CE

Is the CABIC Clean Intermittent Catheterization Patient Education Effective?

Maureen Le Danseur[1], MSN, CNS, ACNS-BC, CRRN, CCM, Sonja E. Stutzman[1], PhD, Jennifer Wilson[2], MSN, RN, CPN, Isabelle Sislak[2], BSN, & Dai Wai M. Olson[1], PhD, RN, CCRN

Abstract

Purpose: This study examined the effectiveness of the consensus model (Clinical Advisory Board for Intermittent Catheterization [CABIC] method) for teaching clean intermittent self-catheterization (ISC). The primary hypothesis was that the CABIC method of teaching ISC would result in higher ISC knowledge and performance scores.

Design: Prospective, non randomized, pre–post study of an educational intervention of ISC education with nursing students.

Methods: Nursing students completed a self-report pre-/posttest, education of the CABIC method, and video recording of the CABIC method using same-gendered manikins. The Le Danseur Instrument (LDI) was used to grade the video-recorded demonstration.

Findings: Fifty participants completed three phases of the study. Paired *t* test showed statistically significant improvement in ISC knowledge. A mean score of 92–93 demonstrated a high level of participant education retention.

Conclusions: The CABIC method of teaching clean ISC is associated with improvement in generalized clean ISC knowledge and performance scores.

Clinical Relevance: The CABIC method can be integrated into clinical practice as an evidence-based approach to teaching ISC.

Keywords: Intermittent catheterization; clean intermittent catheterization; intermittent self-catheterization; patient education.

Introduction

Catheterization is used to allow emptying of the bladder when the body is unable to self-regulate urinary output. Infection risk is increased when a device is entered into the bladder. Patients who are required to catheterize themselves at home are generally taught a clean intermittent self-catheterization (ISC) technique. The majority of patient teaching is provided by nurses. However, nurses typically learn the skill set necessary to perform catheterizations in nursing school where the emphasis is on using an aseptic technique. Therefore, the clean ISC technique is usually taught in specialty areas (urology or rehabilitation) by nurses who have been taught the technique from other nurses (Newman & Willson, 2011). Bedside training is efficient, yet the lack of consistency increases the risk for error.

There has not been a protocol or standard established that is widely accepted and utilized regarding the teaching of ISC. In 2011, 11 nurse specialists in urology and rehabilitation were recruited from across the country to form the Clinical Advisory Board for Intermittent Catheterization (CABIC) group. The group was initiated by a urinary catheter manufacturer with the purpose of increasing education to providers and patients. Following a lengthy discussion, it was determined that the greatest failing was the lack of consensus among healthcare professionals. As a group, we decided to develop guidelines for healthcare professionals to use when teaching patients clean ISC (Table 1). To reduce any bias, these guidelines could be used regardless of what type or brand of catheter was chosen. The guidelines themselves do not contain manufacturer recommendations; they refer to both hydrophilic and straight with gel catheters alike. The CABIC guidelines were published in 2013 but have not been evaluated for efficacy. The purpose of this study is to examine the efficacy of the CABIC guidelines for teaching clean ISC.

Correspondence: *DaiWai M. Olson, Neuroscience Nursing Research Center, University of Texas Southwestern Medical Center, Dallas, TX. E-mail: daiwai.olson@utsouthwestern.edu*

1 University of Texas Southwestern Medical Center, Dallas, TX, USA

2 Texas Woman's University, Denton, TX, USA

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.rehabnursingjournal.com).

Accepted August 22, 2016.

