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Toward eliminating catheter-associated urinary tract infections in an academic health center

Swapnil D. Kachare, MD, MBA,[a,b] *Cheri Sanders, RN, BSN,*[b] *Kimberly Myatt, RN, BSN,*[b] *Timothy L. Fitzgerald, MD,*[a,b] *and Emmanuel E. Zervos, MD*[a,b,*]

[a] *Division of Surgical Oncology, Department of Surgery, The Brody School of Medicine, East Carolina University, Greenville, North Carolina*

[b] *Surgical Services, Vidant Medical Center, Greenville, North Carolina*

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ABSTRACT

Background: Eliminating catheter-associated urinary tract infections (CAUTI) is at the forefront of quality improvement and cost reduction for payers and hospitals alike. Herein we describe a double-focused strategy to eliminate CAUTI's on a surgical oncology unit over the course of 24 mo.

Methods: CAUTI's were tracked on a 30-bed surgical oncology unit 12 mo before and 12 mo after implementation of specific measures aimed at (1) decreasing utilization and (2) increasing catheter bundle and hand hygiene compliance. A policy of early Foley catheter removal was implemented. Univariate analyses were performed comparing nominal and numerical variables between the pre- and post-intervention groups.

Results: The pre- and post-intervention groups comprised of 1376 and 1467 patients, respectively. Postintervention, there was a significant decrease in both total Foley ($P = 0.02$) and patient ($P = 0.03$) days. This resulted in a significant reduction in utilization rate from 0.28 to 0.24, ($P < 0.0001$) and median CAUTI rate from 4.6 to 0.0 ($P = 0.03$). Reduced CAUTIs were associated with significant improvements in monthly bundle compliance at ≥95% (75% *versus* 17%, $P = 0.003$) and hand hygiene compliance at ≥95% (92% *versus* 58%, $P = 0.05$). Among our thoracic epidural cohort ($n = 11$), three patients (27%) required reinsertion for urinary retention. None of these epidural patients were diagnosed with a CAUTI.

Conclusions: Although not eliminated entirely, CAUTIs on our unit were significantly reduced through decreased utilization and improved compliance to institutional patient safety measures. Adoption of these strategies to other inpatient units would not only improve patient safety but also result in significant cost savings.

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* *Corresponding author*. Division of Surgical Oncology, Department of Surgery, East Carolina University, 600 Moye Blvd., Greenville, NC 27834. Tel.: +1 252 744 4110; fax: +1 252 744 5777.

E-mail address: zervose@ecu.edu (E.E. Zervos).

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1. Introduction

Beginning in 2008, Center for Medicare and Medicaid Services (CMS) enacted a policy to penalize hospitals for hospital-acquired infections such as catheter-associated urinary tract infections (CAUTIs) [1,2]. A study from 2012, however, identified no evidence that this CMS policy had any effect on reducing the rate of CAUTIs [3]. In October of 2012, Medicare began to financially incentivize hospitals that provide high-quality care for their patients through the Hospital Value-Based Purchasing (HVBP) program, which consists of three components: patient experience of care, clinical process of care, and outcomes [4]. Currently, outcomes reflect 25% of funds associated with HVBP and by 2016 will include health care associated infections such as CAUTIs [5]. These upcoming changes further underscore the need to eliminate CAUTIs.

Concordant with CMS tracking of CAUTIs in 2008, we began to closely track our own incidence of CAUTIs on a 30-bed surgical oncology unit and identified an above average incidence, placing the unit and its patients at medical (and now financial) risk. According to the 2011 National Healthcare Safety Network (NHSN), which provides annual reports on nationwide average CAUTI rates and catheter utilization ratios for medical and surgical floors of varying intensities [6], we were just over the 90th percentile for CAUTI rates and just under the 75th percentile for catheter utilization. In response to CMS programs and in the interest of patient safety, we implemented measures to try to eliminate CAUTIs on our unit. These measures had two primary goals: (1) to decrease utilization of Foley catheter and thereby overall risk of CAUTI and (2) to improve compliance with those processes of care directly related to the risk of CAUTI, such as hand hygiene (HH) and Foley bundle compliance.

Other institutions have established guidelines to reduce CAUTIs; however, according to the 2011 NHSN report, >16,000 patients nationally were diagnosed with CAUTIs in that year [6]. Continued efforts are required to develop methods to eliminate CAUTIs. Foley catheters are used throughout the hospital; yet surgical patients are thought to be the source of most CAUTIs [7]. Therefore, targeting CAUTI elimination on a surgical floor may provide a model to eliminate catheter-associated infections throughout the inpatient setting. The objective of this study was to test the feasibility and effectiveness of implementing an intervention that targets both catheter use and provider compliance to reduce CAUTIs. Herein we describe our experience in transforming a poorly performing unit for CAUTI into one that is now performing at the highest levels locally and nationally.

2. Methods

2.1. Setting

This study was carried out on a single 30-bed surgery unit between November 1, 2011 and October 31, 2013 at Vidant Medical Center, a 960-bed tertiary care facility located in Greenville, North Carolina. The unit is comprised of patients undergoing major abdominal (i.e., hepatobiliary, pancreatic, colon, urologic and gynecologic resections) and head and neck cancer operations. The 12-month period between November 2011 to October 2012 and November 2012 to October 2013 represent the pre- and post-intervention periods, respectively.

2.2. Definition

CAUTIs are defined as the presence of symptomatic UTI or asymptomatic bacteremic UTI in patients whom an indwelling catheter is in place for >48 h. The definition did not change throughout the entire 24-month study period.

2.3. Interventions

Two interventions designed to decrease utilization were implemented in November 2012. First, hospital-wide guidelines were published describing the indications for Foley catheters and medical staff were encouraged to adhere to them. These are included in Table 1. Second, specific measures aimed at early removal and decreased reinsertions were also implemented. Early removal measures included (1) daily electronic "hard-stop" queries to the primary services through the electronic medical record, and (2) direct contact to the primary team as to medical necessity for continued Foley use. Physicians were provided education and coaching on recommended best practice and early removal of Foley catheters. Physicians were further encrouraged to remove catheters even in patients with indwelling thoracic epidural anesthesia after a small pilot study demonstrated no deleterious effects. In this study, 11 patients with thoracic epidural catheters had their Foley catheters removed on POD 1. Of the 11 patients, only 3 required reinsertion due to urinary retention, none of whom developed a CAUTI.

In July of 2012, a Foley removal panel was implemented to minimize reinsertions by guiding the management of patients after Foley removal and putting in place guidelines for Foley reinsertions (Figure). Processes aimed at minimizing CAUTIs were monitored and tracked for both periods. These included HH compliance and Foley bundle compliance. The Foley bundle is outlined in Table 2.

Table 1 – Guidelines for Foley catheter use at Vidant Medical Center, Greenville, NC.

Guideline number	Guidelines for Foley catheter use
1	Patients with acute urinary retention or bladder outlet obstruction
2	Patients undergoing surgical repair of genitourinary tract
3	Critically ill patients requiring frequent and urgent measurements of urinary
4	Incontinent patients requiring healing of open sacral or perineal wounds
5	Patients needing comfort for end of life care
6	Patients with unstable structural injuries that may be compromised (ie, unstable thoracic or lumber spine, multiple traumatic injuries such as pelvic fractures)