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Brief Report: Introducing a Catheter-Associated Urinary Tract Infection Prevention “Guide to Patient Safety” (GPS)

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Abstract

Catheter-associated urinary tract infection (CAUTI), one of the hospital-acquired conditions targeted for reduction by the U.S. government, is challenging to prevent. We therefore developed a self-assessment tool (CAUTI “Guide to Patient Safety”) based on extensive qualitative evaluations. We describe the rationale, features, and utility of such a quality improvement tool.

“[T]he hospital- [is] the most complex human organization ever devised”

- **Peter Drucker**

Nearly 2 million Americans develop a healthcare-associated infection (HAI) each year.¹ Catheter-associated urinary tract infection (CAUTI) accounts for about one-third of all HAIs, making it one of the most common infections in the world.² The annual cost of CAUTI in the United States is about \$350 million.³ Given that CAUTI is reasonably preventable through the adoption and implementation of evidence-based methods, the potential savings -- in terms of both lives and dollars -- are sizeable.⁴

We have previously reported that a state-wide multimodal intervention rolled out by the Michigan Health & Hospital Association's (MHA) Keystone Center appeared to decrease urinary catheter use, a key strategy for preventing CAUTI, by approximately 30% among

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Potential Conflicts of Interest. Dr. Saint has received numerous honoraria and speaking fees from academic medical centers, hospitals, specialty societies, state-based hospital associations and non-profit foundations (e.g., Michigan Health and Hospital Association, Institute for Healthcare Improvement) for lectures about catheter-associated urinary tract infection. No other potential conflict of interest is noted.

participating Michigan hospitals.⁵ These rates were significantly lower than hospitals in the rest of the U.S.⁶

To better understand why some hospitals are more successful than others in reducing CAUTIs, as well as identify key elements that promote or impede CAUTI prevention activities, we have used qualitative methods in conjunction with our quantitative evaluation. Because CAUTI prevention includes both technical and adaptive components,⁷ qualitative evaluation – site visits in particular – is especially informative and often necessary to fully understand hospital-specific challenges and thus make recommendations for improvement.⁸ The time and resources necessary for site visits, however, is considerable. Additionally, conducting site visits to each of the over 5,000 hospitals in the United States is not feasible. To overcome this barrier, we have created a CAUTI-specific “Guide to Patient Safety” (GPS) to help individual hospitals conduct their own evaluations and identify potential challenges and strategies for improvement. The CAUTI GPS consists of a brief assessment process followed by feedback, including possible solutions to specific issues, based on lessons we have learned from other hospitals. In this paper we describe the CAUTI GPS, its development, and our plans for further enhancing and disseminating the tool. While validation is necessary, we believe the CAUTI GPS will allow sites to self-diagnose problems and institute solutions as necessary.

The CAUTI GPS

Over the past decade our multi-disciplinary research team has received funding support from several federal agencies to understand why some hospitals are more successful than others in preventing device-associated infection. This work includes conducting qualitative assessments in a total of 43 hospitals across the U.S. (22 were evaluated through phone interviews only while 21 were visited in person). We have conducted more than 400 interviews of personnel at various levels within the organizations, from chief executive officers to front-line nurses and physicians.

Conducting formal visits, while useful, is both time-consuming and resource-intensive. Each visit requires one to two days of meetings with key personnel, travel funds, and in some cases interview transcription and preparation of a site report with guidance on how to overcome identified barriers. As we conducted more interviews, we found that a handful of critical issues seemed to arise irrespective of a hospital's location or size. While some were technical issues (collecting data and assessing catheter necessity), many were related to common barriers to effective CAUTI prevention (e.g., lack of a physician champion, nursing resistance).

While the feedback from the site visits and interviews were considered valuable by the hospitals, this approach is not feasible across the U.S. or for hospitals in different parts of the world. We thus began work on a self-administered list of questions that could be completed by key informants to help guide their hospital's approach to CAUTI prevention. We developed the GPS initially for hospitals that have already initiated some CAUTI prevention activities, but have fallen short of their desired success. Having begun the

implementation process, they are more likely to be aware of the challenges at their site. The GPS self-diagnosis questions are shown in Table 1.

To pilot test the GPS, we have asked key hospital personnel to complete a printed version of the questions. We then reviewed the results and both discussed and suggested certain approaches that may help to overcome the identified challenges (Table 1). The overall response to the GPS has been positive. For example, one center found it useful in identifying key barriers and, based on the results of the GPS, addressed one of their obstacles to achieve some preliminary success. Specifically, this hospital found that they lacked an effective nurse champion (question #3) and decided to “work around” the current nurse champion by engaging directly with frontline nurses. Additionally, based on initial feedback from several sites we have modified the GPS by adding one question, deleting another question, and clarifying a third question. We envision that eventually the GPS will be entirely web-based and that the guidance will be automated based on the answers to the assessment questions.

