

## Patient Safety Tip of the Week

March 2, 2021

### Barriers to Timely Catheter Removal

CAUTI's (catheter-associated urinary tract infections) and CLABSI's (central line-associated bloodstream infections) remain serious hospital-acquired infections (HAI's). The best way to avoid them is to avoid the use of urinary or vascular catheters in the first place. Fortunately, there are good guidelines for determining the appropriateness of such catheters. But, obviously, some are needed. The next most important facet of preventing CAUTI's and CLABSI's is removal of the catheters as soon as they are no longer needed.

Urinary catheters are the leading cause of hospital-acquired urinary tract infections (see our many prior columns listed below). And urinary catheters are associated with many non-infectious complications and adverse effects, including GU trauma, reduced mobility (the “one-point restraint”), falls, and delirium.

While we will use the term “intravascular catheters” in this column, we are talking about central venous catheters and PICC lines. Our prior columns on such lines (listed below) also note there are other potential complications from these catheters besides CLABSI's.

The University of Michigan has been at the forefront of the campaign to eliminate CAUTI's and CLABSI's. They previously reported on many of the barriers to successful CAUTI prevention (see our June 2013 What's New in the Patient Safety World column [“Barriers to CAUTI Prevention”](#)).

Despite all these efforts, we continue to see infections related to such catheters. The Michigan team also led a multi-state quality improvement initiative aimed at reducing CAUTI's and CLABSI's in ICU's having high rates of such infections ([Meddings 2020](#)). But that initiative yielded no statistically significant reduction in CLABSI, CAUTI or catheter utilization in the first two of six planned cohorts.

So, the University of Michigan group did observations and in-person interviews with clinicians working on a progressive care unit of a large hospital in attempt to identify barriers to timely catheter removal ([Quinn 2021](#)). The researchers found five distinct themes related to the organizational culture of catheter removal:

1. Catheter data are hard to find, not accurate, or not available
2. Catheter removal is not a priority

3. Confusion exists about who has the authority to remove catheters
4. There is a lack of agreement on, and awareness of, standard protocols and indications for removal
5. Communication barriers create challenges

The EHR should play a critical role, but it often does not. The researchers found that information on catheters, such as catheter presence, when it was inserted, and the medical indication for it, was hard to find and often not accurate in the EHR. We have always recommended that order entry screens for catheter insertion include a **field for indication** (listing appropriate indications in a checkbox format). There should be a **flag** set on every patient having a catheter in place. That way, a nurse or physician can see a daily listing of which patients have catheters in place. Moreover, clinical decision support systems can alert clinicians to reassess the need for continued catheter use on a daily basis. The real problem arises when someone simply takes a Foley catheter kit or intravascular catheter kit to the bedside and no CPOE order is created for that catheter. We've done multiple columns highlighting that often a clinician is "surprised" to find his/her patient has an indwelling catheter (see our May 8, 2007 Tip of the Week "[Doctor, when do I get this red rubber hose removed?](#)", and our What's New in the Patient Safety World columns for December 2014 "[Surprise Central Lines](#)" and July 2016 "[Holy Moly, My Patient has a FOLEY!](#)"). Such catheters are often inserted at night by covering physicians, not recorded in the EHR, and poorly communicated with the daytime clinician team. And we often don't notice the patient has a catheter because it may be obscured by blankets or gowns. We think the solution there lies in use of **barcoding** to tie the catheter to a specific patient. Such barcoding could tie to the MAR (medication administration record) as a means of interfacing with the EHR and require that an indication be input. Note that we have previously also suggested that every catheter kit have a checklist that must be filled out before use and one of the items on that checklist would be indication. However, unless the MAR is clearly linked to the EHR and CPOE system, someone would still have to manually input the data from that checklist into the EHR if the EHR is to be utilized for tracking catheter use and generating alerts.

Quinn et al. found that catheter data in the EHR were not readily available during morning rounds because these physician teams did not typically round with laptops or tablets. It's easy enough to get a printout of all patients belonging to an individual clinician or service who have a catheter in place. That paper printout can be taken on rounds when the rounding team is not using laptops or tablets. Our own experience is that nurses are much more reliable than physicians in paying attention to catheter use. Hopefully, the rounding team includes a head nurse or other nurse who could have the printout.

The second theme, that catheter removal is not a priority, is perhaps the most important barrier. The researchers found that both physicians and nurses are very busy attending to multiple medical problems in multiple patients and often attention to catheters falls to the bottom of their list of priorities. The second part of that theme, however, is much more problematic. That is the observation that sometimes nurses may like having either a urinary or intravascular catheter in place for convenience. Convenience, of course, is not

a legitimate indication for continued catheter use (except possibly in a patient receiving only end-of-life care). Ideally, any CDSS-generated alert asking about continued catheter use should require input of the indication for continued use.

The third theme was confusion exists about who has the authority to remove catheters. The hospital did have a policy in place that allowed nursing staff to remove urinary catheters without a physician order if certain criteria were met. However, in practice, many physicians were unaware of the policy and many nurses were reluctant to remove the catheters without a physician order.

