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Impact of Central Line Maintenance Bundle on Catheter-Related Blood-Stream Infection in Critical Care Areas

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Selection of Opportunities for Improvement

Healthcare-Associated Infections prevalence has increased by 1.2% due to an influx of Catheter-Related Bloodstream Infections (CRBSI) in Critical Care Areas (CCA). A quality improvement initiative using the Plan-Do-Study-Act model was commenced from April to December 2021 in all CCA.

Key Measures for Improvement

The main goals were to reduce the risk for CRBSI in CCA from 4.4 per 1000 line-days to 3.9 per 1000 line-days.

Process of Gathering Information

Daily laboratory and clinical surveillance were carried out during pre-implementation (July 2020 to March 2021) and post-implementation (April-December 2021) to assess outcomes from patients with relevant clinical indicators. A compliance audit of the care bundle was conducted to assess staff performance.

Analysis and Interpretation

Fifty-one cases were identified from 11,903 patients with lines-days from July 2020 to March 2021. Non-adherence to line care management was an influencing factor in patients acquiring CRBSI. Gaps in practice were observed with 84% bundle compliance. 650 staff did not carry out at least one of the six bundle elements; hand hygiene and daily review of line necessity and line care. Other contributing factors were increased admission of critically ill patients with multiple comorbidities, prolonged length of stay and multiple readmissions from ward to CCA.

Strategies for Change

Action plans included revising components of the Central Line Maintenance Bundle, conducting education programs, regular bedside teaching, developing education videos, optimizing antimicrobial selections for CRBSI patients, regular audits, daily assessment of line care maintenance and good hand hygiene practices. Implementing a structured care bundle and standardization of audit methodology has improved staff understanding.

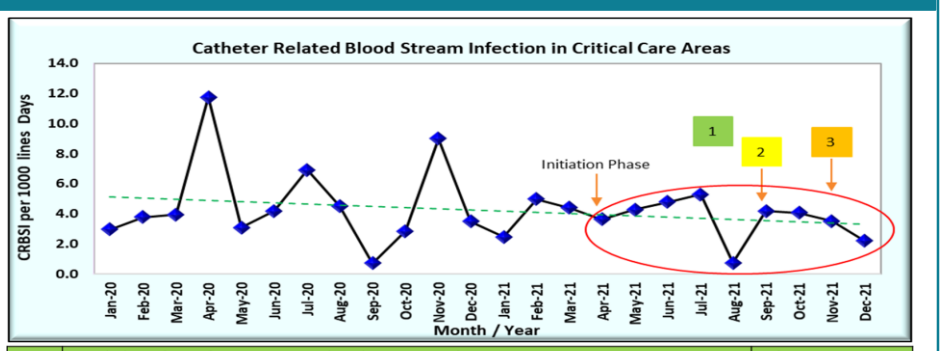
Revised Central Line Maintenance Bundle


CRBSI workshop and bedside education

Multimedia video on central line maintenance bundle

Effect of Change

CRBSI rate was reduced to 3.6 per 1000 line-days from April to December 2021 (43 cases from 11,965 patients with line-days). Staff adherence to the revised care bundle increased from 84% to 86%.



1	Workshop for Infection Control Link personnel	**July 2021**
2	· Introduction of central line maintenance bundle · Revision of antibiotic guidelines	**September 2021**
3	· Periodically assess knowledge and adherence to cleaning guidelines especially scrub the hub. · Assigned person in charge for each cubicle to guide and monitor the team in providing effective care bundle.	**October 2021**

The Next Step

Continuous monitoring and auditing of staff compliance to ensure the improvement is sustained. We are planning to expand the improvement strategies to all wards.

Acknowledgement / reference as necessary

1. Erwin Ista et.al., 2016, " Effectiveness of Insertion and Maintenance Bundles to Prevent Central-line associated Bloodstream Infections in Critically Ill Patients of All Ages : A systematic Review and Meta-analysis".
2. Ling ML et.al.,2016, "APSIC Guide for Prevention of Central Line associated Bloodstream Infections (CLABSI)"

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