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Systems engineering methods to reduce catheter-associated urinary tract infections

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Background: Elimination of Catheter-Associated Urinary Tract Infection (CAUTI) is a national patient safety imperative. The Centers for Disease Control and Prevention (CDC) states that Urinary Tract Infections (UTIs) are the most common type of health care-associated infection reported to the National Healthcare Safety Network (NHSN). Among UTIs acquired in the hospital, approximately 75% are linked to urinary catheters.

Aim & Methods: Systems Engineering (SE) and Human Factors Engineering (HFE) methods were used to reduce urinary catheter utilization and CAUTIs in a 610-bed academic medical center in Dallas Texas. These methods were used to define the factors leading to CAUTI and promote standardization of urinary catheter utilization, insertion and maintenance.

Results: The absolute number of catheter-associated urinary tract infections decreased in our hospital system from 135 infections in our baseline year, to 25 cases in our final year (82% reduction) over the three years of the project. Urinary catheter utilization decreased by 28.6% during the same period. The system-wide CAUTI Standardized Infection Ratio (SIR) improved by 84.1% from our baseline of 3.2 to 0.51.

Conclusion: Systems engineering and human factors engineering methods and principles can effectively decrease urinary catheter utilization and CAUTI incidence in an Academic Medical Center Hospital environment.

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