Major Article

# Kamishibai cards to sustain evidence-based practices to reduce healthcare−associated infections

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**Background:** Sustaining healthcare-associated infection (HAI) prevention practices is complex. We examined the use of Kamishibai Cards (K Cards) as a tool to encourage compliance interactions between leaders and staff.
**Methods:** We explored one unit of a children's hospital to assess acceptability of K Cards. Interactions were recorded (n = 14), and interviews were conducted (n = 22). We used the Health Belief Model (HBM) for analyses. Central line utilization, bundle compliance and rates of HAIs were also examined.
**Results:** Staff members consider K Card interactions reminders of bundle elements and acceptable for creating positive interactions. Although no causal inference can be made, during K Card implementation, CLABSI rates dropped from 1.83 in 2015 to 0.0 through June 2018. Central line utilization decreased by 3%.
**Discussion:** Moving beyond theory to providing practical sustainability tools is an important implementation step. Although our findings are not generalizable, capturing what occurred on one unit provides opportunity to discover how key leadership factors (communication and leadership style) influence the uptake, acceptability and sustained adoption of evidence-based practices.
**Conclusions:** K Cards are a practical tool to sustain evidence-based practices and promote communication between leadership and staff - keeping compliance on the minds of frontline workers.
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One in 25 patients in the United States will contract at least 1 healthcare−associated infection (HAI) during treatment.[1,2] Research shows that HAIs are largely preventable when evidence-based prevention measures are employed and sustained with a high degree of fidelity.[1,3−6] Given the magnitude of this problem, many governmental agencies, such as the Veterans Health Administration, the Centers for Medicare & Medicaid Services, and the Agency for Healthcare Research and Quality, as well as networks like Children's Hospitals' Solutions for Patient Safety, are promoting best practices for HAI reduction.[7−11]

Many evidence-based guidelines, bundles, and toolkits now exist,[12−14] but even with national efforts to disseminate and implement these guidelines,[15] there are difficulties associated with sustaining HAI prevention practices.[16,17] A bundle is defined as a structured set of 3-5 evidence-based practices that, when performed collectively and reliably, has been proven to improve patient outcomes.[18] Promoting sustained implementation of bundles with a high degree of fidelity is critical in reducing HAIs, and infection control experts have therefore emphasized moving research into real-world practice using implementation science methods and principles.[19] Three core elements are emphasized for successful implementation: the level and nature of the evidence, the context or environment into which research is to be placed, and the method or way in which the process is facilitated.[20] Although there is limited understanding regarding which approaches are most effective in different contexts,[21,22] facilitating the process is considered necessary to enable sustained implementation.[19]

The use of Kamishibai cards (K cards) can facilitate interaction between leaders and frontline staff. The use of K cards is not new. Kamishibai is an ancient Japanese art form that has now established itself as a notable management tool in manufacturing environments such as the Toyota Production System.[23] The word *Kamishibai* means "paper drama," as the craft was practiced in Japanese Buddhist temples. Monks used this storytelling art form in the 12th century to convey moral lessons to their audience.[24]

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Although not widely used in healthcare, K cards have been used in daily rounding to improve bundle compliance to prevent harm from HAIs. Spectrum Health Helen DeVos Children's Hospital in Grand Rapids, Michigan, describes their use of K cards as the "right blend of safety culture, quality improvement and process improvement work." Their work was highlighted in 2017 at the Quality and Safety in Children's Health Conference, as this hospital saw a significant increase in bundle compliance. It was also reported that an immediate outcome was an increase in staff awareness of HAIs.[25]

Recently, some healthcare institutions have adopted K cards as a method to increase safety compliance.[25,26] For example, at 1 institution, rounding cards were developed to audit bedside care. Leaders were provided a template "card" by the safety and quality team to conduct rounds and facilitate conversations with frontline staff.[26] In these conversations, a checklist of bundle elements was discussed, with a goal of completing all items on the checklist at least 90% of the time. It was reported that safety compliance increased from 70% to more than 90%, according to internal audits, after K cards were implemented.[25]

Translating evidence into routine practice is challenging enough, but sustaining new or improved practice bundles is even more difficult, especially in healthcare settings with many levels of staff, shift work, patient and family needs, and workflow issues. There are few studies addressing sustainability of HAI prevention bundles, and most are related to hand hygiene.[27−29] No studies address the use of K cards to facilitate and sustain evidence-based practices to reduce HAIs. A change may be needed in how we describe sustainability— moving from thinking about sustainability as leading in a linear manner to 1 outcome to thinking about sustainability as an integrative process of adaptation, communication, learning environment, and continuous staff development.[30−32]

We conducted this study to highlight 1 (pediatric) unit's innovative use of K cards to facilitate adaptation of best practices and continuous learning through ongoing communication between unit leaders and staff. We provide key themes related to the process of implementing K cards, how K cards can sustain evidence-based practices, perceptions of staff, and preliminary outcomes.

