Analysis of interview transcripts revealed several topics around patient education for the prevention of CAUTIs and CLABSIs: 1) types of resources used for patient education; 2) methods of educating patients; 3) content of patient education; 4) challenges to patient education; and 5) opportunities to improve patient education.

Patient education resources for prevention of CAUTIs and CLABSIs

Interviewees identified a number of resources for providing patient education about infection prevention (Table 2). These included offering paper resources, such as booklets, packets, and handouts; posted resources, such as signs and posters; and electronic resources, such as the electronic medical record (EMR), patient portals, or the internet.

Patient education methods for prevention of CAUTIs and CLABSIs

Interviewees also identified a number of methods by which patient education regarding infection prevention was delivered including at the point of care (e.g., during patient care tasks), during clinician rounding, at admission, or at discharge (Table 3).

Patient education content for prevention of CAUTIs and CLABSIs

Interviewees discussed four types of patient education topics that were focused on the prevention of CAUTIs and CLABSIs: 1) risks of indwelling urinary catheters and central lines; 2) necessity of hand hygiene; 2) importance of maintenance care for indwelling urinary catheters and central lines; and 4) support to speak up (Table 4).

First, interviewees recognized the importance of communicating to patients the risk of infection associated with indwelling urinary catheters or central lines. This education could occur at the time the device was inserted, or could be reiterated once a patient had a device in place. Interviewees noted the need to educate patients about the importance of removing the device to lower the patient's chance of infection. This was particularly important, as having an indwelling urinary catheter or central line could be perceived by the patient to be a convenience. As one interviewee noted, *"One of the biggest things I can see about the Foley, it'll be get the Foley out. You're trying to educate the patient because, you know, some people will say, 'Oh, you know the Foley can come out.' 'Oh, leave it in, it's easier.' So, we do education—there are the risks for infection, and things like that."* (frontline staff)

Second, interviewees mentioned patient education about hand hygiene and its role in preventing CLABSIs and CAUTIs. Interviewees mentioned educating patients specifically to wash their hands in relation to touching their devices. As one interviewee described, patients would be given the message, *"...you have a central line, this is what you should expect. Everybody washes their hands. You wash your hands. You don't touch it. Same thing with a catheter and, you know, appropriate hygiene care for yourself while you have it."* (clinical leader)

Interviewees also recognized the need to educate patients about the importance of the maintenance care they would receive for their devices to help prevent infections. Education surrounding care of central lines was perceived as particularly important as some patients would try to decline this care. One interviewee gave an example: *"...what we were finding was that the patients were just declining their chlorhexidine [gluconate] baths because, you know, they don't like it. It's sticky, ... 'No thanks, I do not need that today.'" (administrative leader)*

Supporting patients and encouraging them to speak up when they saw something of concern was another topic of education that interviewees noted. First, interviewees stressed education to support patients speaking up when care providers did not perform proper hand hygiene. Patients were also educated to speak up about the maintenance of their devices. As one interviewee described, *"When we're rounding on the various bundles, I know that we talk to the patients and let them know what they should be seeing. When someone touches your central line, they should be scrubbing that hub before... we even have little signs hanging in the rooms with a little rubber ducky saying, 'Scrub the hub.' ... We talk openly with them about what they should expect to see, and they're free to call it out if they don't see it to protect themselves."* (frontline manager) Lastly, some interviewees discussed encouraging patients to speak up about the removal of their devices, with one interviewee giving the example, *"...ask every day. Tell the patient [to] ask, 'Do I have to have it?'" (clinical leader)*

Challenges to patient education for prevention of CAUTIs and CLABSIs

When discussing patient education for the prevention of CAUTIs and CLABSIs, interviewees emphasized two challenges: 1) lack of patient education targeted toward CAUTI and CLABSI prevention, and 2) non-standardized patient education. With respect to a lack of targeted education, some interviewees noted they were not aware of any patient education for infection prevention; others were aware of general infection prevention

education, but not of education specific to the prevention of CAUTIs or CLABSIs. With respect to a lack of standardized patient education, one interviewee explained: *“...there is no such thing as a patient with a central line or a Foley, if we are about to place those devices, that we re-educated in a standardized way.”* (clinical leader) Inconsistency across units in the hospital was also noted as a challenge to delivering standardized education to the patient. One interviewee discussed this challenge with regard to creating patient awareness about the need for their central line hub to be scrubbed for the recommended 15 seconds: *“1-2-3 count with me, which is a scrub the hub thing, and it really is an engaging of the patient and the family and that process and empowering them to assume that that is going to happen and to intervene...the challenge to that is that it has to roll out at the same time to anyone who would access this line. Another hospital who had done this said our big challenge was yes, we teach this in the inpatient unit and then they go to the outpatient infusion and they go, ‘Wait a second, you didn’t count with me,’ and the person who accesses the line says, ‘What are you talking about?’ So, we have to make sure that everybody knows the plan and that we are consistent in that.”* (quality leader)

