J Nurs Care Qual
Vol. 32, No. 3, pp. 202–206

Quality From the Field

This column provides a forum for clinicians to describe their use of evidence to change practice and improve quality of care.

Standardizing Practice for Intermittent Irrigation of Indwelling Urinary Catheters

CE 1.0 Contact Hours

Jessica Weber, MS, RN, ACNS-BC, CCTN;
Suzanne Purvis, DNP, RN, GCNS-BC;
Shelly VanDenBergh, MS, RN, GCNS-BC;
Linda M. Stevens, DNP, RN-BC, CPHQ, CSPHP

MAINTAINING a closed system to reduce catheter-associated urinary tract infections (CAUTIs) is recommended in a number of practice guidelines including the Centers for Disease Control and Prevention's *Guideline for Prevention of Catheter-Associated Urinary Tract Infections 2009*.[1] The CAUTI Prevention Workgroup at this Midwest academic medical center routinely ensures that all clinicians are following best practices for maintaining urinary catheters. Inpatient and procedure areas at the organization have CAUTI prevention champions who receive routine education on CAUTI prevention and are accountable for spreading change in the areas in which they practice. Anecdotal evidence collected from the champions supported an inconsistent practice of intermittent irrigation of indwelling urinary catheters (IUCs). In 2015, 3 of the 28 CAUTIs at our institution involved IUCs that were irrigated intermittently. A subcommittee was formed to (1) determine current practices, (2) research best practices, and (3) propose recommended practices concerning intermittent irrigation of IUCs.

Author Affiliations: *Division of Surgical and Psychiatric Nursing (Ms Weber), Nursing Practice Innovation (Dr Purvis), Division of Medical Nursing (Ms VanDenBergh), and Nursing & Patient Care Services (Dr Stevens), University Hospital - UW Health, Madison.*

The authors have no disclosures or conflicts of interest.

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.jncqjournal.com).

Correspondence: *Jessica Weber, MS, RN, ACNS-BC, CCTN, Division of Surgical and Psychiatric Nursing, University Hospital - UW Health, 600 Highland Ave-B4/681, Madison, WI 53792 (jweber3@uwhealth.org).*

Accepted for publication: July 29, 2016
Published ahead of print: September 8, 2016

DOI: 10.1097/NCQ.0000000000000228

BACKGROUND

The literature indicates that IUCs should only be irrigated if there is evidence of a blood clot. Blood clots may be present after bladder, kidney, or prostate surgery, or with encrustation of long-term catheters.[2-4] Routine intermittent irrigation of an IUC, especially if the IUC is disconnected from the drainage bag, is

thought to increase the possibility of introducing microorganisms into the bladder, resulting in an infection. According to experts, even if biofilm (bacterial colonies) are suspected to have caused encrustation on the IUC sides, and are causing blockage, routine irrigation is not effective and could even increase the risk of infection.[5] In addition, the IUC itself may be part of the problem causing the obstruction and should then be replaced rather than irrigated.[1]

Other than changes to the size of IUCs and the introduction of routine catheter care, there have been few changes to IUCs over the years.[6,7] Securing the catheter to the bag, and thus preventing an opening into the closed system, has been one change that has been thought to prevent CAUTIs. Several practice guidelines on urinary catheters emphasize the importance of maintaining a closed system.[1,3,8]

To maintain a closed urinary system when irrigating, it has become a widely accepted practice in many hospitals to use the sampling port, rather than disconnecting the IUCs from the drainage bag. Since the sampling port was designed for obtaining a specimen and not for irrigation, most likely it would not be effective in removing the catheter blockage and is not a recommended routine practice. Other methods for intermittent irrigation of an IUC are using a 3-way catheter and disconnecting the tubing, which require good technique to avoid allowing organisms to enter the catheter. It is notable that some nursing textbooks state that the closed system should be maintained and intermittent irrigation might sometimes be necessary.[9,10] These textbooks include descriptions of intermittent irrigation of IUCs through the specimen port as an option for manual irrigation.[9,10]

A literature search was completed in PubMed using the following search terms: urinary catheter management, irrigation of urinary catheters, catheter-associated urinary tract infections, and indwelling catheters. Practice guidelines on CAUTI were also reviewed in the National Guideline Clearinghouse, as well as a sample of recent nursing and urology textbooks that included sections on IUC management. A table of evidence was assembled from this literature to help determine the best practice in the area of intermittent irrigation of IUCs.

