HHS Public Access

Author manuscript

Am J Infect Control. Author manuscript; available in PMC 2023 June 28.

Published in final edited form as:

Am J Infect Control. 2021 May ; 49(5): 536–541. doi:10.1016/j.ajic.2020.09.001.

Management Practices for Leaders to Promote Infection Prevention: Lessons from a Qualitative Study

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Abstract

Background: Prevention of healthcare-associated infections (HAIs) is critical to reduce preventable deaths and healthcare costs. Variable success with HAI prevention efforts has suggested that management practices are critical to support clinical infection prevention practices. This study examined hospital leaders' management practices around the prevention of catheter-associated urinary tract infections (CAUTIs) and central line-associated bloodstream infections (CLABSIs) to identify actions that leaders can take to promote HAI prevention efforts.

Methods: We conducted interviews with 420 key informants, including managers and frontline staff, in 18 hospitals across the United States. Interviewees were asked about management practices supporting HAI prevention. We analyzed interview transcripts using rigorous qualitative methods to understand how management practices were operationalized in infection prevention efforts.

Results: Across hospitals and interviewees, three management practices were characterized as important facilitators of HAI prevention: (1) engagement of executive leadership; (2) information sharing; and (3) manager coaching. We found that visible executive leadership, efficient communication, and frequent opportunities to provide and promote learning from feedback were perceived to promote and sustain HAI prevention efforts.

Conclusions: Our findings provide insight into management practices for leaders that support successful HAI prevention. In practice, these tactics may need to be adjusted to accommodate

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the current restrictions caused by the COVID-19 pandemic, in order to maintain HAI prevention efforts as a priority.

Keywords

Infection prevention; Healthcare-associated infections; Management practices; Qualitative methods

BACKGROUND

Prevention of healthcare-associated infections (HAIs), including catheter-associated urinary tract infections (CAUTIs) and central line-associated bloodstream infections (CLABSIs), is a patient safety priority for multiple reasons; preventing HAIs can help reduce unnecessary patient morbidity, mortality, and medical costs, avoid reimbursement penalties, and improve the quality of hospital care.[1–4] While appropriate evidence-based clinical practices are critical to preventing HAIs, not all hospitals are successful with implemention. Variability in hospitals' success with implementing policies and programs to reduce infections[5] may be explained in part by the differences in management practices across hospitals.[6,7]

With respect to CLABSIs, for example, clinical "bundles" are widely accepted as key to reducing infections,[8] but hospitals that engage in specific management practices such as aggressive goal setting, systematic education, and meaningful use of data may perform better in CLABSI-reduction efforts than those that do not focus on these practices.[7] Studies have also shown that the implementation of specific management practices can be an effective approach at lowering patient mortality,[9] highlighting the potential for these practices to improve patient safety.[10] Yet despite this potential, it remains unclear how hospitals operationalize such practices, and we have limited understanding about how management practices themselves may influence infection prevention efforts.

Prior studies have suggested how the roles of leaders can contribute to infection prevention practices, where leaders within a hospital system may range from executive leadership to frontline managers. For example, visibility of leadership in clinical rounds can support psychological safety which can encourage problem solving for infection prevention.[11] Additionally, participation of leaders in employee coaching can improve workplace performance,[12] where coaching of frontline staff regarding compliance with infection prevention practices, for example, can impact improvements around device (e.g., central line) maintenance.[13]

To further explore the role of management practices for leaders in infection prevention, we examined data from a study of management practices and their role in preventing CAUTIs and CLABSIs.[14] Our results provide insight about how specific management practices of leaders can advance infection prevention efforts in the context of CAUTIs and CLABSIs, as well the prevention of HAIs more broadly.

METHODS

Study design

We conducted site visits to 18 US hospitals from September 2017 to November 2019 to learn about the role of management practices in HAI prevention, with particular attention paid to CAUTI and CLABSI prevention efforts. We focused on these two types of infections as CAUTIs and CLABSIs represent, respectively, the most prevalent and costly HAIs and are associated with considerable risks of increased patient mortality.[15,16]

Study sites and participants

Site visits were conducted at hospitals that varied with respect to geographic location and size. At each hospital, key informants were recruited to participate in study interviews based on their roles. While executive and clinical leaders were recruited for interviews with the help of site key contacts in advance of site visits, frontline staff were recruited with the assistance of clinical managers during the time of the site visit.