Opportunities to improve patient education for prevention of CAUTIs and CLABSIs

Finally, interviewees discussed opportunities that could improve patient education for the prevention of CAUTIs and CLABSIs, including 1) use of the EMR to alert clinicians about the need to provide patients with education, and 2) involvement of patients and family members in the development of educational materials. Interviewees mentioned that patient education was often documented in the EMR, but also provided examples of how the EMR could alert providers to the need for patient education. One interviewee described the use of grouped orders in the EMR that would alert the nurse to provide education to the patient if they were at risk of developing a CAUTI or CLABSI. In another example, the EMR could help coordinate education between providers. As one interviewee explained, the EMR helped alert providers about the need for education when a patient refused the recommended care for their central line: *“So, it is now built into [the EMR] if a patient refuses to use CHG [chlorhexidine gluconate] wipes it will notify the MD [physician] or the APP [advanced practice provider] and the idea or expectation is that they will follow up and provide additional education or the same education to the patient about the importance of that practice.”* (frontline staff)

Interviewees also discussed opportunities for involving patients and families in the creation of education materials. As one interviewee explained, *“When somebody has any type of line, then teaching and training is going on, from scrub the hub, to hand hygiene, and so forth. We made patients and families part of that strategy many years ago when we actually had them refine our patient and family education related to any signage we make that has to do with that, using our patient family advisors.”* (administrative leader)

DISCUSSION

The key informants in our study identified a variety of educational resources and methods of delivering patient education that were a part of their hospital’s efforts to educate patients about infection prevention. Furthermore, key informants described important educational

topics for the prevention of CAUTIs and CLABSIs, including risk of infection, hand hygiene, necessity of device maintenance, and speaking up about handwashing, device maintenance, and device removal. In addressing these topics, key informants noted particular instances in which patient education could be especially impactful, for example when explaining the importance of device removal to patients who perceived their device as a convenience, or when convincing patients about the importance of maintenance care for their device when patients resisted this care.

Our interviewees identified the lack of standardized education about CAUTIs and CLABSIs as a major challenge to providing patient education for infection prevention. Providing standardized education may be especially important to address patient behaviors that go against infection prevention practices, such as patient resistance to device removal or maintenance care. Furthermore, delivering a unified message with patient education initiatives may also be critical to create an environment of psychological safety in which patients feel comfortable playing an active role in their care.²³ For example, although patients express interest in being involved in patient safety efforts, many may not be comfortable speaking up to their healthcare providers about concerns related to their care and safety.^{24,25} Empowering patients to speak up therefore requires the creation of an environment in which the expectation for patients to speak up is consistently made clear.^{7,23}

Interviewees also discussed opportunities to improve patient education, including the use of the EMR and patient and family advisory groups. Developing standardized policies to use the EMR to consistently deliver patient education could help ensure patients are educated about their individual needs²⁶ and help overcome inconsistencies in the use of the EMR for patient education that are already evident in the literature.^{27,28} Furthermore, patient and family advisory groups may be particularly helpful in reviewing education materials, as some of these materials for CAUTI and CLABSI prevention have been found to be difficult to understand and navigate.^{29,30}

Evidence in the literature supports initiatives to educate patients with the goal of decreasing HAIs. Patient education may reduce the risk of HAIs, for example, by reducing unnecessary device use³¹ or by increasing compliance with device maintenance.³² Furthermore, some patient education initiatives to improve clinical maintenance of indwelling urinary catheters and central lines have been associated with reduced CLABSIs^{33,34} and CAUTIs.³⁵ Efforts to enhance the effective delivery of patient education may therefore have the potential to improve patient safety outcomes.