Specifically, the GPS will be interactive such that after answering the “Yes/No” questions, the system will analyze the responses and provide the user with personalized feedback. For example, if the user has answered that they lack a well-functioning team despite having a dedicated project-manager, they will be provided with links to aid in the creation (or improvement) of their CAUTI prevention team. Knowing that units have differing resources and processes in place, the feedback will include multiple suggestions about team roles and responsibilities as well as ways to address team-building and communication. For the user who feels that they already have an effective physician champion, the tailored feedback will focus on sustaining this aspect of the hospital's initiative while providing other recommendations for facilitating implementation. While currently targeted for sites that have already initiated a CAUTI prevention program, we also plan to create an automated GPS for those units that are at the beginning of their journey. This will be a more directive roadmap with a variety of routes to the end destination of reducing CAUTI.

Conclusions

CAUTI prevention is an ideal model for developing an implementation self-assessment tool. Unlike other device-related complications, which disproportionately affect the critically ill, CAUTI can affect any hospitalized patient. Another distinguishing feature of CAUTI is the lack of a straightforward technical solution for prevention – unlike the use of chlorhexidine as site disinfectant to prevent central line-associated bloodstream infection. CAUTI prevention is heavily reliant upon adaptive interventions such as behavior change. CAUTI is thus quite representative of patient safety problems such as falls or pressure ulcers. Effective implementation often requires a deep understanding of the barriers to the use of evidence-based practices in a particular hospital, an exercise that qualitative assessment can help address. The main drawback of this approach is that it is resource-intensive. We thus developed a tool that can be broadly used without the need for a costly external evaluation. The key principles of developing the CAUTI GPS were that it had to be both concise and actionable in helping a hospital identify the most salient problems they are facing.

While a potentially valuable advance, the CAUTI GPS requires formal validation, which we have begun in several hospitals. Additionally, the CAUTI GPS will need to be modified for use with hospitals that have not yet begun prevention activities.

Limitations notwithstanding, it would be reasonable for sites that are facing challenges with their CAUTI prevention work to use the assessment tool as it may help to identify key issues or inform a more focused improvement effort as needed to reduce CAUTI rates.

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Table 1Catheter-Associated Urinary Tract Infection Prevention “Guide to Patient Safety” (GPS) with Pilot Results^{*}

Question		Yes	No
1.	Do you currently have a well-functioning team (or work group) focusing on CAUTI prevention?	67%	33%
2.	Do you have a dedicated project manager to coordinate your CAUTI prevention activities? [†]	56%	44%
3.	Do you have a committed [‡] nurse champion for your CAUTI prevention activities?	68%	32%
4.	Do bedside nurses assess, at least daily, whether their catheterized patients still need a urinary catheter?	68%	32%
5.	Do bedside nurses take initiative to ensure the indwelling urinary catheter is removed when the catheter is no longer needed (e.g., by contacting the physician or removing the catheter per protocol)?	76%	24%
6.	Do you have a committed [‡] physician champion for your CAUTI prevention activities?	44%	56%
7.	Have physicians fully embraced CAUTI prevention activities?	49%	51%
8.	Has senior leadership fully supported [§] CAUTI prevention activities?	87%	13%
9.	Do you currently collect CAUTI-related data (e.g., urinary catheter prevalence, urinary catheter appropriateness) in the unit(s) in which you are intervening?	82%	18%
10.	Do you routinely feedback CAUTI related data to frontline staff (e.g. urinary catheter prevalence, urinary catheter appropriateness, and infection rates)? [¶]	48%	52%
11.	Have you experienced any of the following barriers?		
	A. Substantial nursing resistance	43%	57%
	B. Substantial physician resistance	46%	54%
	C. Patient and family requests for an indwelling urinary catheter	28%	72%
	D. Excessive burden of collecting data	43%	57%
	E. Indwelling urinary catheters commonly being inserted in the emergency department without an appropriate indication	67%	33%

^{*} The GPS was administered to 64 people at six different sites.

[†] This question has since been changed to: Do you have a project manager with dedicated time to coordinate your CAUTI prevention activities?“

[‡] Committed was later changed to effective.

[§] Fully supportive was later changed to supportive.

[¶] This question was added to the GPS and administered to 24 people at one site.

^{||} This question was administered to 40 people at five sites and then removed from the GPS.