Cite this article as:
Le Danseur, M., Stutzman, S. E.,Wilson, J., Sislak I., & Olson, D.W. (2018). Is the CABIC clean intermittent catheterization patient education effective? *Rehabilitation Nursing, 43*(1), 40–45. doi: 10.1002/rnj.306

Table 1 The CABIC method teaching guide

	CABIC Method
Steps	Details
Gather supplies	Choose appropriate catheter type and size. Drainage receptacle. Cleaning agent. Adaptive device as needed.
Choose a location	Clean environment if possible. Toilet, wheelchair, shower, bed. Can be done at home, work, school, etc.
Wash hands	May use soap and water or alcohol-based gel product.
Prepare supplies	Lubricate the catheter either with gel or for hydrophilic add or break water bag.
Position patient	Male versus female, over toilet or with drainage receptacle.
Urethral cleansing male	Male: uncircumcised male retract foreskin, cleanse in circular motion starting with urethral opening. Repeat x3. Use soap and H_2O or perfume free wipes.
Urethral cleansing female	Female: Spread legs, locate urethral opening, use mirror if needed. Spread labia, cleanse front to back using wash cloth or perfume free wipe. Use one cloth for each swipe.
Insert catheter	Insert until urine flows, advance 3 cm further, leave in place until urine stops flowing.
Difficult to pass	For male reposition so that penis is perpendicular to the body. Have patient take deep breaths or cough at the time you pass the catheter through the sphincter. See troubleshoot section for more details.
When flow stops	Remove the catheter slowly allowing any further urine to drain.
Cleanse area	Cleanse area with soap and water or wipe. For uncircumcised male return foreskin.
Dispose of catheter & supplies	
Wash hands	

Note. CABIC = Clinical Advisory Board for Intermittent Catheterization.

In addition, this study aims to determine the accuracy of demonstrating the clean ISC technique in nursing students.

Background

There are multiple disease processes that require a patient to perform urinary catheterization. There are 10,000 new multiple sclerosis cases each year; with this disease, the patient has a 40%–90% chance of needing to perform ISC as their disease progresses. There are 12,000 new spinal cord injury patients each year, all of which will require catheterization initially, and the majority will continue throughout their life span. There are 800,000 new strokes per year, and 15% of these will require ISC. There are an estimated 60,000 new cases of Parkinson's disease each year, and 37%–72% of these will require ISC. And finally, there are 1,500 new cases of spina bifida each year, and 61% will require catheterization (Dorsher & McIntosh, 2012).

Any urinary catheterization carries an increased risk for urinary tract infection (UTI) due to the potential introduction of bacteria. Patients who experience urinary retention and neurogenic bladder have the options of an indwelling catheter or intermittent catheterization. The advantages of intermittent catheterization over indwelling urinary catheters include (1) improved self-care independence, (2) reduced risk of UTIs, (3) fewer barriers to sexual activity, and (4) no drainage bag needed (Sheldon, 2013).

Patients are able to utilize a clean ISC technique when they perform catheterization at home in their normal flora environment. Moore, Burt, and Voaklander (2006) compared the UTI rates for patients performing intermittent catheterization utilizing clean ISC versus aseptic technique during their inpatient rehabilitation stay. They standardized a protocol for both clean and aseptic technique, which was taught to staff, patient, and family. The protocol was not published. Their findings showed clean ISC patients had symptomatic UTIs at the rate of 37% and the aseptic technique at a rate of 45% ($p < .05$). The study also showed a cost and time saving benefit to the healthcare system as well as the patient benefit of allowing them to practice catheterizing in the hospital as they would at home. The Centers for Disease Control and Prevention (CDC) website (www.cdc.gov/hicpac/) references the guidelines by Gould, Umscheid, Agarwal, Kuntz, and Pegues (2010), which support a clean (vs. aseptic) technique for intermittent catheterization in a nonacute care setting. However, the most recent guidelines are from 2010, and there is a call for additional research to further reduce the risk of infection.

Patients who are taught ISC have a diverse set of educational needs due to their diagnosis, age, psychosocial and physical limitations, and education background. Technology has improved the materials used to make catheters (e.g., they are smoother, there are more lubrication options, they are disposable, the eyelets more polished, and they come in varying degrees of flexibility). There are many research opportunities to determine what changes have or will decrease UTIs. But if the teaching method used for this research is inconsistent and undetermined, that leaves the door open for unaccounted for variables that may have an effect on our outcomes and weaken our results. Therefore, it is suggested that, before we can research the benefits of catheter technology, we need to develop and standardize our teaching method. For this reason, it is important that ISC education be repetitive, adaptive, and uniformly taught among nurses (Wilson, 2015; Woodward, Steggal, & Tinhunu, 2013).