We interviewed a total of 420 key informants across two job categories: (1) managers–including directors leading clinical areas (e.g., unit director; nursing director of cardiac unit; intensive care unit (ICU) manager; nurse manager), infection control managers (e.g., director of infection prevention; infection prevention coordinator/manager), and administrators (e.g., quality and safety managers) (n=239); and (2) frontline staff–including nurses, infection preventionists, attending physicians (e.g., ICU physician), and resident physicians (n=181). Table 1 presents characteristics of study sites as well as numbers of key informants by type and by study site. Additional information regarding hospital characteristics of study sites is available in previously published work."[17] The Institutional Review Board of The Ohio State University approved this study and all research participants provided informed consent prior to study participation.

Data collection

Interviews were conducted using a semi-structured interview guide (available as an appendix) that included questions about management practices surrounding efforts to prevent and reduce CAUTIs, CLABSIs, and other HAIs. Interviews were held during normal work hours in hospital conference rooms and unit break rooms and were either one-on-one or group interviews, depending on staff availability. Interview length ranged from 15–60 minutes with an average of 28 minutes. All interviews were audio-recorded, transcribed verbatim, and de-identified.

Data analysis

Interview transcripts were coded and analyzed using deductive dominant thematic analysis,[18,19] allowing for categorization of data as well as identification of emergent themes across sites in order to characterize management practices important in infection prevention.

Consistent with rigorous qualitative analytic methods, we first developed a preliminary coding dictionary based on questions in the semi-structured interview guide which included the following topics: Goal Setting and Support, Leadership, Strategic Alignment/

Communication and Information Sharing. Then, using this preliminary dictionary, three members of the coding team coded the same five transcripts, noting new codes that emerged from the data. These new codes were incorporated into a revised coding dictionary, and the coding team then coded all of the interviews from the first five site visits. The coding team was overseen by the lead investigator and met regularly throughout the coding process to ensure consistency in coding.

As new themes emerged from the data, new iterations of the coding dictionary were developed, and coders re-coded transcripts to incorporate the new codes. After coding and re-coding of transcripts from the first five sites was completed, the coders used the updated coding dictionary and same iterative coding process to code transcripts from the remaining 13 sites. This approach allowed for synthesis of themes across sites and rich characterization of management practices operationalized in infection prevention efforts. The ATLAS.ti qualitative analysis software (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany) was used to support these analyses.

RESULTS

Our analysis revealed three specific practices for leaders that appeared to be central in HAI prevention efforts: engagement of executive leadership, information sharing, and manager coaching. Below we discuss each management practice in more detail.

Engagement of executive leadership

Managers and frontline staff emphasized the importance of executive leadership (e.g., chief executive officer, senior vice president) engagement in HAI prevention efforts because it demonstrated that infection prevention goals were a priority for the organization and leadership visibility promoted open communication with managers and frontline staff. Examples of this practice showed 1) executive leaders attempted to emphasize the infection prevention priorities and goals of their hospital as they engaged staff in HAI prevention efforts, and 2) visibility of executive leadership was reportedly valued by managers and frontline staff because it enabled open communication with someone who was empowered to make change. Representative quotations are presented in Table 2.

Information sharing

Interviewees across studied hospitals also identified information sharing as critical in supporting their infection prevention efforts. Specifically, managers and frontline staff described three methods of communicating information: 1) sharing information electronically, 2) displaying information on the unit, and 3) discussing information in person. First, e-mailing information was recognized as a common way to communicate about infection data and infection prevention goals to frontline staff. Second, displaying information on the unit via bulletin boards or huddle boards was also identified as useful for providing staff with timely feedback about their progress towards infection prevention goals. Third, both frontline staff and managers explained that sharing of infection data was often accompanied by in-person discussions, which were also highlighted as an important activity. Representative quotations are presented in Table 3.

Manager Coaching

Across hospitals, comments by managers and directors emphasized the importance of manager coaching to encourage frontline staff to use best clinical practices in infection prevention. Specifically, they described two coaching activities: 1) providing staff with feedback on how to perform clinical care processes correctly, and 2) re-educating staff on best practices for infection prevention. First, coaching by managers was important particularly in providing feedback about how to improve after deficiencies in clinical infection prevention practices were identified. Managers also noted that coaching provided an opportunity to re-educate frontline staff on best practices in infection prevention. These learning opportunities helped staff identify and implement process changes that were necessary to address a problem. Representative quotations highlighting the practice of manager coaching are presented in Table 4.