Some limitations should be considered when interpreting the results of this study. First, the topic of patient education was not the sole focus of the data collected as a part of this study; it is possible that additional perspectives could be revealed in a study focused solely on this research topic. Second, we did not consider patient perspectives in this study. Future studies should incorporate patient perspectives to understand the needs and preferences of patients and ensure educational content is meaningful and delivered effectively. Input from patients through patient and family advisory groups may be a particularly powerful tool to learn about patient perspectives that may be unique to individual hospital settings. Finally, our study did not evaluate the impact of patient education on infection prevention outcomes.

Further work will be necessary to understand how to best implement patient education initiatives for CAUTI and CLABSI prevention, and to evaluate the impact of these initiatives on the reduction of HAIs.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1.

Hospital study site characteristics

| Site | Region | Size [‡] | Teaching hospital | CAUTI performance [‡] | CLABSI performance [‡] | Key informants | | | |
|------|-----------|-------------------|-------------------|--------------------------------|---------------------------------|------------------------|------------------|--------------------------------|-----------------|
| | | | | | | Administrative leaders | Clinical leaders | Infection prevention & quality | Frontline staff |
| 1 | Midwest | Small | Yes | Average | Average | 2 | 3 | 4 | 11 |
| 2 | Midwest | Large | Yes | Worse | Better | 2 | 11 | 8 | 11 |
| 3 | Midwest | Small | No | Average | Average | 1 | 5 | 4 | 9 |
| 4 | Northeast | Large | Yes | Average | Better | 2 | 8 | 5 | 11 |
| 5 | Northeast | Medium | Yes | Average | Better | 7 | 4 | 6 | 10 |
| 6 | Midwest | Large | Yes | Better | Average | 3 | 7 | 9 | 11 |
| 7 | Northeast | Small | No | Average | Average | 1 | 10 | 7 | 11 |
| 8 | Northeast | Large | Yes | Better | Better | 3 | 4 | 5 | 7 |
| 9 | South | Extra-large | Yes | Worse | Average | 3 | 12 | 9 | 6 |
| 10 | South | Small | No | Average | Better | 1 | 5 | 4 | 6 |
| 11 | Midwest | Extra-large | Yes | Better | Average | 3 | 21 | 10 | 12 |
| 12 | Midwest | Small | No | Average | Average | 1 | 4 | 2 | 9 |
| 13 | West | Large | No | Average | Average | 1 | 12 | 2 | 26 |
| 14 | West | Small | No | Average | Average | 4 | 10 | 1 | 11 |
| 15 | Northeast | Medium | Yes | Worse | Average | 3 | 6 | 11 | 10 |
| 16 | South | Extra-large | Yes | Better | Better | 7 | 5 | 5 | 10 |
| 17 | South | Medium | No | Average | Better | 2 | 4 | 4 | 5 |
| 18 | South | Extra large | No | Better | Better | 5 | 6 | 6 | 5 |

[‡]Hospital size is indicated by number of beds, such that small=less than 300; Medium=300-499; Large=500-899; Extra-large=900 or greater hospital beds.

[‡]Hospital performance is indicated relative to the national average according to standardized infection ratios reported by the Centers for Medicare and Medicaid Services[†] Hospital Compare data.

Table 2.

Patient education resources for prevention of CAUTIs and CLABSIs

| Resource | Supporting Quotation |
|--|--|
| <i>Paper resources (e.g., booklets, packets, handouts)</i> | “The CDC [Centers for Disease Control and Prevention] flyer that is on HAI prevention, we put that in the circulation probably over a year ago. So that way patients are informed on why it is so important that they do things like hand hygiene to reduce infections.” (clinical leader) |
| <i>Posted resources (e.g., signs, posters)</i> | “...we are also putting posters up around the hospital that outline five very clear safety habits: wash your hands, follow protocols, speak up, take care of yourself, and...what’s the fifth one?” (quality leader) |
| <i>Electronic resources (e.g., EMR, patient portals, internet)</i> | “It is the responsibility of the primary nurse to educate the patient, but we do have within our [EMR] system, we do have a lot of patient education, literature to be given to the patient.” (quality manager) |

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Table 3.