There are multiple videos available for patient education use, each with a focus on a particular catheter, but the technique varies in each video. It is rare to find instructions for teaching clean ISC in a nursing textbook. One of the most commonly used medical surgical nursing textbooks describes "clean technique" as patients washing their hands before and after they perform a catheterization (Lewis, Dirksen, Heitkemper, Bucher, & Harding, 2014). These steps are necessary, but not all-inclusive. There are written instructions available online that give step-by-step instruction for ISC by the Society of Urologic Nurses and Associates (SUNA) and the National Institute for Health (NIH), but they too are inconsistent and do not address single-use catheters or hydrophilic catheter use (Bortel, Hensley, Kliever, Lesher, & Newman, 2010; CABIC, 2013; Clincial Center–National Institutes of Health, 2016). In 2008, Medicare began paying for single-use catheters in an effort to decrease UTIs, which was a shift from previous education that teaches individuals how to clean and reuse their catheters. For this reason, having up-to-date information available for patients is imperative. The purpose of this study was to examine the efficacy of the CABIC teaching consensus for clean ISC (CABIC, 2013). In addition, this study aims to determine the accuracy of demonstrating the clean ISC technique in nursing students.

Methods

This study is a prospective nonrandomized pre–post study of an educational intervention. The study was approved by the institutional review board of the University of Texas Southwestern Medical Center. Prospective study subjects were considered eligible if they were over the age of 18, English speaking, and currently enrolled student as a junior in their first semester (J-1) at Texas Woman's University (TWU). The decision to enroll J-1 students was purposive to preserve the novelty of exposure (i.e., patients would not be expected to have been exposed to catheterization procedures). The J-1 TWU subjects had not yet been exposed to aseptic technique nor urinary catheterization in the nursing curriculum.

Prospective subjects were informed of the study by group communication (student e-mail) and announcement made at the start of class. Subjects were informed a priori that they would be video recorded performing an ISC procedure on a manikin and that their face would not be included in the video. Following consent, subjects provided demographic data and completed a written pretest of ISC knowledge. The pre- and posttest were written at Flesh-Kincaid grade level 6.8, as the institutional review board requires consents be written so that a layperson can understand the content. Next, the ISC education program using the CABIC method was provided to the students in a classroom setting. To enhance internal validity, all instructions were provided by a single educator using PowerPoint slides and anatomically accurate manikins.

Two weeks following the education intervention, subjects were scheduled to complete a written posttest and to perform a skills demonstration in the TWU simulation lab. Subjects were not given the opportunity to practice ISC before the observation, but they were given a copy of the PowerPoint slides to review. The skills demonstration was performed using a same-gender manikin (i.e., the women used a female manikin and the men used a male manikin). This was done to simulate a true self-catheterization. The manikin piece was also placed between the legs of the subjects so that they could experience what it would be like for a patient to perform the task. To ensure that all actions were captured for data collection, subjects were asked to verbalize each step as well as demonstrate it. Each session was video recorded and scored in a private room using the Le Danseur Instrument (LDI; Figure 1). To further protect confidentiality, video recording was done so that the participant's face was not visible. Video recording individual scores for subjects were not shared with TWU faculty nor with TWU staff.

Measures

Data were collected using student self-report, written test, and scored video recording. Participant demographic data are entirely self-reported including age (reported as decile to enhance anonymity), race, gender, previous healthcare experience/employment, and previous exposure to intermittent catheterization. The written test was the same for both the pre- and posttest. To reduce a retest bias, the posttest was given 1–2 weeks after the education intervention. The test consisted of true/false (4), multiple choice (5), and free-text response (1) questions (Supplemental Digital Content, http://links.lww.com/RNJ/A2).

