Strategies to Reduce Central Line Bloodstream Infection Rate in Post Operative Cardiac Patients

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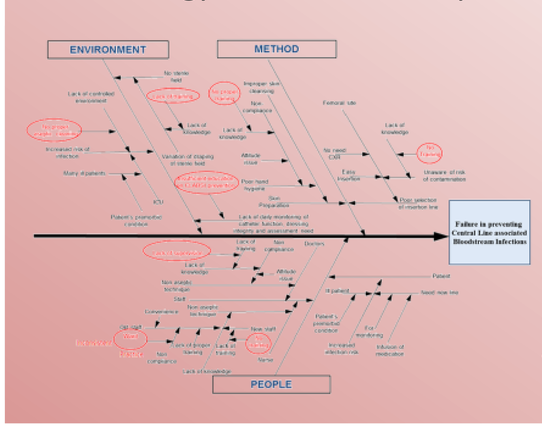
1. BACKGROUND

During cardiac surgery, a catheter is inserted into the patient's central vein to monitor his central pressure (CVP). It is essential that the CVP is accurately monitored as an abnormally high or low pressure can be life threatening and warrants immediate intervention. However, the use of these catheters disrupt the integrity of the patient's skin thereby making him susceptible to systemic infection with bacteria or fungi. Data from the Infection Control revealed that there was a surge of CLABSI incidents from January 2016 to September 2016. A total of 11 patients developed CLABSI during their stay in CTICU. Thus the team decided to determine the reason for this surge.

2. METHODOLOGY

A cross-functional team comprising of nurses from PACU, CTICU, CTOT, ICA, and IPC was formed for the project.

CLABSI incidents can result in prolonged hospitalization, and warrants the use of antibiotics with its adverse side effects and ultimately, increased healthcare cost. Although CLABSI bundle (to minimize CLABSI incidents) has been implemented in 2010, CLABSI incidents still occurred. The **Plan-Do-Check-Action (PDCA)** solving methodology was used to analyze the problem.



Using the cause & effect analysis, root causes identified include:

1. Lack of supervision for junior doctors during CVC insertion.
2. Inconsistent ward practice in dressing change.
3. Insufficient education of CLABSI prevention.
4. No proper aseptic cleansing of CVC site.

3. SOLUTIONS & INTERVENTIONS

Lack of supervision for junior doctors during CVC insertion.	•Junior doctor buddied and supervised by senior doctors during insertion of CVC •Modify existing checklist . It will serve as a ready guide for doctors and nurses
Inconsistent Ward Practice	•Give in service to new staff on the recommended frequency of CVC dressing change •Frequent reminder and roll call to staff
Insufficient education of CLABSI prevention	• Screen video on CLABSI prevention • Frequent reminder and roll call to staff on duty
No proper aseptic cleaning of the CVC site	• Ready to use disposable dressing set together with ready to use Chlorhexidine soaked swab stick for insertion of CVC • Ready to use Chlorhexidine soaked swab stick for change of CVC dressing

Additional protective dressing over the CVC insertion site.

BIOPATCH

- ✓**Protective disk containing chlorhexidine.**
- ✓**On application, it allows continuous release of chlorhexidine and gives 360º protection around the insertion site for 7 days**
- ✓**Provides ongoing antisepsis between dressing changes**

4. RESULTS

Modified Checklist

- Existing checklist was modified to include wearing of caps during CVC insertion
- New evidence based practices were incorporated into the checklist

Disposable Dressing Set

- Risks of contamination of the dressing set due to improper sterilization is eliminated
- Cost savings of $4 as the cost of sterilisation of the dressing set is higher than that of using a disposable dressing set

Chlorhexidine Swab Stick

- Sterile chlorhexidine soaked swab stick is for single and per patient use
- Risks of contamination through sharing of lotion is thus eliminated

Biopatch Disc

- Introduction of biopatch as a shield
- Last for 7 days
- Provides ongoing antisepsis coverage

ZERO CLABSI INCIDENCE

Before, we had an average of 15 CLABSI incidences reported annually. The multi-pronged approaches has help to eliminate CLABSI, which can potentially save hospital beds.

75 Hospital Bed Days saved annually!

CLABSI patients will typically extend their stay in CTICU for an average of 5 days. Every CLABSI incident prevented will lead to substantial manpower cost avoidance in attending to the infection.

Saved $4 per dressing change with disposable dressing set → **$5,066 annual cost savings**

Intangible Benefits

- ✓Improve patient's safety through reduction in hospital acquired infection
- ✓Staff satisfaction
- ✓Quality post-operative care

Doctors:
Junior/new doctors felt confident being mentored by senior doctors during the insertion of CVCs

Nurses:
Nurses were please that the project has increased their knowledge on the care and management of patients with CVC

Project Team:
Project promotes teamwork & collaboration among the doctors and nurses to reduce hospital acquired infection

CONCLUSION & PROJECT SPIN-OFF

- ❖New procedures have been standardized for staff to follow
- ❖Feedback obtained regularly from staff. Staff can seek clarification during roll calls or department meeting
- ❖Nurse clinician to speak to patients after each change of dressing to obtain feedback if they have experienced pain or discomfort
- ❖Team will conduct ongoing review to streamline the practices
- ❖With the reduction of CLABSI incidents in post cardiac surgical patients, we intend to share our initiatives with other institutions where patients with CVC insertion will be able to benefit