Patient education methods for prevention of CAUTIs and CLABSIs

| Method | Supporting Quotation |
|-------------------------|---|
| <i>At point of care</i> | “All nurses educate patients on a daily basis in regards to their care, their plan of care. So, if they do have a Foley, they are instructed on the importance of the care that we give them. And the importance of removing it when it needs to be removed.” (frontline manager) |
| <i>During rounding</i> | “When we go, we’re rounding on documentation, we’re rounding on the actual assessment of line—the line, the dressing, the caps, the tubing—and then talking with the patient. And we started giving information on prevention for the patient as well, as they play a part in all of this. Trying to decrease not only our central line infections, but every other type of infection that would come about.” (quality manager) |
| <i>At admission</i> | “So, part of their admission handbook and so forth goes over infection prevention, and, you know, asking people to make sure they are washing hands.” (administrative leader) |
| <i>At discharge</i> | “So, our entire discharge booklets for our patients are focused on all things, what you can and cannot do, that are infection related.” (quality leader) |

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Table 4.

Patient education content for prevention of CAUTIs and CLABSI

| Topic | Supporting Quotations |
|---|--|
| <i>Infection risks of indwelling urinary catheters and central lines (e.g., risk of infection, need to remove devices promptly)</i> | “When rounding we explain to patients like why we do certain, like if we need to pull a Foley or we discontinue certain devices, for example, a central line. We try to disseminate information to the family. Like this is the risk that this device carries.” (clinical leader) |
| | “Yeah, you have to explain what the risk is of the Foley. It’s not about convenience, it’s about, you know, this should not be in you...you are going to end up with an infection.” (frontline manager) |
| | “I think there are, I mean, because there are times where patients, believe it or not, want them in. They want to keep them in for whatever reasons. And we do have to have those conversations about why it’s important to try to get it out. Get it out sooner.” (frontline staff) |
| <i>Patient and family member hand hygiene</i> | “We do a lot of education on, you know, make sure that their people are washing their hands, they’re foaming in, they’re foaming out. Even instructing our family members, if you’re going to be touching them, you need to be washing your hands. You need to be doing this because they got the vent [ventilator], they have a Foley, they have lines that we don’t want to get infected.” (frontline staff) |
| | “If they go home with any kind of, well with anything, to wash their hands before and after you change the dressing. Or if it is their family member, we do a lot of education with their family members.” (frontline staff) |
| | “So, also for themselves, we provide them hand sanitizers and that. But they should be washing their hands before meals and that, they shouldn’t be playing with their line or family members. We go over that. And patients, I think, interaction and engagement is really important. So that’s what we kind of focus on [in] the rounds.” (frontline staff) |
| <i>Necessity of maintenance care for infection prevention</i> | “Yeah, we stress the importance of doing like Foley care and peri [perineal] care and how essential it is in help to preventing infections with Foleys.” (frontline staff) |
| | “When we do the CHG [chlorhexidine gluconate] baths, that is a big education point. Because why are you getting bathed in something that is sticky? So, that is a discussion for patients who have central lines. And often their central lines are placed here. So they have a general discussion with a vascular access nurse before they consent for things.” (frontline manager) |
| | “So, the manager in that unit put a calendar in the bathroom so that when the patient uses the CHG [chlorhexidine gluconate] foam bath, they sign off on it that they’ve done it. So again, getting them to buy-in to the importance of why we do this. And so there’s a little blurb in there that explains to the patient why this is so important.” (clinical leader) |
| <i>Speaking up (e.g., speaking up about handwashing, device maintenance, device removal)</i> | “... once we do rounding, we always go out there and encourage them to say if they see someone not washing their hands, don’t let them touch you. You know, we give them the kind of, ‘Don’t let them touch you, ask them.’ So, we are always encouraging them to ask your caregivers, ‘Are they washing their hands? Are they properly doing it?’ If they don’t understand it, ask them. So we always give them the tool to be able to be empowered to ask that.” (infection preventionist) |
| | “It’s basically empowering the patient that, this is your lifeline, you know, and that it’s okay to call nurses out or anyone out if they aren’t wearing gloves or if you don’t see them wash their hands or they don’t scrub the hub for 15 seconds. So, it’s really getting them involved in their care.” (frontline manager) |
| | “Ask if you don’t see your doctor or your nurse or tech or whatever wash your hands. ...Ask why this Foley catheter, this urinary catheter is still in when you’d really like to urinate on your own. Ask, speak up, have a question, ask about anything that you don’t understand. You should understand every single thing that’s going on. And if you don’t, you should be able to ask.” (administrative leader) |