Scoring performance of clean ISC was completed using scoring guidelines developed for this study based on the CABIC method (Table 1). The LDI was developed to evaluate a participant's skill in performing a clean ISC (Figure 1). A score of 2 was given if the step was completed successfully and could be observed or heard on the video. A score of 1 was given if the step was only partially completed. A score of 0 was given if the step was missed completely (could not be observed or audibly heard on the video). The instrument has two scoring sections, raw and weighted. The raw score counts each step as equal in value (e.g., "washing hands" and "gathering supplies" are of equal importance). The weighted score places higher value on some steps compared to others (e.g., "washing hands" is more important than "gathering supplies").

The Le Danseur Instrument

Clean Intermittent Catheter Training-Skills Check Off

Participant Information Subj. ID # _____ Simulation Date _____

Scoring Guide

Completed correctly **2**

Partially completed **1**

Not Done **0**

STEP	SCORE	Raw Value	Raw Score	Weighted Value	Weighted Score
Gather supplies	2	5	10		5
Wash hands	2	5	10		15
Prepare supplies on clean surface	2	5	10		10
Position self	2	5	10		10
Cleanse urethral opening	1	5	5		7.5
Insert catheter avoiding contamination	2	5	10		15
When urine flow stops remove slowly	2	5	10		10
Cleanse area	2	5	10		5
Dispose of supplies	2	5	10		5
Wash hands	0	5	0		0
		TOTAL =	**85**	**TOTAL =**	**82.5**

Figure 1. Scoring example using the Le Danseur Instrument for scoring clean intermittent self-catheterization.

Retaining both raw and weighted scores in the LDI allows for more comprehensive evaluation of learner needs.

Results

From 56 subjects who consented, six were unable to schedule a time in the simulation lab to perform ISC on a manikin and 50 completed all three phases of the study (pretest, posttest, video-recorded ISC on a manikin). Of these, 46 (92%) were female, and the median and mode for age was the second decade (20–30 years old). Subjects were Caucasian (n = 36), African American (n = 4), and Asian (n = 10). There were 10 subjects with prior healthcare experience (e.g., aide), and none of the subjects reported prior exposure to ISC.

Statistical analyses were performed using SAS v9.3 (SAS Institute, Cary, NC); standard measures of central tendency were calculated and examined to support the assumption of normal distribution. The LDI scores for performing clean ISC were similar for raw (mean = 92.1, SD = 7.1) and weighted (mean = 93.1, SD = 6.4). One subject scored below 80% (raw 75%, weighted 72.5%). Using unweighted scoring, 80% (n = 40) of subjects scored at least 90% (prespecified goal); 82% (n = 41) scored ≥90% using weighted criteria scoring. There was no association between pretest scores and LDI scores in clean ISC (p = .95). Free-text responses were adjudicated by the primary investigator (M. L.), who is a clinical nurse specialist familiar with ISC teaching.

Results from a paired t test (Figure 2) demonstrate a statistically significant improvement in ISC knowledge

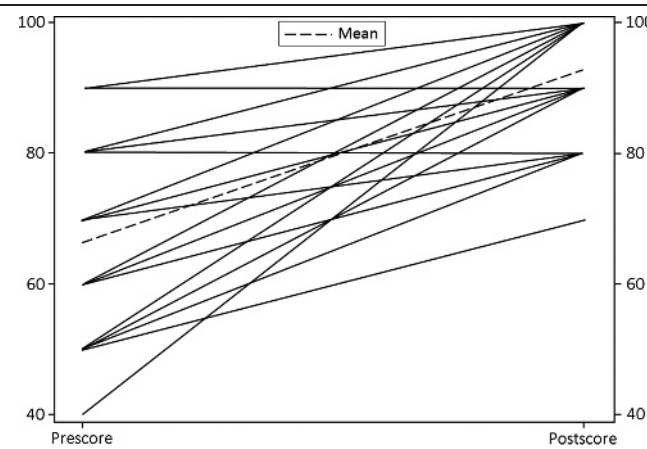

Figure 2. Paired profile comparison of pre- and posttest scores. Solid lines indicate pairing of the pre- and posttest scores for each subject. Dotted line indicates averaged pairing of pre- and posttest scores.