A subcommittee, consisting of 4 clinical nurse specialists (CNSs) and a direct care registered nurse (RN) CAUTI champion, was formed to focus on intermittent irrigation processes. After a comprehensive review of the literature, it was determined that a survey should be developed to fully understand the intermittent irrigation practices throughout the institution. Using the literature as a guide, the survey was developed and submitted to the institution's Nursing Research Council for review and approval. The purpose of the survey was to further describe the varying nursing practices of intermittent irrigation.

METHODS

The short 6-question survey focused on indications for irrigation, the method of irrigation, and ordering and documenting the irrigation. It was sent to all inpatient unit, emergency department, and float pool RNs at the institution via e-mail as an electronic survey link. Flyers were hung on units, reminder e-mails were sent, and unit-based CNSs encouraged staff to complete the survey.

RESULTS

Survey results

The survey was sent to 1171 RNs, and 414 completed the survey, for a response rate of 35%; however, not every respondent answered every question. First, the nurses were asked to indicate their practice area. That information was collected to determine whether there were any unit-specific trends where education would need to be focused in the future. The other survey questions and results follow. For all questions, nurses were able to select multiple responses that applied, so percentages did not add up to 100%.

The survey assessed why intermittent irrigation was being ordered. In the survey, 62% of nurses (n = 254) stated they irrigate for blood clots. However, 35% (n = 143) also irrigated for low urine output, which has not been found in literature as an approved indication for intermittent irrigation. Survey question comments included themes of irrigation with physician order only and for low urine output (sometimes with a large bladder scan volume), and that some nurses do not irrigate IUCs.

More than half of the respondents in this survey (n = 160; 57%) indicated they disconnect the catheter from the urine collection bag and use a piston syringe to irrigate the IUC. Yet, just under half of the respondents (n = 120; 43%) also used the specimen side port to irrigate the IUC. Another 35% (n = 99) intermittently irrigated only when a 3-way IUC was in place. Almost all respondents (n = 277; 98%) stated that nurses intermittently irrigated IUCs. Urology providers (physicians and advanced practice providers [APPs]) do the irrigations according to 62% of respondents (n = 175), whereas other physicians (29%; n = 83) or APPs (16%; n = 45) are responsible for IUC irrigations.

Irrigation of an IUC should be ordered in the electronic medical record (EMR). At the time of the survey, there was no specific order in the EMR for intermittent irrigation of an IUC. The order was embedded as part of the "Insert and Maintain Indwelling Urinary Catheter" order (see Supplemental Digital Content, Figure 1, available at: http://links.lww.com/JNCQ/A297). Slightly less than half of the respondents (n = 126; 45%) received the order that way. Other nurses (n = 147; 52%) received a Nursing Communication order in the EMR as the order for intermittent irrigation. This is a nonspecific order where a provider can enter any free-text information. Since this is a free-text order, there are inconsistencies in exactly what is ordered.

Approximately 80% of survey respondents (n = 227) document intermittent irrigation, including irrigation fluid and total output, in the flow sheet in the EMR. Unfortunately, about 13% (n = 36) document it in a progress note and 4% (n = 11) do not document intermittent irrigation at all. Inconsistent documentation creates confusion about whether an IUC was ever irrigated and prevents tracking the results.

Creation of an order to standardize practice

The findings of the survey demonstrated the need to standardize the process for ordering and provide guidance on appropriate indications and technique for intermittent irrigation of IUCs. The variety of ordering methods prompted the subcommittee to standardize the process for communicating the need to irrigate an IUC and create an order to be placed within the EMR (see Supplemental Digital Content, Figure 2, available at: http://links.lww.com/JNCQ/A298).