DISCUSSION

While appropriate clinical practices are critical to infection prevention, management practices are also important as they can influence how clinical practices are implemented, monitored, and sustained.[7] Managers and frontline staff in our study described three management practices–engagement of executive leadership, information sharing, and manager coaching–that supported HAI prevention and reduction efforts in the context of CAUTIs and CLABSIs. Of note, these management practices were identified during a study period prior to the emergence of the COVID-19 pandemic, thus implementation of such practices may need to be modified to accommodate the restrictions and challenges of present hospital environments.

First, visible leadership was identified as critical in supporting infection prevention practices. Hospital staff need to feel the commitment and involvement of their leaders to direct and sustain their efforts. Prior research has shown that consistent face-to-face interactions with hospital leaders can provide opportunities for frontline staff to raise concerns about or suggest ways to improve infection prevention efforts.[20] In the context of the COVID-19 pandemic, leaders may have to think creatively to adjust their methods of engaging with hospital staff to respect the current rules and recommendations for maintaining physical distance.[21] Leadership rounds, frontline staff huddles, and providing recognition to staff may look different in the present crisis, but the importance of maintaining leadership engagement cannot be underemphasized. Consistent visibility through daily email updates or routinely scheduled video-conferences may help these leaders signal their engagement when they cannot be physically present.

Second, timely and efficient information sharing, whether through emails, bulletin boards, and/or huddles, was found to make frontline staff more aware of and up-to-date with HAI information. Additional communication strategies including practice guidelines, education, and mass media have also been suggested as effective means to share infection prevention information.[22] Communication is especially important given the evolving environment caused by the COVID-19 pandemic, as protocols, practices, and guidelines are changing rapidly and need to be updated and shared almost daily. In this situation, sharing information via electronic medical record alerts, targeted emails, town halls, or webinars, rather than

through face-to-face interactions, may be valuable approaches to communicate clinical practice changes while taking precautions to reduce in-person interactions.[23] However, in choosing their communication strategies, hospital leaders should also be sensitive to the risk of information overload,[24] especially given the volume and frequency of communications that have been necessary as the COVID-19 pandemic has evolved.

Finally, manager coaching through feedback and providing real-time education to address identified deficiencies in clinical infection prevention practices was found to be vital to HAI prevention. Coaching may be particularly valuable to support infection prevention efforts as it is perceived to effectively communicate actionable information.[13] Currently, hospitals are adapting to changing practices in light of the challenges of the COVID-19 pandemic, as well as adjusting to accommodate limitations in clinical practices due to shortages of work force and supplies. As such, managers will have to ensure frontline staff are prepared for and capable of changing their behaviors as clinical policies are updated.[25] The required flexibility may be overwhelming for frontline staff, who will need coaching to ensure they are adhering to the most up-to-date practices based on both evidence and their hospital's resources.

Limitations

Because our study focused on investigating management practices to prevent CAUTIs and CLABSIs, our questions asked participants to comment on their experiences in this context. Nonetheless, we believe that the consistency of our findings across hospitals around these management practices are likely transferable to other HAI prevention efforts, despite differences in clinical practices that will vary based on the specific infections being addressed. A second limitation of our study is our inability to link the management practices we characterized to unit level performance, as publicly available HAI data is made available only at the hospital level. Given there is variation in performance among units of the same hospital, the perspectives we collected on best management practices for infection prevention also likely reflect this variability. Additional research is needed to assess the impact of these management practices on individual HAI prevention metrics, as well as examine how combinations of management practices might be most effective at preventing specific HAIs.

CONCLUSIONS

Having engaged executive leaders, effectively sharing information, and providing feedback to frontline staff can help hospitals' HAI prevention efforts. As clinical practices continue to evolve during the COVID-19 pandemic, hospitals should not lose sight of the importance of management practices in the context of infection prevention. Adapting these management strategies for leaders to accommodate the restrictions of hospital environments during the COVID-19 pandemic can ensure that focus on HAI prevention is maintained.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

ACKNOWLEGEMENTS

The authors thank Lindsey Sova, Jaclyn Volney, Toby Weinert, Jeanette Gardner, Natalie Gaines, Caroline Sugar, and Meg Suttle, all affiliated with the authors' organization, for their assistance with this project. The authors are also grateful to the hospital managers and frontline staff who participated in this study.

This research was supported by the Agency for Healthcare Research and Quality R01HS024958. The views expressed in this paper are solely those of the authors and do not represent any US government agency or any institutions with which the authors are affiliated. The funding source played no role in study design, data acquisition, analysis, or decision to report these data. The findings and conclusions of this study are those of the authors and do not represent the views of the Agency for Healthcare Research and Quality or the US Federal Government.