Key Practice Points

- Patients with various diagnoses have made intermittent self-catheterization part of their everyday lives.
- When patients perform ISC at home, aseptic technique is generally not required.
- Currently, there is no consensus or standardization on how to teach clean technique ISC among nurses.
- By standardizing the practice, we can create a solid foundation for future ISC research.

comparing pretest and posttest scores (respectively; mean = 66 [*SD* = 12.7] vs. mean 93 [*SD* = 7.8], $p < .0001$).

Discussion

The foundation of continued research to improve ISC is dependent, in part, on the standardization of patient education. These results support that, without any additional practice, 80% of subjects met the prespecified minimum of 80% performance on LDI. This is even more impressive when one considers that there was a 2-week period of time between initial training and return demonstration. This supports the a priori hypothesis that the CABIC method of teaching ISC is associated with high return demonstration performance.

The LDI can be scored using weighting or raw scores. The decision on weighting values (computational constants) was based on clinical knowledge and is not supported by literature. For example, washing hands before ISC was seen as much higher value than disposing of equipment after ISC. Although there were no formalized tools by which to score observations of ISC, a recognized limitation of the study is the use of the LDI. It is worth noting that similar results were obtained using both weighted and unweighted scores. This would indicate that the tool could be used without weighting as a possible skills check-off for staff.

The higher posttest scores demonstrate that the CABIC method is an effective teaching strategy for ISC. The CABIC method provides a foundation for teaching ISC; adding special positioning, specialized catheters, or adaptive equipment as needed represents the opportunity to individualize and tailor the education to meet the needs of the individual.

Evidence supports that the current average patient performing ISC gets three UTIs a year (Edokpolo, Stavris, & Foster, 2012; Krassioukov, Cragg, West, Voss, & Krassioukov-Enns, 2015). Although there is a current national focus on catheter-associated UTI for indwelling catheters, it is reasonable to expect that future research will focus on UTIs that result from ISC.

Each step within the CABIC method was quantified to determine which steps were missed most often. Washing of hands following the procedure was by far the most common error. This can be helpful in future education efforts, making an effort to reinforce this step.

Limitations

As noted above, this was the first study to utilize the LDI for evaluation of the ISC. Therefore, this study was intentionally designed to be a small, single cohort study, but it does fall short of generalizability of the results. Future studies repeating the study methods using similar or different types of subjects would make the results more generalizable.

It is both a limitation and strength that the teaching and grading of the tests and LDI were performed by the principal investigator only. This is a benefit in that it reduced a risk of limited interrater reliability. However, the use of a single instructor leaves open the possibility that the instructor (and not the instructions) is responsible for the results. Using first-year nursing students naive to catheterization allowed for approximating a layperson. Although the study design took measures to remove bias and no incentive was offered to the students for a high performance on the posttest, the degree to which students studied remains unknown. Additional studies are needed with multiple qualified reviewers to ensure bias is lessened. Although this study has minimal generalizability, it does provide a strong foundation for others to build upon.

Conclusion

The results support the efficacy for using the CABIC teaching consensus as a platform for clean ISC. As measured by the Le Danseur instrument, the CABIC guidelines of teaching clean ISC are associated with high general ISC knowledge and high performance scores in return demonstration of subjects performing clean ISC on same-gender manikins. The LDI is adequate for scoring videotape of clean ISC behaviors. Future research of patient education and patient retention of education is needed to determine the usefulness of this tool.

Acknowledgments

The authors thank the Neuroscience Nursing Research Center and staff at the Texas Woman's University simulation lab. They wish to acknowledge funding from Sigma Theta Tau, Wellspect Healthcare, and the Rehabilitation Nurses Foundation. The authors declare no conflict of interest.

