Focused Central Line and Urinary Catheter Rounds- A Multidisciplinary Approach to Reduce Device-Associated Infections in a Pediatric Intensive Care Unit (PICU)

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Abstract

Background: Duration of catheterization is an important risk factor in the development of catheter-associated urinary tract infections (CAUTIs) and central-line associated bloodstream infections (CLABSI). Failure to review and remove catheters increases infection risk. Regular catheter necessity review is recommended by the CDC as one means to decrease hospital acquired infections.

Methods: Children’s Memorial Hermann Hospital (CMHH) is a 240 bed tertiary care hospital with a 30 bed PICU. Multidisciplinary rounds were initiated in March 2014 to review urinary catheter (UC) and central vascular catheter (CVC) necessity. Rounding participants included an Infection Preventionist, nursing Quality Improvement Coordinator, and PICU physician. Participants met 3 times a week to review duration, necessity, alternatives, and removal plan for each UC and CVC on all PICU patients. UC alternatives included bladder scanning, intermittent catheterization or condom catheterization. When CVC removal was not possible, alternatives such as consolidation of access points or changing percutaneous CVCs to tunneled or peripherally-inserted CVCs were considered. Device utilization (DU) ratios and standardized infection ratios (SIR) were collected prospectively pre-intervention (Jan 2013-Feb 2014) and post-intervention (Mar 2014-Feb 2016). National Healthcare Safety Network definitions were utilized.

Results: Rounding resulted in removal of 38% of UCs and removal or alternative for 6% of CVCs. UC DU ratio decreased from mean of 0.36 to 0.30 (p=0.007), 95% CI [0.19, 0.109], and CAUTI SIR decreased from mean of 1.13 to 0.69 (p=0.002), 95% CI [0.163, 0.671]. CVC DU ratio did not change significantly (0.77 to 0.78 (p=0.656)), but CLABSI SIR decreased from mean of 0.49 to 0.37 (p= 0.008), 95% CI [0.185].

Conclusion: Multidisciplinary rounds on device necessity can significantly decrease DU and reduce hospital acquired infections. While CVC DU did not decrease, interventions associated with rounds may have contributed to decreased incidence of CLABSI.

Results (Cont.)

Pre- and post-intervention urinary catheter device utilization reduced from a mean of 0.36 to 0.30 by 0.06 (p=0.003), CI [0.228, 0.985]. Pre- and post-intervention central line device utilization changed from a mean of 0.76 to 0.78 by 0.02 (p= 0.387) CI [0.0644, 0.0256].

Conclusions

Implementation of multidisciplinary rounds on device necessity can significantly decrease DU and reduce CAUTIs and CLABSI. CL interventions proved to be challenging since long-term central access is often necessary in this patient population. While there was an appreciable difference in CVC DU, interventions associated with device necessity rounds such as standardized necessity criteria and CVA awareness may have contributed to decreased incidence of CLABSI.

Concurrent efforts to reduce device-associated infections included multiple trials of CVL alcohol caps beginning in Sept. 2014 with adoption to standard practice in Jan. 2016. Also a hospital-wide anti-CAUTI committee was developed in 2014 with pediatric involvement in educational initiatives beginning in 2015.

References