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Table 1

Hospital and key informant characteristics

Hospital			Key informants (n=420)	
Site #	Size[1]	Region	Managers	Frontline staff
1	Extra Large	Midwest	31	12
2	Small	Midwest	6	9
3	Medium	Northeast	17	10
4	Medium	South	8	5
5	Small	Northeast	17	11
6	Small	West	11	11
7	Large	West	14	26
8	Medium	South	12	5
9	Large	Northeast	13	11
10	Medium	Northeast	10	10
11	Small	Midwest	7	11
12	Small	Midwest	9	9
13	Large	Midwest	19	11
14	Large	Midwest	16	11
15	Large	Northeast	9	7
16	Extra Large	South	10	10
17	Small	South	9	6
18	Extra Large	South	21	6

[1] small–less than 300 beds; medium–300 to 499 beds; large–500 to 899 beds; extra-large–900 beds or more.

Table 2

Representative quotations highlighting engagement of executive leaders

Engagement methods of executive leaders	Representative quotations
Demonstrates infection prevention goals are a priority	"So, they [hospital leadership] are making these goals, I would say. And I would think that that sends a strong message that it is a priority in the institution. And they do drive these committee formations throughout the hospital…through those types of initiatives that it is apparent that that is something that they are looking at." *nurse* "There is a system quality meeting that happens once a month…one hospital will be assigned to report out their quality metrics to the entire group at that meeting each month. So, last time [hospital x] went and was giving out their quality metrics. And when we were kind of struggling with the CAUTI stuff, the system VP [vice president] for quality reached out to [hospital y], that had a really good CAUTI rate at the time, for them to kind of touch base and figure out what they were doing that worked for them." *physician* "Well we develop formal goals annually. And I can say with confidence that reducing infections has without a doubt been one of our highest priorities for our two acute care hospitals in particular over the last three or four years especially. And that's really demonstrated by the commitment that leadership showed with a complete re-vamp of our hand hygiene program… When we collected our baseline data, we were about in the 50 percent in terms of hand hygiene compliance, and we have been reliably like 89, 90 percent now. We've come a long, long way but with a lot of work. So I think having had that particular project set as a high priority goal for the organization the data is shared with our governing body and there are regular reports. It really has demonstrated the level of importance that our senior leaders have placed on this. And that's because they know the impact of improving hand hygiene and reducing HAIs." *director* "I do think it helps to have involvement from the highest levels of leadership, yeah it makes sense. You know part of the feedback they got on our most recent 'rounding to influence' event was that we now have lots of data which we didn't always have. We have lots of data, but staff doesn't know where to focus it as a priority. So when you have the CAO [chief administrative officer], the senior VP [vice president] out in front of something, that is real clear that you are supposed to focus on that." *unit director*
Visibility promotes open communication	"I think we see our senior leaders a lot. They are very involved…our senior team is very visible and very much involved in the day to day. They know. They're in the huddles or they're on the calls. And the senior team all comes to huddle in the morning if they are able, if their schedules permit. So, we see them all the time." *nurse manager* "He [CEO] would come here in the ICU [intensive care unit] once a week…and come sit with us. 'What are your issues? Tell me.' And he would have notepads. Everything would be kind of written down. Everything would be followed through. We would get a call back from him. So I think that makes it so much more easier." *ICU physician* "We have strong leadership support. And by the support I don't mean permission, I mean active involvement. And I think that makes a huge difference. Well, for example, if we have a CAUTI or a CLABSI, and we'll talk about that, leadership, first of all, wants the details. They want to know what's going on. They work with our team... You know, what we can do next to implement it from a resource perspective." *infection preventionist* "I think number one, management is approachable here. I mean we feel comfortable requesting meetings with any member of management that we think is appropriate to a given situation. We feel like they know us. We feel like they hear our concerns and they understand. We, you know, it is not like we are approaching this with people who are never with us on the front lines. We see, you know, our CNO [chief nursing operator] here, we see our chief medical officer here. And you know, just being able to have that open dialogue and communication is really important. So, I would say that is number one is the ability to feel comfortable engaging with them." *unit director*

