Targeting zero CAUTIs

Empower nurses and proactively reduce urinary catheter device use

By Lee Knill, BSN, RN, MEd, CMSRN; Ralitsa Maduro, PhD; Juanita E. Payne, RN

CATHETER-associated urinary tract infections (CAUTIs) remain one of the most common causes of healthcare-associated infections, despite extensive evidence-based efforts to improve patient safety. (See *CAUTI costs*.)

To address CAUTIs at Sentara Healthcare, an initiative was implemented to standardize appropriate indications for temporary urinary catheter insertions using the electronic health record. The indications for temporary insertions were based on guidelines from the Centers for Disease Control and Prevention's Healthcare Infection Control Practices Advisory Committee and the Association for Professionals in Infection Control and Epidemiology.

Around the same time, Sentara Obici Hospital conducted a quality improvement (QI) project to review CAUTIs by insertion indication, explore alternatives to placing a catheter for that indication, and develop a plan for standardizing care.

Developing a plan

As part of the systemwide initiative, all providers were required to choose from a standardized list of appropriate indications when they ordered a temporary urinary catheter. This practice allowed the auditors, who were also members of the QI project task force, including nursing leadership (the chief nursing officer and unit managers and bedside nurses), to easily identify the original reason the catheter was inserted.

As the QI taskforce examined CAUTIs by indication, we discovered that most of the patients who developed infections had the catheter placed for urinary retention or strict intake and output. Our team questioned whether any alternatives to inserting an indwelling urinary catheter were available for these indications. Literature, including the American Nurses Association's (ANA's) Streamlined Evidence-Based RN Tool: Catheter Associated Urinary Tract Infection (CAUTI) Prevention, recommends some alternatives by indication. The ANA tool (download at tinyurl.com/y8rz6j85) focuses on broad practice strategies to reduce CAUTIs (fewer catheters used, timely removal, and insertion maintenance and postre-

moval care), and many of these strategies had already been implemented with great success in our facility. In our effort to proactively reduce CAUTIs, we decided to build on the ANA tool and focus on using fewer catheters.

We started our effort by polling bedside nurses and staff urologists for ideas about how we could reduce catheter insertions. After many alternatives were discussed and refined, we developed a urinary catheter insertion decision tree in the form of an algorithm to provide clinicians with alternatives to placing a catheter based on the indication. (See *Urinary catheter insertion decision tree.*) We presented this algorithm to our medical staff executive team, which approved the protocol, giving bedside nurses the autonomy to use these alternatives instead of inserting an indwelling urinary catheter even if a provider ordered one.

Encouraging nurse autonomy

Using the algorithm, nurses are encouraged to provide care at the top of their scope of practice, working through the decision tree for alternatives to the specified indication. For instance, if the patient has a catheter order for urinary retention, the nurse assesses for urinary retention (presence of bladder distention, evaluation of the patient's intake and output, signs of urine leakage), uses a noninvasive bladder scanner to determine the current urine volume in the bladder, and then makes the best clinical decision for the patient about the necessity for the catheter.

Training and implementing

In January and February 2015, Sentara Obici educators trained staff nurses, which included one-on-one hands-on training and a "frequently asked questions" tip sheet with different scenarios to guide nurses in their critical thinking. The algorithm went live in March 2015. During daily rounding and huddles, nursing leadership focused on catheter insertion critical thinking and early removal of necessary catheters.

CAUTI costs

Catheter-associated urinary tract infections (CAUTIs) are linked to increased length of stay, worsening patient outcomes, and increased healthcare cost.

0.5-2.4 days: increased length of stay

$1,005 to $7,200: associated expenses

17%: percentage of hospital-acquired bacteremia linked to a urinary source

10%: mortality rate

$115 million and $1.82 billion: annual reported costs of preventable CAUTIs in the United States.

Source: Pashnik et al. 2017.

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Reviewing outcomes

By using the algorithm and evidence-based practices for catheter maintenance, the hospital had no CAUTI events from September 2015 to January 2017. To empirically evaluate the efficacy of the algorithm, the research committee, which included the authors and a bedside nurse, obtained institutional review board approval for a retrospective study.