## METHODS

This qualitative study is nonexperimental and focused on evaluating 1 unit's use of K cards; it employs an ethnographic approach involving observations of K card interactions (primarily 1-to-1 conversations) and interviews with unit staff members. This study was considered quality improvement and deemed exempt by the institutional review board of record. Verbal consent was obtained from participants at the time of recording or interview.

### Data collection

We observed and recorded 14 K card interactions within a 6-week time period. These audio-recorded observations were conducted at a time convenient for the unit leaders since these interactions were dependent on the availability of the unit leaders to initiate the interaction. K card interactions between the unit leaders and frontline staff were recorded at the nurses' station in real time.

We also conducted face-to-face interviews with 20 staff nurses and 2 nurse leaders to uncover staff and unit leader perceptions regarding the K card initiative. These semi-structured interviews were conducted by an experience interviewer (G.S.) and were completed over a period of 8 months. We used an interview guide with optional probes to encourage dialogue. Each interview was 15-30 minutes in length, audio recorded and transcribed for data analysis. All audio recordings were transcribed using a professional transcription service; the same transcriber was used for all

interviews. Interviews were also conducted with those who led the effort—the nurse leaders. We asked questions about their role in implementing K cards and introduced the emergent themes we heard from frontline staff interviews. These interviews addressed the implementation process (how K cards were rolled out) and included questions about potential replication.

As part of the hospital's protocol for monitoring infection rates, central line−associated bloodstream infection (CLABSI) and catheter-associated urinary tract infection (CAUTI) rates for this unit are collected on a routine basis in addition to bundle compliance percentages per month. Bundle compliance is measured through audits. The audit tool is completed by the charge nurse, clinical nurse specialist, or nurse manager only to ensure reliable data collection (vs self-auditing).

### Data analysis

Recordings of observations were transcribed and reviewed by the study team for recurring themes. Themes were used to construct the questions for follow-up interviews. We used an inductive thematic analysis strategy. One coder used NVivo software Version 10 (QSR International, Melbourne, Australia), with a second coder using DeDoose (SocioCultural Research Consultants, Los Angeles, CA). The code set was established through line-by-line coding, generating major themes that were reviewed and modified by the study team (G.S. and M.J.K.). Recurrent themes were identified through comparison, and quotes were extracted from the data. Themes were organized and mapped to constructs of the health belief model (HBM).[33−35] A codebook was generated and agreed upon by the authors (G.S. and M.J.K.) after several iterations. Interviews were coded separately, and results were compared.

We used the HBM because its constructs emphasize perceptions of susceptibility, barriers, benefits, and cues to action (Fig 1), and the model has previously been used in describing engagement in health services initiatives such as patient safety.[35] The HBM provided a framework to explore how frontline staff perceptions affect perceived role and likelihood of action once presented with a cue from the K cards. The use of the HBM to assess staff perceptions represents a theoretically grounded approach to describing the roles of nursing staff in HAI prevention efforts.

