

IMPACT OF IMPLEMENTING MASTISOL IN CENTRAL LINE DRESSING CHANGES ON CENTRAL LINE ASSOCIATED BLOOD STREAM INFECTIONS IN PROGRESSIVE CARE UNITS: A QUALITY IMPROVEMENT PROJECT

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Abstract

Purpose: To observe the impact that Mastisol use on CVC dressings has on CLABSI rates on two progressive care units at The University of Kansas Hospital.

Context for the Project: There are nearly 5.4 CLABSIs per 1,000 line days nationally, leading to an 18% mortality rate and 14,000 unnecessary deaths per year. This Quality Improvement project addressed the need to improve CLABSIs to improve patient outcomes that influence hospitals' scorecards and Magnet status.

Activities Conducted for the Project: CLABSI rates were compared pre- and post-Mastisol implementation. Data were obtained through the Quality Team at The University of Kansas Hospital. Rates were compared pre-post implementation of Mastisol in a two-month period.

Results of the Project: In the pre-implementation phase, one CLABSI was reported. Zero CLABSIs were developed during the implementation of Mastisol timeframe.

Purpose, Background & Significance

Purpose: To evaluate the use of Mastisol in reducing CLABSI rates on two progressive care units at an academic medical center

Background & Significance:

Each year in the United States, there are more than 250,000 intravascular device-related blood stream infections, with the majority coming from central venous catheters (Safdar & Maki, 2003).

- Researchers have found that catheter dressing disruption is associated with an increase in catheter related infections (Timset et al., 2012).
- Mastisol may reduce the number of necessary central line dressing changes and in doing so reduce the number of central line associated blood stream infections (CLABSIs).
- Mastisol has been shown to keep six times the amount of dressings intact as the dressings secured with other typical adhesives such as benzoin (Lesesne, 1992).

Methods

The Plan-Do-Check-Act (PDCA) Quality Improvement Framework was used to guide this quality improvement study

Prior to this quality improvement project, Mastisol was used inconsistently among nursing staff despite it being available for staff to use during regular central line dressing changes.

Pre-implementation phase (Month 1): data were collected on CLABSI and dressing changes

During the implementation phase (Month 2):

- Nurses on Unit 64 and Unit 66 were instructed to use Mastisol with every central line dressing change for one month.
- Education was disseminated to the nursing staff by email from the Unit Educator and flyers posted by the Mastisol stock.
- Mastisol was physically attached to the central line dressing kits.
- The rates of CLABSI were compared pre- and post-implementation to determine if the implementation of Mastisol on every dressing change decreased the rates of CLABSI in the PCU patient population.



Mastisol was physically attached to each CVC dressing kit throughout the intervention phase (one month). Educational flyer was used for in-services and posted for nursing staff.

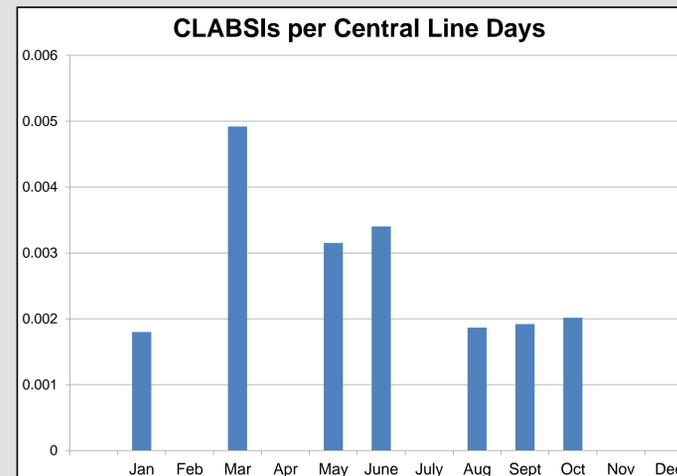
Results

Pre-implementation

- One CLABSI
- 496 line days
- Infection rate of 0.002 per central line day

Post-implementation

- Zero CLABSI
- 514 line days
- Infection rate of zero per central line day



Swab Caps Started House wide in September
Mastisol attached to Central Line Dressing Kits (Nov/Dec)

| Month | Central Line Days | Infections | Infections/Central Line Day | Interventions |
|-------|-------------------|------------|-----------------------------|------------------|
| Jan | 556 | 1 | 0.001799 | |
| Feb | 527 | 0 | 0 | |
| Mar | 610 | 3 | 0.004918 | |
| Apr | 572 | 0 | 0 | |
| May | 635 | 2 | 0.00315 | |
| June | 588 | 2 | 0.003401 | |
| July | 537 | 0 | 0 | |
| Aug | 536 | 1 | 0.001866 | |
| Sept | 521 | 1 | 0.001919 | SwabCaps Started |
| Oct | 496 | 1 | 0.002016 | Without Mastisol |
| Nov | 514 | 0 | 0 | With Mastisol |

Update to Project: Unit 64 & Unit 66 continue to use Mastisol with Central Line Dressing changes and collect data regarding impact on CLABSIs.

Conclusion

- Mastisol has demonstrated the ability to decrease the number of CLABSIs on two progressive care units.
- Multiple interventions including the addition of SwabCaps and increased effort to remove central lines quicker may have impacted the quality improvement data.
- The data collection needs to be continued to confirm Mastisol's impact in regards to CLABSIs.
- Financial analysis indicates that if just *one* CLABSI was prevented over the course of a year, the cost of Mastisol and Detachol for one unit would be covered plus an additional \$30,000 would be saved.
- If the continued use of Mastisol proves to have a positive impact, Mastisol should be included in the standard hospital central line dressing kits for all units.

Limitations

Sample Size

- Although this quality improvement project suggests that the utilization of Mastisol decreases incidents of CLABSIs, the sample size of the project proves to be a limitation.

Convenience Sampling

- Another limitation includes the utilization of convenience sampling of the patient populations on Unit 64 and Unit 66. These patients might not be representative population of all patients in the entire hospital.
- Both units are progressive care units whose patients are acutely ill yet able to ambulate around unit causing more line disruption than other patient populations.
- Patients who are in the intensive care units that are less mobile may not benefit as much from Mastisol. Immobile intubated patients may cause less line disruption than active patients that would exist on progressive care units.

References:

Lesesne, C.B. (1992). The postoperative use of wound adhesive. *The Journal of Dermatologic Surgery and Oncology*, 18(6), 990.

Safdar, N., & Maki, D. (2004). The pathogenesis of catheter-related bloodstream infection with noncuffed short-term central venous catheters. *Intensive Care Medicine*, 30(1), 62-67. doi: 10.1007/s00134-003-2045-z

Timset, J. F., Bouadma, L., Ruckly, S., Schwebel, C., Garrouste-Orgeas, M., Bronchard, R., Lucet, J. C. (2012). Dressing disruption is a major risk factor for catheter-related infections. *Critical Care Medicine*, 40(6), 1707-1714.