Safety solutions

Catheter considerations

Targeting zero: One hospital's journey to reduce CAUTI

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Baptist Health Lexington, a 383-bed Magnet® recognized community hospital, reduced catheter-associated urinary tract infection (CAUTI) rates in all critical care environments by a minimum of 60% during 2013. Given the acuity level of patients in CCUs, the incidence of CAUTIs was higher in that population than those in other areas of the hospital. For this reason, we targeted ICU patients for the implementation of a performance improvement (PI) project targeted to reduce the rate of CAUTIs.

Multiple approaches to diminishing infection

As a result of the Affordable Care Act of 2010, the Centers for Medicare and Medicaid Services (CMS) issued a pay-for-performance model for hospitals that included a reduction in federal reimbursement related to the incidence of CAUTI during hospitalization.[1] CAUTIs account for nearly 34% of all healthcare-acquired infections and are the most frequently reported nosocomial infection in the United States.[2] More than 75% of CAUTIs are directly related to the use of an indwelling urinary catheter and 25% of all patients are catheterized during hospitalization.[3] CAUTIs have a negative impact on patient satisfaction, lead to additional comorbidities, account for more than 13,000 deaths annually, and constitute a financial burden of $340 to $370 million for U.S. healthcare organizations.[4,5]

In order to improve patient safety and outcomes, acute care institutions across the country have revised care delivery systems related to indwelling urinary catheters to diminish CAUTI occurrence. Clearly, decreasing the use of indwelling urinary catheters would reduce infection rates; however, that intervention alone is insufficient.[6] A multiple intervention approach to reducing CAUTIs is necessary.

Ongoing efforts to reduce CAUTIs: A prevention bundle

Given the acuity level of patients in CCUs, the incidence of urinary catheters and, thus, CAUTIs is higher in that population than in other areas of the hospital. For this reason, the following six interventions were implemented across five CCUs in an attempt to reduce CAUTIs: (1) communication of CAUTI data to interdisciplinary teams; (2) a nurse-driven, physician approved protocol; (3) problem analysis using Lean principles; (4) daily unit-based surveillance rounds; (5) silver alloy urinary catheters; and (6) an antimicrobial bundle comprised of two cleansing products for patients with an indwelling urinary catheter. First, communication of outcomes to stakeholders is key. At this hospital, the incidence

of CAUTIs, as well as the details of each case, is reported to the Executive Quality Committee, the Physician Quality Steering Committee, and the Infection Control Committee on a monthly basis. In addition, the Infection Control (IC) nurses monitor and enter the incidence of CAUTIs into the National Healthcare Safety Network database. The CMS uses these data to create publically available reports and the hospital uses them for PI opportunities.

From the nursing perspective, a number of strategies were activated. During 2011, a nurse-driven, physician-approved protocol addressing appropriate use of indwelling urinary catheters was developed. This meant that clinical nurses were able to discontinue catheter use without clinical indications. As a result of this protocol, the number of urinary catheters used decreased from a baseline of 9,643 catheter days in 2010 to 4,017 catheter days in 2013, a 58% decrease.

In February 2012, the IC nursing staff conducted a problem analysis using principles from Lean methodology. The analysis identified critical knowledge deficits regarding the morbidity and mortality secondary to CAUTI. Based on this information, the IC nursing staff developed an implementation plan to decrease the incidence of CAUTI that included an educational session and competency validation for nurses. Using an A-3 (Lean principle), the IC nursing staff identified additional counter measures to correct the problem, conducted a cost-benefit analysis, and developed an evaluation plan.

Real-time results

During May 2012, surveillance rounds, including real-time teaching for nurses and physicians related to reducing catheter utilization, were initiated. IC nursing staff rounded each weekday on every CCU. The surveillance rounds facilitated conversations that identified barriers to implementing the existing protocol and encouraged nurses to follow the guidelines. These rounds also facilitated face-to-face coaching of nurses providing direct care for patients with an indwelling urinary catheter related to appropriate catheter care and anchoring device use.

Focusing again on nurses based on observations during rounds, a review of aseptic urinary catheter insertion and proper maintenance and securing of the catheter was held for all critical care nurses. It was decided that concurrent or real-time information would be useful for leaders as they attempted to follow up with staff members related to protocol adherence. In response, the directors of critical care nursing units received in-depth information related to each CAUTI that occurred among their patients via e-mail. The IC staff also met with each director and performed an analysis of each CAUTI. This information helped directors work with clinical nurses to help them prevent future infections. Ongoing relevant information regarding prevention of CAUTIs was also provided to new employees during orientation.

In August 2012, silver alloy catheters were introduced in all five ICUs. Evidence suggests that the use of silver alloy catheters may reduce the incidence of CAUTIs.[7] Findings aren't conclusive, in that, methods used in several of the studies evaluating these catheters were questionable in terms of rigor. Although limited, there's sufficient evidence to encourage the use of silver alloy catheters. For us, the use of silver alloy catheters resulted in an initial decrease in the incidence of CAUTIs; however, the decrease wasn't sustained. Therefore, the IC nurses, in collaboration with the ICU directors and administration, implemented a PI project using a perineal cleansing product containing a silver colloidal.

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A CAUTI antimicrobial bundle

The IC nurses identified an antimicrobial bundle (composed of three cleansing products) that works as an effective barrier against a broad array of Gram-positive and negative organisms (3 hour duration of action) potentially leading to CAUTI.[8] Data collected from a

7-day nursing evaluation of three antimicrobial products (colloidal silver impregnated spray, foam, and wipes) suggested that nurses preferred the foam and wipes as a useful method for perineal care. The manufacturer funded a project that focused on evaluating the use of these products in five CCUs, as well as three areas that admit patients to the ICUs: the OR, ED, and cardiac catheter lab. The project was implemented in two phases over a 4-month period (mid-March through mid-July, 2013).

Improvements in the five CCUs included a decrease in CAUTIs by 60% and a continued decrease in urinary catheter days.

Phase I occurred over a 4-week period. Unit-based education and competency validation with nurses on the five ICUs, OR, ED, and cardiac catheter lab were implemented by IC nursing staff, a clinical nurse specialist, and a representative from the manufacturer. Nurses attended a 15-minute educational session and learned how to use the products during insertion, maintenance, and discontinuation of the indwelling urinary catheter. After attending the session, nurses returned and demonstrated the application of the antimicrobial products to validate competency. (See *Nursing Management* iPad app for additional content.)

Phase II occurred over a 3-month period and consisted of implementation of the products. Throughout this phase, nurses used the antimicrobial wipes to clean the perineum and genitalia before catheter insertion. In addition, the wipes were used twice daily (once per shift) for routine catheter/perineal care, following each incidence of bowel incontinence, and after discontinuation of an indwelling urinary catheter.

Project outcomes

The incidence of CAUTI is complex and there's not one intervention alone that has been found effective in this organization. The effectiveness of the multiple approaches to diminishing CAUTIs must be viewed in terms of the limitations of the project. Given that multiple interventions were introduced, it's difficult to determine the effectiveness of any one approach. CAUTIs did, however, diminish from the previous analysis following the use of the antimicrobial products. Overall improvements in the five CCUs included a decrease in CAUTIs by 60% from the first quarter of 2013 and a continued decrease in urinary catheter days.

One finding is clear, the increased emphasis on the prevention of CAUTIs and decreased use of indwelling urinary catheters have been positive interventions contributing to the success of the use of antimicrobial products and other evidence-based practices within our institution. NM

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