## RESULTS

### Observation results

K cards were created by the hospital HAI leaders in partnership with Children's Hospitals' Solutions for Patient Safety and then given to the nurse leaders on the unit. These leaders adapted the K cards using an iterative process, incorporating staff feedback. The leaders drafted the cards and sought feedback from HAI teams (including infection preventionists) within the unit before the initial roll-out period. After K card implementation commenced, feedback from staff members obtained via actual K card interactions informed further modifications to the cards. We found each interaction to be very short (3-7 minutes), and interactions were usually conducted at the nurses' station. Most K card interactions on this unit were done during the day shift, but time of day was flexible and negotiable, depending on the availability of staff. The nurse leaders on the unit led all K card interactions, with frontline staff invited to participate in a K card interaction based on the presence of HAI risk factors, such as a Foley catheter or central line for a patient or patients on the unit. In most cases, the nurse leaders approached the staff member and asked if there was time to "conduct a K card." The frontline staff person had the option to accept or decline the invitation, depending on the timing of other nursing care duties. On average, the nurse leaders launched K card interactions 7 times per week, with a goal of
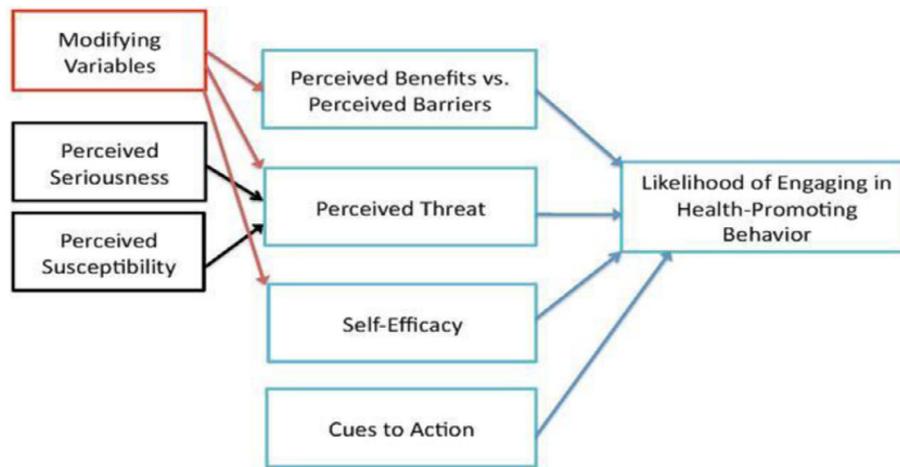
**Fig 1.** The health belief model.[35]

completing 1 on each side of the unit (10 interactions total) during weekdays.

Nurse leaders began the interaction (conversation) by asking 3 or 4 focused questions about the HAI bundle (outlined on each card) as it related to a specific patient. The bundle consisted of a set of standardized evidence-based guidelines and protocols related to CAUTI and CLABSI. A typical CLABSI K card interaction for this case study would include the following steps:

- Unit leadership identifies a staff member who is caring for a patient with a central line.
- Leader verifies that the staff member has 5 minutes to engage in a K card interaction.
- Leader reviews bundle elements of the K card, including:
  ○ Why does this patient have a central line and is it still necessary?
  ○ Frequency of dressing change or what conditions would prompt an earlier dressing change?
  ○ How do you assess line patency? What action do you take if line sluggish/not flushing?
  ○ How do you safely access a central line? How do you ensure you are following that process 100% of the time?
  ○ How often are CHG [chlorhexidine gluconate] treatments given in patients with a central line?
- Documentation is reviewed with the frontline nurse in the moment. The leader praises the nurse for meeting bundle elements and provides feedback on missed elements.

During K card interactions, staff appeared to be encouraged to engage in problem-solving with leaders by discussing barriers and facilitators to implementation. If a nurse answered a K card question incorrectly or there was lack of documentation, the leader and staff member discussed correct bundle implementation and how they, as unit leaders and staff, could overcome barriers. The result was a learning opportunity for staff that was facilitated by positive interactions and problem-solving with nurse leaders. Changes to bundle implementation and documentation processes were also observed as a direct result of the K card interaction. For example, there was a lack of knowledge about all the steps that needed to be performed per policy. Therefore, the knowledge deficit identified regarding policy was incorporated into the K card for education and reinforcement.

Results of K card interactions were posted to a whiteboard next to the nurses' station (with 1 board at each end of the unit for purposes of high visibility). K cards could either be "green," which meant that everything was answered or documented correctly during the interaction, or "red," meaning there was a lack of documentation or an incorrect answer. The outcome of the card interaction (green or red) was posted on the board along with a written explanation of what was missed. The staff member was not identified. Staff member feedback showed that lack of identification promoted group ownership of bundle compliance and more positive interactions using K cards. The board was also a visual cue to heighten awareness of bundle components. The visual presentation has been altered over time. The current board, with its green and red dots, is a more powerful visual management tool for staff and allows them to see in-the-moment unit bundle compliance. The K cards themselves are located next to the board for staff to review at any time.