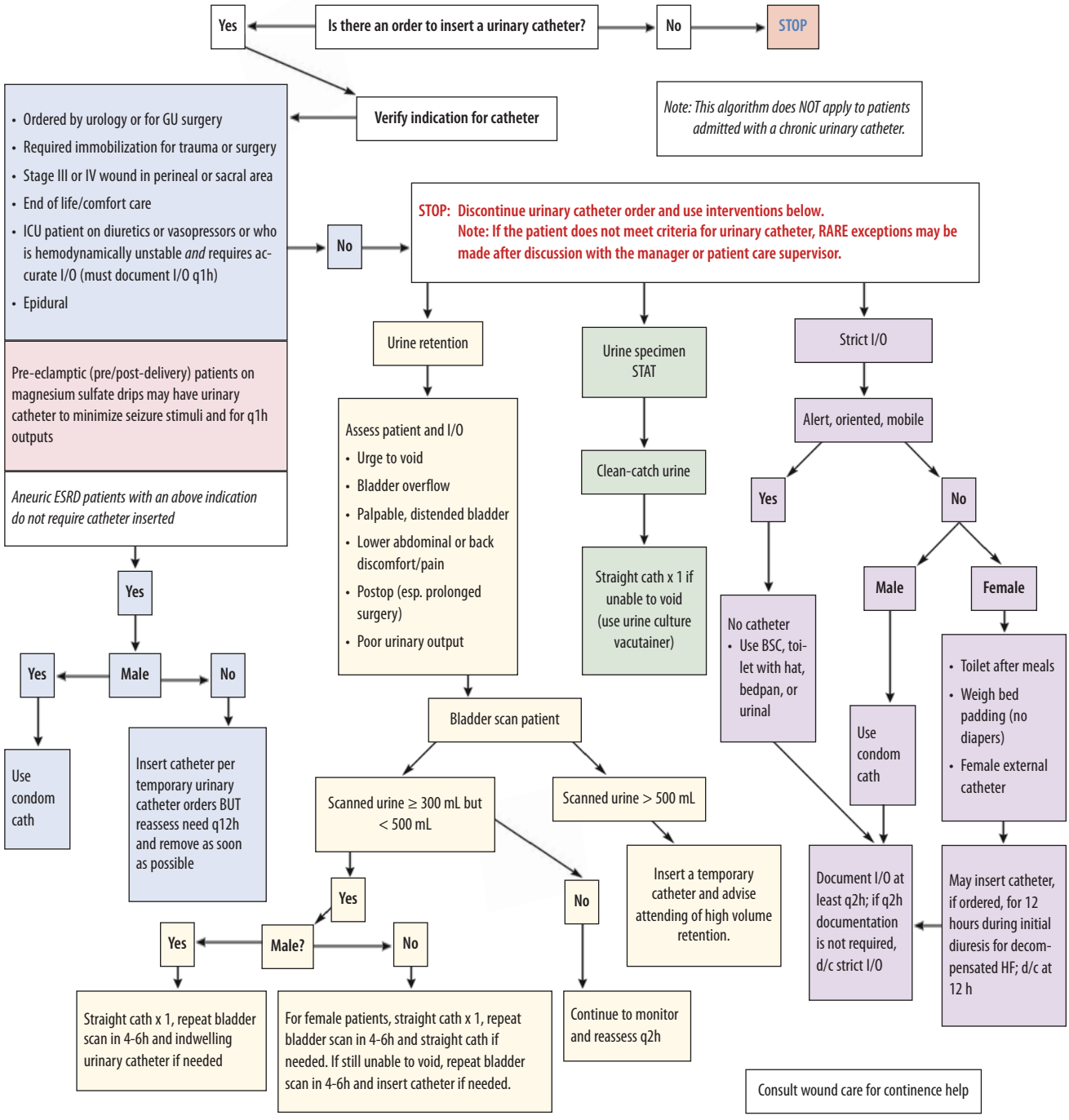
The data were divided into preimplementation (March 1, 2013 to June 30, 2014) and post-implementation (March 1, 2015 to June 30, 2016), excluding July 1, 2014 through February 28, 2015 to create equivalent cohorts, accounting for seasonal and monthly differences and the education period for the clinical staff. Use of urinary catheters and CAUTIs decreased after implementation of the algorithm. (See *Outcomes.*)

Planning for the future

Implementing the algorithm, using noninvasive methods (condom catheters, bedside commodes with measurable collection hats, urinals, and bedpans) for accurate urine intake and output measurements, and avoiding indwelling catheters unless medically necessary, Sentara Obici has reduced the inci-

Urinary catheter insertion decision tree

The algorithm created at Sentara Obici Hospital gives nurses the autonomy to adjust provider orders for urinary catheter insertion by working through the decision tree and using their critical-thinking skills.