This order is placed by the provider to communicate the indication, irrigant to be used, and method for irrigation. Process instructions inform health care providers that irrigating through the IUC sampling port and irrigating IUCs for low urine output are not recommended. The ordering provider specifies the indication for irrigation, either suspected blood clot or bladder scan of greater than 250 mL with an IUC in place. The irrigant type (normal saline, sterile water, or other) and volume (up to 60 mL) are selected by the ordering provider. Finally, the provider indicates the method to be used for irrigation, either disconnect the catheter from the tubing and use the piston syringe or through the 3-way IUC. This order is intended only to be used for *intermittent* irrigation of IUCs. A separate order is for *continuous* bladder irrigation. The section in the "Insert and Maintain Indwelling Urinary Catheter" order that had previously included the irrigant and frequency of irrigation was then removed.

Order approval and implementation process

Feedback and approval on the proposed practice standard for intermittent irrigation of an IUC were obtained by multiple groups in

the organization. The Nursing Practice Council and Nursing Documentation Committee, part of the shared governance structure of the organization, provided feedback, as did the larger CAUTI Prevention Workgroup.

Nursing Informatics and Information Services Department staff assisted with creating the irrigation order. To ensure all order sets that included intermittent irrigation of IUCs were discovered, the Center for Clinical Knowledge Management Department, responsible for building order sets, was consulted. With its assistance, each order set containing an intermittent irrigation of IUC was replaced with the newly created order.

The availability of the new order was communicated by an e-mail from the chief medical officer to all inpatient physicians and APPs and from the chief nursing officer to all RNs. In addition, all medical and nursing staff members were notified of the availability of the order via the newsletter published biweekly announcing changes impacting the EMR. Nurse CAUTI champions were empowered to roll out the new IUC irrigation order on their units. Synonyms were added to the EMR to more easily locate the order, and the order was included in appropriate order sets.

DISCUSSION

The survey conducted on intermittent irrigation of IUCs confirmed inconsistent practices based on previous discussions with CAUTI champions. Results identified the need for standardizing this practice, which had not been done before at this institution. Creation of a standard order was the ideal way to begin. The inconsistent communication in the ordering process for intermittent irrigation potentially leads to unnecessary irrigation of IUCs. If IUCs are being disconnected for intermittent irrigation without an appropriate indication, it may lead to an increase in CAUTIs. With the new intermittent irrigation order, there is clear communication regarding when and how to irrigate the IUC, which should decrease inappropriate irrigations and ideally fewer CAUTIs. With the ordering process consistent, the RN, as the end user irrigating the IUC, is more likely to be informed about the standardized irrigation practice. In addition, the intermittent irrigation order provides the opportunity to electronically track the use of the order and frequency of irrigation.

In a large academic institution, it can be challenging to reach more than 1000 RNs and providers when implementing changes to order entry and practice. The use of the "Intermittent Manual Urinary Catheter Irrigation" order will allow the subcommittee to track how the order is used and by which service and unit type through the EMR.

Limitations

One limitation of this project is that the literature on the topic of intermittent irrigation is mainly expert opinion. There were no published randomized controlled trials about intermittent irrigation or surveys of practices. Our decisions on standardized practices are based on the expert opinions noted in the literature. Another limitation is that this work has focused only on intermittent irrigation in the inpatient setting. IUCs may be irrigated for encrustation of long-term catheters as noted earlier.[2–4] This often occurs in the outpatient setting (in homes or ambulatory clinics) and was not addressed by this practice change.

CONCLUSIONS

Because of the lack of consistency with intermittent irrigation for IUCs in practice and the minimal information in the literature, this subcommittee developed a standardized practice. Steps taken to create the standard practice include gathering information from the literature and surveying staff on current practice. The practice changes were supported by implementing a standardized order including clinical decision support in the EMR. Next steps include resurveying the RNs to determine whether practice changes have been sustained and following up on the frequency of use of the standardized order.