*Interview results*

Interviews with frontline staff revealed 10 themes (Table 1). We divided these themes into 3 categories: (1) implementation barriers (what hinders the process), (2) cues to action, and (3) implementation facilitators (what helps the process). In addition to unit leaders' ability to create a nonthreatening interaction, many staff members commented on the short duration of K card interactions as a facilitator. Staff commented on the learning that takes place during a K card interaction, which is reinforced by whiteboards of K cards in the hallway and the electronic medical record. These are all constant reminders of best practice bundles. Some staff members expressed apprehension about having to answer bundle questions from their supervisor, but many indicated this fear became nonexistent once K cards were implemented regularly. Key themes are illustrated by quotes from frontline staff (Table 1).

Benefits of using K cards were acknowledged from both leadership and frontline staff perspectives. Both staff and leaders recognized that K cards (1) facilitate patient and family education, (2) improve unit bundle compliance, (3) remind staff of bundle components, (4) set a unit-level learning climate, (5) promote staff engagement in problem-solving, (6) serve as an audit in real time, (7) promote the importance of unit quality metrics, and (8) facilitate individual roles in the prevention of HAIs. Key themes are illustrated by quotes from both leaders and frontline staff members (Tables 2 and 3).

We interviewed the 2 nurse leaders who developed and implemented K cards on the unit. From their perspective, K cards help to facilitate positive interactions with staff and serve as a way for staff and leadership to problem-solve together about bundle

**Table 1**
Interview themes and quotes from frontline staff

| Interview themes | Participant quotes (20 interviews from 1 pediatric unit) |
| --- | --- |
| **Barriers** | |
| Apprehension about failure | "I think it's really helpful when [the nurse manager] does it because it has that authority behind it . . . And just as a personal sense of pride, I want it to be perfect when she does it." |
| | "Someone in authority is asking you these questions that you're supposed to know, and if you don't know them, it's always awkward . . . But then, once I walked through one, it wasn't as scary as I thought it was going to be." |
| Implementation consistency | "I feel like it's kind of slowly drifted down in how often we're actually doing them. I think that makes a big difference too in our compliance with issues, [and] I do think if the consistency isn't there, it's not kept fresh in people's minds." |
| | "But I think you have [to] keep doing them because once we kind of fall off, then people kind of start to fall off too." |
| Time commitment | "I don't think people would be as open to doing them as often if it took ten minutes or more . . . I think people would just feel overwhelmed and not appreciate it as much." |
| | "I would say maybe the only thing is just that if people are busy, having a hard time saying okay, I'll take five minutes, when I have something else I could be doing." |
| **Cues to action** | |
| Reminders of bundle elements | "It reinforced education. It reinforced policy: why do we do these things? It made me walk into a room and kind of see the room a little differently. Like do I have all these things done? Like is this safe for my patient?" |
| | "And then, while doing the K card, we realized that I didn't have a leaf up outside the patient's door . . . which makes them noncompliant because then we're missing visual cues, [so] it's nice to get that in-the-moment feedback [so] you can intervene and make that change there and then." |
| Electronic medical record | "If you just have a question, you can look at [the K card] and all of the things we have to do to be compliant. So, if you can't remember something, you can go and just look at the board whenever you want." |
| | "Say I saw somebody else doing a green card and I'm at the computer and I had an extra second [and] I have a central line too, I [can] check my education. [It's] just another reminder and another way for better communication and follow up." |
| Viewing the board | "I think people are more aware of stuff, and [the board] is always right next to the nurses' station. You're looking at it all the time and being reminded. And there's not an excuse that you didn't know." |
| | "I think it brings awareness by having a visual for the unit to see. Like, hey, we didn't do so good; someone didn't get their CHG bath. And then we take ownership of it. And I know both the nurses and the nursing assistants work together on these." |
| **Facilitators** | |
| Duration of time commitment | "I thought it was cool because it's really quick. It doesn't take a long time. That's the only like skeptical thing I had. I was like, oh, wow, are we going to be sitting here for ten minutes talking about this? But it's really just like a two-minute, boom, boom, boom kind of thing." |
| K cards are nonthreatening | "It is definitely better to get the green card . . . It feels good to get a green card, especially if you were the person admitting the patient. But it's not a bad thing to get a red. It's just room for improvement." |
| | "Instead of people running into rooms when they'd see the nurse leaders come down the hall (because they knew she was going to do K cards) people are more willing to say, yeah, I'll do one. I haven't done this one in a long time, so let's do it to refresh my memory. People were more open to actually learning information from them and found them helpful." |
| Leaders show support (positive language used) | "The nurse leaders are just very easy-to-talk-to people, so that helps too. But then if you do mess something up, they just answer in a nice way. It doesn't make you feel intimidated or stupid." |
| | "Our manager makes them kind of fun. She almost does a cartwheel when you get it right, and so it's just like a big celebration. And no matter how many times you do it, she's always so proud." |
| Leaders support a learning climate | "So, if we give the wrong answer, then we are educated. We are nicely told the right answer. And then as far as the K card goes, we get a red card, which red is not a bad thing. It just means that we have some improving to do. There's no punishment or anything like that." |
| | "Our nurse manager frames it very well so that it's not that we're doing something wrong. But we're using this as an opportunity to grow and making the best out of everything, so focusing from that aspect of it, being more positive and making sure we don't continue to make the same mistakes over again." |