Theme 4 was lack of agreement on, and awareness of, standard protocols and indications for removal of catheters. While organizations may have clearly stated criteria for insertion of urinary or intravascular catheters, few specifically delineate criteria for discontinuation or removal of them. Quite frankly, we think they should be the same for initial insertion and continuation, so each day the clinical team should be asking whether the criteria continue to be met.

Theme 5 should surprise no one: communication barriers create challenges. The researchers found that physicians seldom spoke to each other about catheters and communication between physicians and nurses was particularly poor. While we mentioned above that we expect the rounding team would have a designated nurse participating, that was often not practical because of large nursing workloads or timing of the rounds (rounds often being done while nursing change of shift was occurring). The Michigan group previously reported on a more detailed examination of communication barriers between physicians and nurses about appropriate catheter use ([Manojlovich 2019](#)).

Quinn et al. note that implementation of improvement efforts such as EHR reminders and stop orders, nurse empowerment policies, and standardized protocols have become more common. But they note one substantial unmet need: there is a current lack of system for displaying information about catheters **at the bedside** in a readily visible format. Such display should indicate the presence of a catheter, duration of use, and indication. Such a system should prompt discussion about its continued necessity, help facilitate removal, and prompt recognition and correction of any incorrect catheter data in the EHR.

This is yet another valuable contribution from the University of Michigan researchers on ways to prevent CAUTI's and CLABSI's (and other adverse consequences of catheters).

#### **Our other columns on urinary catheter-associated UTI's:**

- May 8, 2007 Tip of the Week "[Doctor, when do I get this red rubber hose removed?](#)"
- January 8, 2008 Tip of the Week "[Urinary Catheter-Associated Infections](#)"
- April 2008 What's New in the Patient Safety World column "[More on Nosocomial UTI's](#)"

- June 24, 2008 Tip of the Week “[Urinary Catheter-Related UTI’s: Bladder Bundles](#)”
- April 21, 2009 Tip of the Week “[Still Futzng with Foleys?](#)”
- June 9, 2009 Tip of the Week “[CDC Update to the Guideline for Prevention of CAUTI](#)”
- March 2010 “[IDSA CAUTI Guidelines](#)”
- February 2011 What’s New in the Patient Safety World column “[Catheters Not Needed in C-Sections?](#)”
- January 2012 “[CAUTI’s Still Get No Respect](#)”
- May 2012 “[Foley Catheter Hazards](#)”
- November 2012 “[CAUTI Conundrum](#)”
- December 18, 2012 “[Unintended Consequences of the CAUTI Measure?](#)”
- January 2013 “[Silver-Coated Urinary Catheters Don’t Reduce CAUTI’s](#)”
- June 2013 “[Barriers to CAUTI Prevention](#)”
- November 2013 “[Further Reducing Urinary Catheter Use](#)”
- June 2014 “[Updated HAI Prevention Guidelines from SHEA/IDSA](#)”
- June 30, 2015 “[What Are Appropriate Indications for Urinary Catheters?](#)”
- December 2015 “[CAUTI Prevention Tools](#)”
- July 2016 “[Holy Moly, My Patient has a FOLEY!](#)”
- December 2016 “[The Joint Commission NPSG for CAUTI’s](#)”
- April 3, 2018 “[Cost of a CAUTI](#)”
- September 25, 2018 “[Foley Follies](#)”
- April 30, 2019 “[Reducing Unnecessary Urine Cultures](#)”

**Some of our other columns on IV access, central venous catheters and PICC lines:**

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|-------------------|--|
| January 21, 2014  | “ <a href="#">The PICC Myth</a> ”  |
| December 2014     | “ <a href="#">Surprise Central Lines</a> ”                                   |
| July 2015         | “ <a href="#">Reducing Central Venous Catheter Use</a> ”                     |
| October 2015      | “ <a href="#">Michigan Appropriateness Guide for Intravenous Catheters</a> ” |
| March 27, 2018    | “ <a href="#">PICC Use Persists</a> ”  |
| February 26, 2019 | “ <a href="#">Vascular Access Device Dislodgements</a> ”                     |
| July 16, 2019     | “ <a href="#">Avoiding PICC’s in CKD</a> ”                                   |

**References:**

Meddings J, Greene MT, Ratz D, et al. Multistate programme to reduce catheter-associated infections in intensive care units with elevated infection rates. *BMJ Quality & Safety* 2020; 29: 418-429  
<https://qualitysafety.bmj.com/content/29/5/418>

Quinn M, Ameling JM, Forman J, et al. Persistent Barriers to Timely Catheter Removal Identified from Clinical Observations and Interviews. The Joint Commission Journal on Quality and Patient Safety 2021;46(2): 99-108

<https://www.sciencedirect.com/science/article/pii/S1553725019304210>

Manojlovich M, Ameling JM, Forman J, et al. Contextual Barriers to Communication Between Physicians and Nurses About Appropriate Catheter Use. Am J Crit Care 2019; 28(4): 290-298

<http://ajcc.aacnjournals.org/content/28/4/290.abstract>



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