REFERENCES

1. Gould CV, Umscheid CA, Agarwal RK, Kuntz G, Pegues DA; Healthcare Infection Control Practices Advisory Committee. Guideline for prevention of catheter-associated urinary tract infections 2009. *Infect Control Hosp Epidemiol*. 2010;31(4):319-326.
2. Willson M, Wilde M, Webb M, et al. Nursing interventions to reduce the risk of catheter-associated urinary tract infection: part 2: staff education, monitoring, and care techniques. *J Wound Ostomy Continence Nurs*. 2009;36(2):137-154.
3. Hooton TM, Bradley SF, Cardenas DD, et al. Diagnosis, prevention, and treatment of catheter-associated urinary tract infection in adults: 2009 International Clinical Practice Guidelines from the Infectious Diseases Society of America. *Clin Infect Dis*. 2010;50(5):625-663.
4. Newman DK. The indwelling urinary catheter: principles for best practice. *J Wound Ostomy Continence Nurs*. 2007;34(6):655-661.
5. Toughill E. Indwelling urinary catheters. *Am J Nurs*. 2005;105(5):35-37.
6. Jacobsen SM, Stickler DJ, Mobley HL, Shirtliff ME. Complicated catheter-associated urinary tract infections due to *Escherichia coli* and *Proteus mirabilis*. *Clin Microbiol Rev*. 2008;21(1):26-59.
7. Feneley RC, Hopley IB, Wells PN. Urinary catheters: history, current status, adverse events and research agenda. *J Med Eng Technol*. 2015;39(8):459-470.
8. Geng V, Cobussen-Boekhorst H, Farrell J, et al. *Catheterisation. Indwelling Catheters in Adults: Urethral and Suprapubic*. Arnhem, the Netherlands: European Association of Urology Nurses; 2012:112.
9. Potter PA, Perry AG, Hall A, Stockert P. *Fundamentals of Nursing*. 8th ed. St Louis, MO: Mosby Elsevier; 2013.
10. Smith-Temple J, Johnson JY. *Nurses Guide to Clinical Procedures*. 6th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2010.

For additional continuing nursing education activities on quality improvement topics, go to nursingcenter.com/ce.

Instructions:

- Read the article. The test for this CE activity can only be taken online at www.nursingcenter.com/ce/JNCQ. Tests can no longer be mailed or faxed.
- You will need to create and login to your personal CE Planner account before taking online tests. Your planner will keep track of all your Lippincott Williams & Wilkins online CE activities for you.
- There is only one correct answer for each question. A passing score for this test is 12 correct answers. If you pass, you can print your certificate of earned contact hours and access the answer key. If you fail, you have the option of taking the test again at no additional cost.
- For questions, contact Lippincott Williams & Wilkins: 1-800-787-8985.

Registration Deadline: September 30, 2019.

Discounts and Customer Service

- Send two or more tests in any nursing journal published by LWW together by mail and deduct $.95 from the price of each test.
- We also offer CE accounts for hospitals and other health care facilities on nursingcenter.com. Call 1-800-787-8985 for details.

Provider Accreditation:

Lippincott Williams & Wilkins, publisher of *Journal of Nursing Care Quality*, will award 1.0 contact hours for this continuing nursing education activity.

Lippincott Williams & Wilkins is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

This activity is also provider approved by the California Board of Registered Nursing, Provider Number CEP 11749 for 1.0 contact hours. Lippincott Williams & Wilkins is also an approved provider of continuing nursing education by the District of Columbia, Georgia, and Florida, CE Broker #50-1223. Your certificate is valid in all states.

Payment:

- The registration fee is $10.35 for CNLA members and $12.95 for nonmembers.

Disclosure Statement:

The authors and planners have disclosed no potential conflicts of interest, financial or otherwise.