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-
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.


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.

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 pre-implementation (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

Yes

Is there an order to insert a urinary catheter?

No

STOP

Verify indication for catheter

Note: This algorithm does NOT apply to patients admitted with a chronic urinary catheter.

STOP: Discontinue urinary catheter order and use interventions below.

Note: If the patient does not meet criteria for urinary catheter, RARE exceptions may be made after discussion with the manager or patient care supervisor.

Urine retention

Urine specimen STAT

Strict I/O

Alert, oriented, mobile

Yes

No

Catheter indication

Ordered by urology or for GU surgery

Required immobilization for trauma or surgery

Stage III or IV wound in perineal or sacral area

End of life/comfort care

ICU patient on diuretics or vasopressors or who is hemodynamically unstable and requires accurate I/O (must document I/O q1h)

Epidural

Pre-eclamptic (pre/post-delivery) patients on magnesium sulfate drips may have urinary catheter to minimize seizure stimuli and for q1h outputs

Anuric ESRD patients with an above indication do not require catheter inserted

Yes

No

Male

Female

May insert catheter, if ordered, for 12 hours during initial diuresis for decompenated HF; d/c at 12 h

Consult wound care for continence help

Urine specimen

Clean-catch urine

Yes

No

Straight cath x 1 if unable to void (use urine culture vacutainer)

No catheter

• Use BSC, toilet with hat, bedpan, or urinal

• Toilet after meals

• Weigh bed padding (no diapers)

• Female external catheter

Document I/O at least q2h; if q2h documentation is not required, d/c strict I/O

Yes

No

Insert a temporary catheter and advise attending of high volume retention.

Continue to monitor and reassess q2h

Consult wound care for continence help

Bladder scan patient

Scanned urine ≥ 300 mL but < 500 mL

Scanned urine > 500 mL

Yes

No

Yes

No

Male?

No

Insert catheter per temporary urinary catheter orders BUT reassess need q12h and remove as soon as possible

Insert temporary catheter and advise attending of high volume retention.

Continue to monitor and reassess q2h

Consult wound care for continence help

Bladder scan patient

Straight cath x 1, repeat bladder scan in 4-6h and indwelling urinary catheter if needed

For female patients, straight cath x 1, repeat bladder scan in 4-6h and straight cath if needed. If still unable to void, repeat bladder scan in 4-6h and insert catheter if needed.
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.

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.

Selected References