*CHG*, chlorhexidine gluconate; *K cards*, Kamishibai cards.

implementation. Unit leaders also indicated that K cards are flexible enough to allow for adaptation, depending on changes in bundle components or policy. Unit leaders felt strongly that K cards need consistency (ie, regular interactions with staff) and that success may be somewhat dependent on who is leading the effort and the climate set by unit leadership.

For example, nurse leaders indicated that a natural outcome of K card interactions was a coaching element related to line days and how to have conversations about line days with providers. Nurse leaders indicated that K cards gave them the opportunity to discuss potential conversations with the nurse—conversations nurses may need to have with providers—and the knowledge about when to escalate issues with providers. Themes from the nurse leader interviews are illustrated by quotes in Table 3.

*CAUTI and CLABSI rates and compliance results*

Although a causal inference cannot be made, during the time of K card implementation (March 2017 to July 2018), CLABSI rates on the unit (measured by number of infections per 1,000 line days) dropped from 1.83 in 2015 to 0.81 in 2016 to 0.0 as of July 2018. Line days were measured as the total number of days a central line or catheter was in place for each patient. The count was performed daily. Central line utilization decreased by 3% during the same period. CAUTI rates remained at 0.0 from 2015 through September 2017, but urinary catheter days decreased, and catheter utilization decreased from 4.1% to 3.6%. CLABSI bundle compliance trended the same (80%) from March 2017 through June 2018. CAUTI bundle compliance trended upward from 20% in March 2017 to close to 50% through June 2018.

**DISCUSSION**

K card interactions and interviews indicate K cards are beneficial in reminding unit leaders and frontline healthcare workers about sustaining evidence-based bundle components. The use of K cards opens lines of communication between those on the frontline and those in unit leadership positions. Implementing K cards may take time

