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Incorporating implementation science into reducing CLABSI at a tertiary hospital: A quality improvement project with the scrub-the-hub intervention and the COM-B model

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Background

- Central line associated bloodstream infection (CLABSI) is associated with increased mortality, morbidity, healthcare costs, and prolonged hospital stays.
- The objective of this quality improvement (QI) project is to reduce the CLABSI rates through the **scrub-the-hub intervention** implemented via the **Plan-Do-Study-Act (PDSA) approach** and the **Capability, Opportunity, Motivation Behavioral (COM-B) model.**
- The COM-B model is a theoretical framework in behavioral science, increasingly used in infection prevention and control (IPC) efforts to enhance the effectiveness and to ensure sustainable adherence to the IPC practices.

Methods

- This QI project was implemented at **general medical wards at Queen Elizabeth Hospital from October to December 2023.**
- A baseline audit was conducted to study CLABSI rates from July to September 2023.
- Education and training sessions on the scrub-the-hub intervention were organised for doctors and nursing staff at general medical wards.
- This QI project was carried out through the PDSA cycle.
- A **compliance audit** assessing staff compliance with important components of the scrub-the-hub intervention and an **electronic survey to assess the components in the COM-B model**, were utilised as the **process measures**.
- **Outcome measure was CLABSI rate per 100 admissions**. Target CLABSI rate was < 0.5/100 admissions.
- The data were analysed using descriptive statistics. Compliance rates and responses in the COM-B model were **stratified by professions (doctors vs. nurses) and years of working experience** to examine for any statistical difference or correlation using the Mann-Whitney U test and Pearson correlation.

Domain 1: Capability

- Correctly identify elements of scrub-the-hub intervention
- Correctly identify consequences of CLABSI
- Have forgotten to complete an element of scrub-the hub intervention in the past 4 weeks
- Unsure how to complete an element of scrub-the-hub intervention in past 4 weeks

Domain 2: Opportunity

- Difficult to find supplies required to perform scrub-the-hub intervention
- Difficult to get help to perform scrub-the-hub intervention
- Clinical care demands prevented completion of scrub-the-hub intervention in the past 4 weeks
- To be fully compliant to scrub-the-hub intervention is stressful
- To be fully compliant to scrub-the-hub intervention is difficult

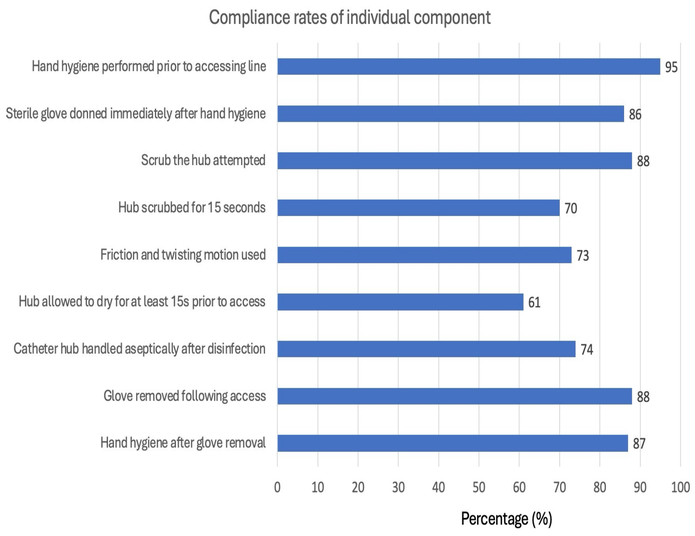
Domain 3: Motivation

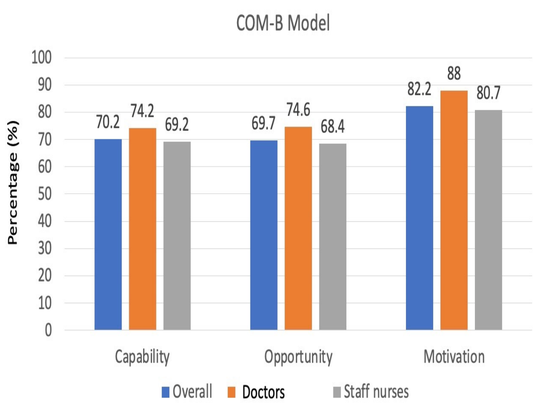
- Scrub-the-hub intervention is important part of my job
- Scrub-the-hub intervention is important for patient care
- Scrub-the hub intervention is important for hospital leadership (hospital KPI)