References

Bortel, K., Hensley, D. L., Kliever, E. M., Lesher, T. A., & Newman, D. (2010). *Adult intermittent self-catheterization patient fact sheet*. Pitman, NJ: Society of Urologic Nurses Associates. Retrieved from https://www.suna.org/download/members/selfCatheterization.pdf

CABIC. (2013). *Clean intermittent catheterization CIC: Guidelines for healthcare professionals*. Retrieved from http://www.lofric.us/~/media/M3%20Media/WELLSPECT/Urology/1224373%20CABIC%20Book.ashx

Clincial Center–National Institutes of Health. (2016). Clean intermittent self-catheterization (CISC): Procedure for women. *Patient Information Publications*. Retrieved from http://www.cc.nih.gov/ccc/patient_education/pepubs/bladder/ciscwomen5_22.pdf

Dorsher, P. T., & McIntosh, P. M. (2012). Neurogenic bladder. *Advances in Urology*, *2012*, 816274.

Edokpolo, L. U., Stavris, K. B., & Foster, H. E. Jr. (2012). Intermittent catheterization and recurrent urinary tract infection in spinal cord injury. *Topics in Spinal Cord Injury Rehabilitation*, *18*(2), 187–192.

Gould, C. V., Umscheid, C. A., Agarwal, R. K., Kuntz, G., & Pegues, D. A. (2010). Guideline for prevention of catheter-associated urinary tract infections 2009. *Infection Control and Hospital Epidemiology*, *31*(4), 319–326.

Krassioukov, A., Cragg, J. J., West, C., Voss, C., & Krassioukov-Enns, D. (2015). The good, the bad and the ugly of catheterization practices among elite athletes with spinal cord injury: A global perspective. *Spinal Cord*, *53*(1), 78–82.

Lewis, S. M., Dirksen, S. R., Heitkemper, M. M., Bucher, L., & Harding, M. (2014). *Medical-surgical nursing: Assessment and management of clinical problems*. Oxford: Mosby.

Moore, K. N., Burt, J., & Voaklander, D. C. (2006). Intermittent catheterization in the rehabilitation setting: A comparison of clean and sterile technique. *Clinical Rehabilitation*, *20*(6), 461–468.

Newman, D. K., & Willson, M. M. (2011). Review of intermittent catheterization and current best practices. *Urologic Nursing*, *31*(1), 12–28.

Sheldon, P. (2013). Successful intermittent self-catheterization teaching: One nurse's strategy of how and what to teach. *Urologic Nursing*, *33*(3), 113–117.

Wilson, M. (2015). Clean intermittent self-catheterisation: Working with patients. *British Journal of Nursing*, *24*(2), 76, 78, 80 passim.

Woodward, S., Steggal, M., & Tinhunu, J. (2013). Clean intermittent self-catheterisation: Improving quality of life. *British Journal of Nursing*, *22*(9), S20, s22–25.

Instructions:

- Read the article. The test for this CE activity can only be taken online at www.NursingCenter.com/CE/RNJ. Tests can no longer be mailed or faxed. You will need to create (its free!) and login to your personal CE Planner account before taking online tests. Your planner will keep track of all your Lippincott Professional Development online CE activities for you.
- There is only one correct answer for each question. A passing score for this test is 9 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 Professional Development: 1-800-787-8985.

Registration Deadline: February 29, 2020

Disclosure Statement:
The authors and planners have disclosed that they have no financial relationships related to this article.

Provider Accreditation:

Lippincott Professional Development will award 1.0 contact hour for this continuing nursing education activity.

Lippincott Professional Development 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 hour. Lippincott Professional Development is also an approved provider of continuing nursing education by the District of Columbia, Georgia, and Florida, CE Broker #50-1223.

Payment:

- The registration fee for this test is FREE for members and $12.50 for nonmembers.
  1. ARN members can access the discount by logging into the secure "Members Only" area of http://www.rehabnurse.org.
  2. Select the Education tab on the navigation menu.
  3. Select Continuing Education.
  4. Select the *Rehabilitation Nursing Journal* article of your choice.
  5. You will appear at nursing.CEConnection.com.
  6. Log in using your Association of Rehabilitation Nursing username and password. The first time you log in, you will have to complete your user profile.
  7. Confirm the title of the CE activity you would like to purchase.
  8. Click start to view the article or select take test (if you have previously read the article.)
  9. After passing the posttest, select +Cart to add the CE activity to your cart.
  10. Select check out and pay for your CE activity. A copy of the receipt will be emailed.