**Table 2**
Perceptions of K cards

| Perceptions | Participant quotes (20 interviews from 1 pediatric unit) |
|---|---|
| Facilitates patient and family education | "Even if you think the previous nurse did it, you can just reiterate and go over it again with the patient or parents just to make sure they have a complete understanding of what's going on. And then, with some of them, we do a bedside safety check as well." |
| | "I think K cards were just more in place for patient safety and trying to decrease the amount of CAUTIs and CLABSIs that we have. I didn't even realize the things that we could be documenting on for the education portion of things." |
| Improves unit bundle compliance | "It's good to have frequent reminding of those important things on the K cards because . . . when we're busy, it's easy to forget documentation . . . If you're having that stuff brought to your attention, it's a lot easier to make sure that you get that stuff done in that timely fashion." |
| | "I definitely think that being consistent and using the K cards makes people more aware, more compliant with their bundle, and actually doing [sic] the things to make them compliant. Assessing the line every day, talking about the line in rounds every day, charting on what the line looks like is because of the K cards." |
| K cards are reminders of bundle components | "I think they are helpful because we never talked about it much before, and now we talk at least once a week, even sometimes more than that . . . about what's in a specific bundle." |
| | "I think it's good for nurses to verbalize what we're doing because sometimes we move so fast. And we have a million things going through our mind. We have these little checklists, and it's like, oh, yeah. Just talking about it out loud is useful." |
| Sets a learning climate | "I like the way [the K cards] work by helping to educate people, but you're educating by allowing staff to come to an understanding themselves rather than just saying, oh, hey, you didn't follow this or you didn't document on this." |
| | "It's a good teaching moment because it's an actual process. You tend to remember that more [than] if you didn't get it right . . . even though there was no real downside to getting it wrong." |
| | "It's nice to learn from other people too, like what they didn't do or did, or how they got to a certain answer". |
| Staff engage in problem-solving with leaders | "So initially, it was [the nurse manager] doing all the K cards, but I think it was also helpful for her to see our side of the story of why things weren't done." |
| | "I think it's especially helpful to have the CNS there because one time we were trying to chart on this catheter and we couldn't get it to come down to the education. That's kind of her role to follow up with these people. Like where is that education and why isn't [it] coming into the patient's chart and what could we do to fix it?" |
| How K card bundle relates to audits | "The K card itself is more of an interactive process than an audit is. I don't ever find the person to do an audit. Maybe if I see them in the hall and I know I'm going to audit their patient, I ask them if it's okay if I do a[n] audit." |
| Importance of unit quality metrics | "Before the K cards, I didn't really know where we stood on our bundles and what we were working on. Every HAC has its own team, and they kind of talk amongst themselves. And it's hard to get that information out to everybody, so this is just a one-stop place [for] how we're doing." |
| | "I think HAI's always a concern because, especially with the hospital getting reimbursed, it costs a lot more money, and it harms the patient too. So, I think anywhere that we can improve, if our numbers aren't zero, there's something we should be doing to improve those numbers, just because we want to keep our patients safe." |
| Knowledge of individual role in preventing HAIs | "I'm happy we did the K cards because I've gotten a positive experience out of them compared to people who don't know what they are. I feel like I know more and practice better because of knowing them and working with them." |
| | "We never want to cause harm to any of the kids, and obviously an infection can not only [sic] be traumatic for the patient, in that they usually are experiencing fevers. It's scary to think that you have bacteria in your blood . . . And it's totally something that we have a role in preventing. So, it would obviously feel terrible to know that like something you did or didn't do may have caused the infection and caused the child to be as sick as they are." |

CAUTI, catheter-associated urinary tract infection; CLABSI, central line−associated blood stream infection; CNS, clinical nurse specialist; HAC, hospital acquired condition; K cards, Kamishibai cards.

during the development stage (creating materials, marketing, and roll-out), but the ongoing use of K cards is an easy, quick, and nonthreatening way to facilitate and sustain evidence-based practices. K cards are cues to action for all unit staff—and even for patients and family members who see the K card whiteboard—which reflects unit adherence to evidence-based bundles.

A recent systematic review identified 62 publications related to sustainability approaches in healthcare, with most publications appearing within the last 4 years. Only 37% of these publications were specific to healthcare; most were specific to community and public health settings.[36] This systematic review did not include any studies related to the prevention of HAIs. Despite initial research in sustaining evidence-based practices, there appears to be a lack of research focused on taking this 1 step further—to providing practical tools for frontline staff and leaders.[37] However, we acknowledge a recent publication that, although related to tobacco control, begins to take the next steps in exploring sustainment by developing, testing, and disseminating training programs that maintain evidence-based practices.[38]

Compliance data from this unit indicate K cards have the potential to be used as tools for sustaining evidence-based practices. Sustaining quality improvement efforts is challenging, but the current literature offers 2 solutions: thoughtful planning and the use of approaches that match the setting or context.[36] The 2 nurse leaders in this study developed their own version of K cards (both the process and materials used) as a tool to keep evidence-based bundles alive and well at the unit level. They carefully planned the implementation process to match their unit climate, including roll-out, educational tools (whiteboard and K card design), and communication approaches that facilitated the process.

It was clear from our interviews that K cards were used, in this case, to promote honest and clear lines of communication about the evidence-based bundles, providing a level of psychological safety that made staff feel comfortable bringing up problems and discussing solutions with their manager in real time. There was initial hesitation among staff about K cards. However, it quickly became apparent that K cards enhanced a unit-level learning climate and kept the evidence-based bundles related to CAUTI and CLABSI fresh in the minds of all unit staff. The success of this model has led to an expansion of the initiative to all units of this midwestern children's hospital, with replication efforts currently under way. The nurse leaders on the unit described in this case study have been asked by hospital leaders to assist in the replication process across all pediatric units.