Table 3

Representative quotations highlighting information sharing

Methods of information sharing	Representative quotations
Sharing information electronically	"Yeah, it's just an excel. Yeah, it's just an email and we send them an updated graph. For CLABSI and CAUTI we do, 'It's been this many days since your last infections.' " *infection preventionist* "Every month the infectious disease manager sends out an email saying when our last CAUTI was, and then which department, how many they had." *nurse* "There's a monthly email they send out to let us know how many days we've gone without each respective thing [infection]. They send us a graph, so we can chart it. So it's a visual for the staff." *nurse* "We have monthly report that comes from the infection preventionist… They send out rate of infections, how many infections have occurred on each unit, specific infection, how many days since the last infection, and what our goals are…" *nurse*
Displaying information on the unit	"We distribute it [quality statistics]. We put it on the units and we tried it, you know different units. Different units may try to display it differently to make it, you know, speak to their staff a little bit better, or enlarge it so that it's more visible." *ICU manager* "That [goals and infection data] is also communicated in our huddle boards. ...So, they have what their goal is, where they are currently. If they are 50% right now, it's in the red right there at 50%. So everybody in that unit knows that we are below our goal, we need to work on it. So, that board's a great communication for the staff which includes the night time staff because it's up there." *unit manager* "The bar graphs, the reports, are posted in our break room of the infections and what the standard is and what we're expecting..." *nurse* "There's a giant board when you walk in. A lot of times they will give us a printout. We have a bulletin board in our breakroom that kind of has all of that on there. It has a printout so we can see and compare. Last month, this month, overall, or other regional hospitals." *nurse*
In-person discussion of information	"I do it personally. We share it…and what I noticed is my charge nurses will write it on their whiteboard or some of them just take it, paperclip it, and then they talk about it during shift huddles." *nurse manager* "We get the report or scorecard monthly, and then we use it on the huddle boards that we have. Our emails, we talk about it daily in our huddles. So it...staff meetings, any time you got your information, you let them know how you're doing, how well we are doing, or what we need to improve on." *nurse manager* "If there is one that happens, then they do talk about it in the huddle and explain possibly maybe what happened and whether or not it was hospital acquired, and then what we can maybe do to prevent that from happening again. So yeah, it is definitely a big discussion or priority I feel like in a lot of things." *nurse* "We talk about it in huddles. They have a sheet that comes out… it lets us know–not only our unit, but in the whole hospital–how many CLABSIs and CAUTIs there were and from what unit specifically they were from or where they were found. After we go over it in huddles, it will be posted in our break room." *nurse*

Table 4.

Representative quotations highlighting manager coaching

Manager coaching activities	Representative quotations
Feedback about clinical practices	"The assistant nurse managers each had certain things they would audit. And the one that was auditing the central line and Foley infections would send out an email at first, reminding people or reminding a specific person saying, 'Hey I noticed in your documentation…' " *nurse manager* "Performance improvement referral forms… It is an opportunity- so if we see that if [name] didn't do Foley care three nights in a row, then we say this is what happened. And then [name] has an opportunity to say, 'Oh, you know what, this is why I couldn't do it.' That way we all come together and we get feedback from them or thank you for reminding me." *infection prevention coordinator/manager* "Our charge nurses also go in and inspect the central line dressings on any patient that has one. They will give feedback to the nurses that are taking care of them if they feel that it needs to be changed more frequently than we normally do. Or if they see that they have something that's loose, or maybe somebody that needs to be shaved to get a nice good seal with that dressing. I just think that management talks about it, the charge nurses talk about it, the staff nurses are talking about it. It's just all that attention and constant, having that constant awareness, I think, is what is helping us be successful with those things." *manager* "There is a constant tracking and feedback to providers. You know, if there was an event, what could have been done differently to avoid this infection? Was it avoidable? You know, usually they are. And what could have been done differently?" *unit director*
Re-education to improve infection prevention practices	"So, if they find a line that's missing a swab-cap, they'll talk to the primary nurse real-time and just do some re-education and remediation right at that time. So it gets corrected real-time." *director of infection prevention* "If there is something that is new or something that we need to adjust, or if we see a pattern or, you know, if there are any more than one event that is concerning, then we do just in the moment teaching basically. We will huddle with the staff and say we need to cover or re-educate everybody." *nursing director of cardiac unit* "When we didn't follow protocol or something didn't go right, to immediately address that. And we have a culture where, okay, we address it. We don't act like it didn't happen. Because the greater good is then we can talk about that, and so we do. I mean when people identify things that didn't go as we had planned, we talk about them and use it as a learning moment." *nurse manager* "I think coaching is important. I think that we use huddles a lot, where we are educating people right at shift change several times a day on the unit, talking about those things, giving feedback, and giving praise when its necessary. And then using the patient's story to make it real." *physician chief of staff*