Catheter-Associated Urinary Tract Infection (CAUTI) Rate Reduction Strategies: Targeting the Numerator

Introduction

The Centers for Medicare and Medicaid Services (CMS) mandated reporting of CAUTI rates in 2012, and incorporated CAUTI into several inpatient pay-performance metrics. Despite the increased attention paid to this quality of care metric and the associated financial incentives, hospitals across the country have struggled to successfully reduce CAUTI rates. In fact, across the country, the incidence rate of CAUTIs in 2013 was 6% higher than in 2009. Typical evidence-based strategies to reduce CAUTI focus primarily on reducing the number of at-risk patients by reducing inappropriate catheter use and secondarily aim to reduce risk of infection in patients who require catheterization by emphasizing aseptic insertion technique and standardizing maintenance care.

This newsletter will discuss two recent articles that demonstrated it is indeed possible to reduce rates of CAUTIs by using bundled approaches to reduce CAUTI events while simultaneously reinforcing other traditional CAUTI reduction techniques that are focused on reducing the overall use of Foley catheters.

An Effective QI Approach to Reducing CAUTIs

Hospital epidemiologists from the Mayo Clinic implemented the following bundle of interventions consisting of six elements, that they called the “6 C’s of CAUTI reduction”:

- **Consider** alternatives to indwelling catheters
- **Connect** catheters with a securement device
- **Keep it Clean** (promoting perineal care with soap and water)
- **Keep it Closed** (only access the catheter system when medically necessary)
- **Call** for bladder scan before irrigation (to reduce mucosal disruption)
- **Culture** urine only when indicated.

A multidisciplinary team of infection preventionists, hospitalists, care nurses, nurse educators, urology technician supervisors, and systems engineers were involved in the implementation of this “6C” approach. This collaborative structure significantly increased the system-wide buy-in to this QI initiative.

In the first year of the initiative, CAUTI rates decreased by 70% (from 2.0/1000 catheter-days to 0.6/1000 catheter-days). And after the NHSN CAUTI definition changed in 2015 to exclude yeast as a urinary pathogen, the 6C approach led to an additional 30% reduction in the second year of its implementation.

An important aspect of the overall initiative was the implementation changes in the Electronic Health Record (EHR) that were designed to improve compliance with the bundle. For example, documentation of perineal care was standardized so that data could be retrieved and feedback provided to care nurses. Secondly, a protocol was developed to allow nurses to order a bladder scan prior to bladder irrigation.

**Finally, and perhaps most importantly, the EHR ordering system for urine cultures was modified to require that providers enter an indication for culture if the patient had a urinary catheter.** This critically important change in care was important because
inappropriate testing for UTIs in hospitalized patients is common, particularly for patients in the ICU. 4,5

The Mayo Clinic’s order entry modification (shown below) provided clinicians with “point-of-care” education and advice about appropriate criteria for obtaining urine cultures. This in turn led to an impressive 50% decrease in urine culture ordering over the 2 year study period.3

The preceding EMR-driven recommendations were in essence “hard-wired” into clinical care. Such simple and inexpensive changes in the EMR also demonstrate the ability of Clinical Decision Support Systems (CDSSs) to improve the appropriateness of obtaining diagnostic tests such as urine cultures. 6,7

A National Prevention Program Approach to Reducing CAUTIs

A nationwide study sponsored by the Agency for Healthcare Research and Quality (AHRQ) recently implemented a program of interventions in 603 hospitals from 32 states in an effort to reduce CAUTIs. Results from the first four of nine cohorts in this study were recently published8. Five interventions were utilized to reduce rates of CAUTI in hospitalized patients:

- Daily assessments of the presence and need for an indwelling catheter
- Promotion of alternative urine collection methods (condom catheters, intermittent catheterization, etc.)
- Emphasis on the importance of aseptic technique during insertion and proper maintenance care
- Data feedback to units on catheter use and CAUTI rates
- Evaluation of provider and nursing knowledge of the consequences of indwelling catheters (infectious and non-infectious) followed by measures to address knowledge gaps through a variety of media platforms.

The first three interventions are commonly used in CAUTI reduction initiatives, but the last two interventions were somewhat unique. Providing direct feedback on unit-specific CAUTI rates allowed participants to see the results of their interventions in real-time. Further, addressing knowledge gaps on an individual basis encouraged providers and nurses to reduce inappropriate catheter use8.

Between March 2011 and November 2013, hospital units that participated in this initiative had a cumulative decline in CAUTI rate from 2.40/1000 catheter-days to 2.05/1000 catheter-days (p=0.009). This decline was largely due to reductions in CAUTIs on non-ICU wards, CAUTI rates were relatively unchanged in ICU wards. The authors of this study suggested that reasons for this difference in non-ICU v. ICU CAUTI reduction were two-fold: first ICU personnel could not

Incorporating clinical decision support systems into the EMR can dramatically reduce the number of inappropriately ordered urine cultures.
reduce catheter-days in critically ill patients and second, inappropriate culturing practices in ICU patients were not altered by the initiative.  

**Key Recommendations**

These two studies demonstrate that it is possible to reduce CAUTI rates using simple and inexpensive methods. We recommend the DICON member hospitals review their local CAUTI reduction strategies and incorporate some of the approaches outlined above. Specifically, the use of Clinical Decision Support Systems for urine culture orders and indwelling catheter placement orders within the EHR can simultaneously improve compliance with guideline recommendations and address knowledge gaps. Local CDSSs should list appropriate indications for catheter placement or culture ordering, but should not be so restrictive as to prevent providers from ordering a catheter or urine culture outside of the pre-specified indication. Such local guidelines should be discussed and explained to key clinicians prior to their implementation, and knowledge gaps among nurses and other staff should be assessed and addressed. Delivering directed feedback on CAUTI rates and best practices to both providers and nurses can help increase buy-in to local CAUTI reduction initiatives.

**References**