We recognize a major limitation to this study is that this was 1 pediatric unit, and we did not compare this unit with any other unit. Although we had a relatively small sample of interview participants, we determined the sample to be representative because of the

**Table 3**
Nurse leader perspectives

| Perceived benefits | Participant quotes (2 interviews from 1 unit) |
| --- | --- |
| **K cards as communication tool** | |
| Facilitate positive interactions between leaders and staff | "K cards enable us as managers to go out on to the unit and have face-to-face conversations with our staff, whether it be one-on-one conversations or a group conversation about a particular topic that we decided to place on the K card. So instead of managing by e-mail or managing by some type of paper notification in the breakroom, we actually go out on to the unit. And the K cards create the conversation about whatever it is we're trying to have a conversation about." |
| | "For me, the benefits of K cards are being able to have in-the-moment conversations with frontline staff. I think it breaks down that barrier [so that] I can have a conversation where they don't have to be afraid of me because I am their boss." |
| Serve as reminders of bundle components and reinforce existing education | "K cards enable us to question our staff about a particular practice. And it tests their knowledge on it. And it lets us give them feedback on whether or not their base knowledge is accurate or what other things they can think about." |
| | "We were not consistently irrigating the Foleys in the same way, so we have created a job instruction sheet so staff can consistently irrigate the Foley in the same way. And we've incorporated that into the K card. So, when we have to do it, the staff are at least aware that we have a job instruction sheet and where to find it, and they can follow that process all of the time." |
| Facilitate "problem-solving" for bundle implementation with staff | "Typically, when we do a K card, our goal is to always just speak with one nurse or maybe two nurses. But what ends up happening is people come over and join in the conversation. And it ends up being like a mini staff meeting taking place on a unit, which is even better. Because then dialogue is taking place between nurse colleagues on the unit, and different levels of experience are brought out. They start to compare how each other practices nursing on the unit based on whatever the topic is for the K card. It makes my job extremely easy, because my employees that are in the trenches are the ones that are actually having the conversation." |
| | "I've actually learned so many things from the K cards. Like what are those challenges that I can then take back to my leadership team on things we can fix, if it's in our electronic medical record, or supplies—things that I'm able to take immediate action on." |
| **K card implementation process** | |
| Are flexible and can be adapted to rapid changes in policy, EMR, and documentation | "You go, and you ask the question and you realize the staff don't actually understand what you're asking them. So, we can simply go back and edit the way that we're asking the question. Maybe we got our information incorrect. Perhaps there was a new policy change that actually forces us to change the K card. We can always go back and just edit and then create new K cards so that they are more up-to-date." |
| Must be altered at regular intervals to maintain staff interest | "If I go out on the unit with a K card that I've been out on the unit with multiple times, the interest really dies out . . . keeping the information fresh is very important. If you try to beat something over and over, the interest is just gone. And then it's not really a conversation anymore." |
| | "We did change our K cards about a year in because we noticed the staff knew the answers before we were even asking them. So, we added some different questions to the CLABSI K card. And it was fascinating because when we started doing them, the nurses [noticed]. We learned we had to edit them so that we didn't get bored with them, and the nurses didn't get bored with them." |
| Explaining and demonstrating value to staff are critical | "Educating the staff on what a K card is is important. Where does it come from, what's its history, and what's the point behind it? Why are we doing this and how is it adding value? Is it adding value by having conversations on the unit, which means we're having less staff meeting time where we're asking you to come in, or we're asking you to leave the bedside to sit for an hour in a meeting? Giving them the benefits. And once I think staff understand it, doing a small test of change and just trying it to show the staff how it is really just a conversation, I think then [it] becomes very easy to implement." |
| Leaders must be respectful of staff time and availability | "I've really tried to not force it on them or make it seem like a burden. I don't want to do it when I can sense they're busy because I don't want it to be a negative thing. So, I really have tried to be very mindful of their workload. I always try to ask if they have time beforehand. If there's a couple people at the desk, I'll just ask who has time or who has five minutes to do a K card with me. And that, I think, has worked out well because now I'll always have a couple of people say, 'I have time,' which it's really nice to have two or three people say that." |
| Multiple ways to track "success" | "We do audits of the K card. So, if I were to go on the unit right now and grab an employee and walk through a K card with them, I would check the audit to say, 'Did the nurse understand basic information?' It enables me to go through the audit and see [if] my objectives were met by meeting with the employee. And if they weren't met, what was something different that I could've done to either [sic] steer the conversation in a different direction? Or maybe I need to change the K card. Or maybe that nurse just needs more education on the specific topic that we were talking about." |
| | "I'll often do audits on CLABSI and CAUTI. And then oftentimes I'll organically weave [the K card] in when I'm talking to the nurse. And I'm already talking about exactly the same things that are on the K card, so I'll often [say], 'Since we're already talking about this, do you want to just do the K card?'" |
| **K card leadership factors** | |
| Positive facilitation by leaders is crucial to success | "But I think attempting to replicate it we've struggled with because I think the personality and approach [we] have [are what have] made us successful. No matter what, even if there's a deficit, or a bundle element isn't being followed, you're still happy and perky." |
| | "I think there's so much value [in] the staff seeing that both the manager and the clinical nurse specialists know what they're doing. But I think the managers, just by their role, they're not at the bedside as often. And when I'm in meetings, I can speak better to why we need certain resources because I know what the nurses have to do to keep patients safe." |
| Implementation consistency relies on leaders | "We get bogged down in a lot of other things, and so it really becomes dependent upon us to make sure that we are making time to do the K card. Otherwise, it's very easy to just forget about [it] so that you can work on all the other things that you're trying to work on." |
| | "I think the only drawback or challenge is just trying to find the right time to do it, between my schedule, which is smattered with meetings, and trying to be on the unit, and just trying to find the right time for the nurses—and if I'm noticing they're having downtime at the desk, just trying to sneak in and do it." |