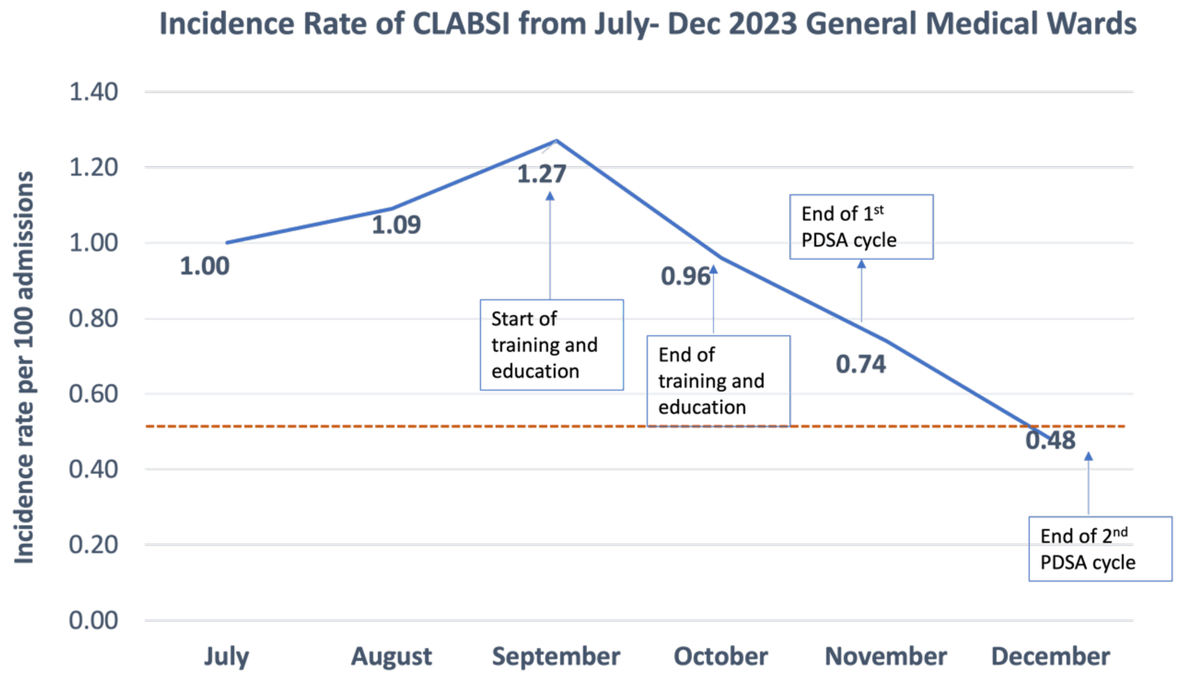
-Questionnaire sent to doctors and nursing staff members towards the end of each PDSA cycle to assess for each domain of the COM-B model

Results

- At baseline, the CLABSI rate at general medical wards was **1.27 per 100 admissions.**
- At the end of the first PDSA cycle, the CLABSI rate was **reduced to 0.74 per 100 admissions.**
- The **overall compliance rate was 59%.**
- There was no statistically significant difference in the compliance rates between doctors and nurses (p=0.699).
- There was **a positive correlation between compliance rates and the years of working experience among the nursing staff (r=0.685, p<0.001).**
- In the COM-B model, lower percentages were scored in the "capability" and "opportunity" domains.
- Targeted training focused on junior ward staff members, and measures to rectify issues identified in the COM-B survey were implemented, with more focus on "capability" and "opportunity" domains.
- At the end of the second PDSA cycle, the CLABSI rate was further **reduced to 0.48 per 100 admissions**, achieving the target of our QI project (<0.5/ 100 admissions).
- The **overall compliance rate improved to 76%.**







Conclusion

CLABSI rate can be reduced through the implementation of QI project.