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Preventing CRBSI'S in Hemodialysis

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PREVENTING CRBSI'S IN HEMODIALYSIS

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Purpose Statement

The aim of this project was reducing CRBSI's below the predicted number of bloodstream infections with the implementation of the ClearGuard® chlorhexidine-based antimicrobial disinfecting cap.

Synthesis of Evidence

Two large clustered-randomized trials have proven that ClearGuard® caps can reduce CRBSI by 56-69% (Hymes et al., 2017; Brunelli et al., 2018).

In the 13 months of the Brunelli et al., (2018) study, BSI rates decreased significantly with the use of the ClearGurad® caps (0.28 versus 0.75 PBCs per 1000 CVC-days respectively; P=0.001)

My DNP Project

1 clinic
3 months
54 patients

Using the ClearGuard® caps were associate with a **56% decreased rate of BSI when compared to the use of standard caps**. During the last 6 months of the study, use of the ClearGuard® caps were associated with a **69%** lower BSI (Hymes et al., 2017). **SUSTAINED USE = BETTER OUTCOMES**

Team Members

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Pre/Post Measures

Pre-implementation audits (prior 3 months)

206 patients, 49 patients with a tunneled catheter and 2 access related BSI's.
1 BSI was attributed to a fistula,
And 1 BSI was attributed to a graft.

0 BSI's were attributed to a catheter.

Post-implementation audits (my project-3 months)

186 patients, 54 patients with a tunneled catheter.

0 BSI's were attributed to a fistula, graft, or catheter during this time period

(Table 2).

Access related BSIs (ARBSI) per access type	3-Months Prior Implementation Rate (# of events/# of pt months)	3-Months Post Implementation Rate (# of events/# of pt months)
All	0.97 (2/206)	0.00 (0/186)
Fistula	0.79 (1/127)	0.00 (0/108)
Graft	3.7 (1/27)	0.00 (0/21)
Other Access (Port, Hybrid)	Not applicable	0.00 (0/3)
Tunneled Central Line	0.00 (0/49)	0.00 (0/54)
Non-tunneled Central Line (PICC if pt has tunneled dialysis central line)	0.00 (0/3)	Not applicable
Any CVC	0.00 (0/52)	0.00 (0/54)

*ARBSI rate calculated by taking # of ARBSIs divided by pt months; then multiplied by 100

Results were not unexpected...**EXTENDED** use of the ClearGuard® cap proves to decrease CRBSI by 56-69%. The Hymes (2017) study showed the last 6 months of use: infection rates of 0.18 (3rd qtr.) and 0.26/1000 CVC days (4th qtr.) compared to the first six months at 0.33/1000 days for both the 1st and 2nd quarter. Limitations encountered were time and a small sample size. A three-month time frame did not allow enough time to adequately assess for improvement of CRBSI's and using one single hemodialysis unit and not all 12 outpatient units associated with this organization was also another limitation. Using more dialysis units would have given a much larger sample size.

References

Brunelli, S. M., Van Wyck, D. B., Njord, L., Ziebol, R. J., Lynch, L. E., & Killion, D. P. (2018). Cluster-randomized trial of devices to prevent catheter-related bloodstream infection. *Journal of the American Society of Nephrology: JASN*, 29(4), 1336-1343. <https://doi.org/10.1681/ASN.2017080870>

Hymes, J. L., Mooney, A., Van Zandt, C., Lynch, L., Ziebol, R., & Killion, D. (2017). Original investigation: Dialysis catheter-related bloodstream infections: A cluster-randomized trial of the ClearGuard HD antimicrobial barrier cap. *American Journal of Kidney Diseases*, 69220-227.

Evidence-Based Practice Change

Currently use: Tego® connector. Research of a 70% isopropyl disinfecting cap placed over the Tego® connector not as superior compared to the ClearGuard® cap



ClearGuard® cap uses a dry form of chlorhexidine antimicrobial disinfectant. The cap is placed on the ends of the hemodialysis catheter at the end of each treatment and remains in place between treatments to provide continuous disinfection.

ClearGuard® caps can reduce CRBSI by 56-69%



After completion of my project, based on all data available, the senior organization of this project unit decided to implement the ClearGuard® cap throughout their entire hemodialysis population

This includes 12 hemodialysis units, totaling 405 patients, with 119 catheters within their organization.

Reduction of CRBSI will have beneficial impacts on healthcare organizations and this patient population