*CAUTI*, catheter-associated urinary tract infection; *CLABSI*, central line−associated blood stream infection; *EMR*, electronic medical record; *K cards*, Kamishibai cards.

variation in interview shift times and theme saturation. Given this is a nonexperimental study, we cannot make a causal link between the use of K cards and CAUTI and CLABSI rates. However, we have used compliance rates as an indicator of intermediate success. We were unable to rule out other contextual factors that may influence infection rates. The apparent implementation success of K cards on this unit has led to replication plans—an indication that this model has been accepted by hospital leadership and can be modified and adapted for different units and patient populations. This model has also been successfully (as far as acceptability by both leaders and staff) replicated in an adult unit of an affiliated hospital.

We recognize that the HBM, although sufficient for this limited investigation, may not be the optimal model when exploring K card implementation on a larger scale. Future research related to the use of tools such as K cards would benefit from models that capture the complexity of implementation with context specific constructs such as Promoting Action on Research Implementation in Health Services or the Consolidated Framework for Implementation Research.[39]

We also acknowledge that the type of leadership demonstrated on this unit may have influenced the acceptability of K cards. Both leaders were approachable and appeared to engage easily with frontline staff. Literature indicates the importance of and the interplay between leadership, psychological safety, and sustained best practices.[40,41] A recent mixed methods study explored how leadership and organizational climate interface with the sustainment of evidence-based practices.[42] This study concluded that a sustainment leadership scale can be used to focus attention on how leaders can best facilitate this goal. Future research should include examination of whether the acceptability of this type of intervention is dependent on who is leading the K card conversation. The replication process at this facility will lend itself to answering this question. Discovering "acceptable" leaders for K cards would benefit hospitals that may want to interchange K card leaders, such as using infection preventionists and quality improvement staff as leads. Infection preventionists can take an active role in the implementation of K cards by assisting with evidence-based bundles and attending K card interactions to uncover barriers that frontline staff experience when incorporating bundles into their routine care.

The strength of this study lies in the potential practical application of our findings. The intent of this study was to highlight the use of K cards to promote and sustain best practices for preventing HAIs and to provide a tool and guidance for unit-level leaders who want to use K cards. As replication is now under way in 4 additional units within the institution, there is opportunity to further explore the acceptability of K cards in other patient populations and to fully understand what it takes to replicate something that is working on 1 unit in other units. It is also an opportunity to discover how key leadership factors (communication and leadership style) influence the uptake and acceptability of K cards.

## CONCLUSIONS

Our study presents evidence of a relatively easy and time-efficient method (K cards) of facilitating and sustaining best practices in infection control. Research has shown that when evidence-based practices, such as bundles, are employed with high fidelity, HAIs are largely preventable. However, sustaining these practices is difficult in the context of a hospital setting. Key themes indicate that unit leaders play a crucial facilitation role in the implementation of K cards by fostering psychological safety and creating a learning climate among frontline staff. The positive and flexible nature of K cards, as well as the minimal time required for interaction, also appeared to positively influence staff perceptions. K cards can become a real-time cue to action—for both staff and nurse leaders—to engage in the ongoing efforts to sustain best practices for reducing HAIs, leading to better and safer patient care.

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