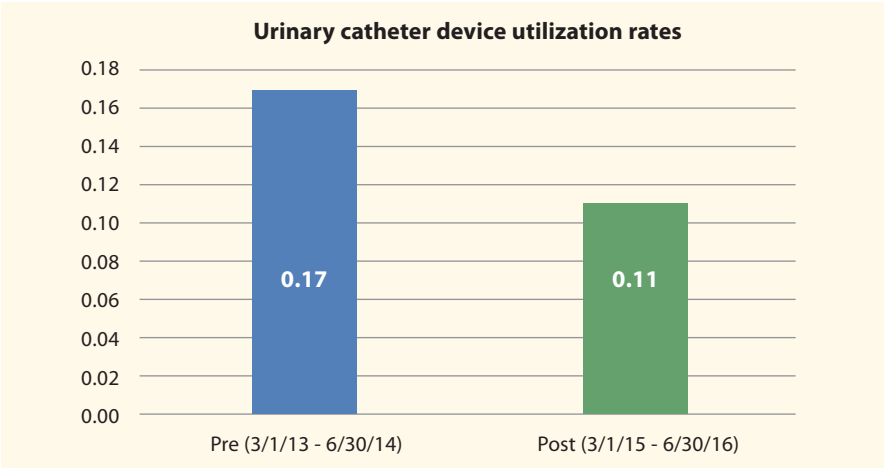
Key: BSC = bedside commode, cath = catheter, d/c = discontinue, ESRD = end stage renal disorder, GU = genitourinary, HF = heart failure, ICU = intensive care unit, I/O = input/output

Outcomes

A retrospective study of the urinary catheter insertion decision tree implementation found reductions in catheter use and catheter-associated urinary tract infections (CAUTIs.)

Urinary catheter use

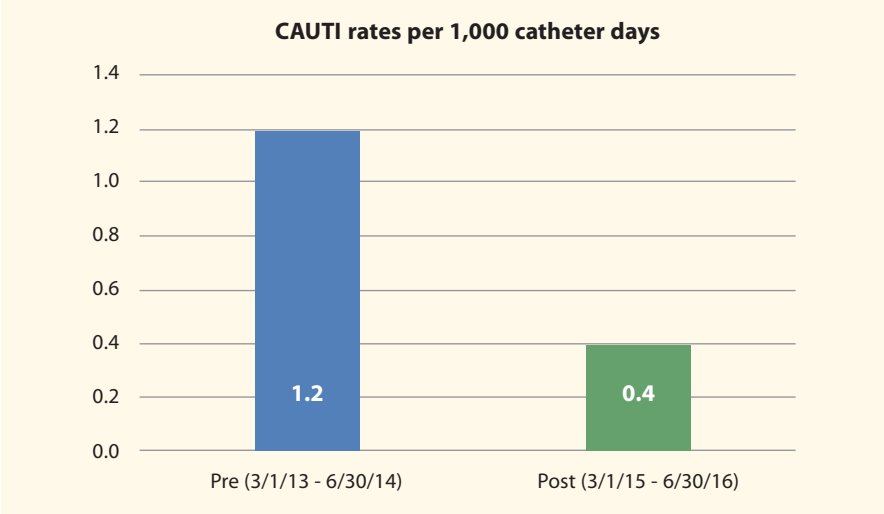
Urinary catheter device utilization rate is defined as the number of indwelling catheter days/number of patient days. Before implementation, the urinary catheter device utilization rate was 0.17 (7573/44535), after implementation, it dropped to 0.11 (7573/44535); t(5289.94) = 11.81*, $p < .001$.



*The t-test is a statistical hypothesis test applied to determine if a significant difference exists in the distribution of two continuous variables. In the parentheses are the degrees of freedom, which represents the number of values in the final calculation of a statistic that are free to vary. 11.81 is the actual calculated t-score that's compared to a critical value point on the t-test distribution. The result of this comparison is a statistically significant difference between the pre- and post-implementation data.

CAUTIs

Before implementation, the hospital had nine CAUTIs that developed out of 7,573 temporary indwelling catheters inserted, for a rate of 1.2 (per 1,000 catheter days). After implementation, two CAUTIs developed out of 5,244 temporary indwelling catheters inserted, for a rate of 0.4 (per 1,000 catheter days). The decrease was not statistically significant because of the low sample size.



dence of CAUTIs. Allowing nurses the autonomy to operate to the top of their scope of practice and use their critical-thinking skills at the bedside has improved patient safety and outcomes. After the success of this QI project, the Sentara Healthcare System rolled out the urinary catheter insertion decision tree systemwide in an effort to reduce CAUTI rates in all of its facilities. ★

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