Improving Denominator Data for Catheter Associated Urinary Tract Infection (CAUTI) Surveillance

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Background

Urinary tract infections (UTIs) rank fifth among healthcare-acquired infections (HAIs) reported to the National Healthcare Safety Network (NHSN). Approximately 75% of CAUTIs lead to complications (e.g., bacteremia, endocarditis) accounting for over 13,000 deaths in the US annually.

The key to UTI prevention is avoiding the use of indwelling urinary catheters (IUCs). Clinical indications must be defined to avoid unnecessary use, and prompt removal of IUCs is recommended in the absence of clinical need. Adherence to surveillance protocols and data reporting requirements are equally important for accurate and meaningful data. Finally, data quality impacts microsystems' CAUTI metrics Standardized Infection Ratio (SIR) and Urinary Catheter Standardized Utilization Ratio (SUR).

Problem

The precision in CAUTI denominator data calculation is imperative to mandated reporting, hospital performance comparisons, and data-driven infection prevention efforts. Retrospective reviews of IUC days in 2022 revealed data capture inconsistencies due to electronic medical record upgrades, outdated denominator data extract program, and incomplete end user IUC documentation.

This quality improvement project focuses on revising the data extract logic to enhance data capture by 30% within six months in non-critical care units at an academic acute care hospital.

Study Design

The "Plan-Do-Study-Act" (PDSA) was the framework for enhancing IUC days data capture accuracy, involving a retrospective medical record review (January to July 2023) of IUCs in the Lines, Drains, & Airways (LDA) flowsheet and LDA Avatar. The process measures included capturing individual inpatient admission encounter; applying date/time of inpatient admission status for existing IUCs; applying patient discharge date/time for undocumented IUC removals and/or disposition at discharge; and capping data extract at 23:00 hours. Three PDSA cycles for logic revisions were employed, using IUC standardized utilization ratio (SUR) and CAUTI standardized infection ratio (SIR) as risk measures.

Results

•The modified logic and application of additional exclusion criteria resulted in 100% data capture accuracy based on the established process measures.

•Data extract at 23:00 hours yielded higher number of device days. Time cap at 23:00 hours was retained with an added criterion for exclusion of discontinued IUCs prior to scheduled data abstraction.

•The revised data extract logic improved the CAUTI denominator data quality by 40%. The enhanced denominator data quality positively impacts risk adjustment for CAUTI, generating a more accurate predicted number of urinary catheter days and infections in calculating the urinary catheter SUR and CAUTI SIR.

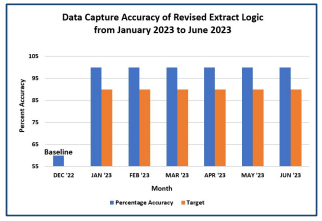

Figure 1. Modified logic yielded 100% accuracy over 6-month period.

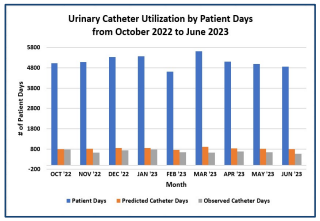

Figure 2. Observed number of catheter days decreased over time.

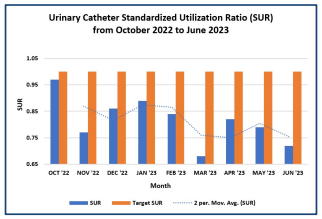

Figure 3. Lower SUR due to increased predicted number of catheter days over time.

Conclusion

•Improved CAUTI denominator data quality resulted in a more accurate predicted IUC days and infections when calculating SUR and SIR.

•SUR and SIR can be utilized to drive infection prevention efforts in non-critical care units.

•Accurate, timely IUC documentation is critical to data quality and integrity. Data accuracy and reliability highly depends on patient assessment and frontline documentation of IUCs in the EMR.

•IP and IT's in-depth understanding of the EMR, NHSN reporting requirements, and LDA database are crucial to logic programming.

•Revised Clarity report can be used as a template for region-wide data collection and automation of data feed to the existing infection surveillance platform.

•Data validation key findings called for continued education of frontline staff/providers in collaboration with clinical informatics, education and patient care services department.

Acknowledgments

Special thanks to Cristine Lacerna, Shima Motoyama, Richard Doan, Sejal Naik, and the Centralized Surveillance Team.

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