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9-2020

Examining Blood Culture Contamination Rates using MaxZero Needleless Connectors

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Comparison of Blood Culture Contamination Rates and CLABSIs Following Implementation of Central Venous Catheter (CVC) Needleless Connector Changes According to Manufacturer's Guidelines

BACKGROUND / SIGNIFICANCE

- Patients with a CVC are at high risk for central line associated blood stream infections (CLABSIs). Every access of a CVC, including needleless connector changes, places patients at increased risk. Current practice per PAMC policy is to change the needleless connectors prior to every blood culture to minimize contamination, citing the Infusion Nurses Society (INS) as reference for this practice. The INS does not differentiate between products from different manufacturers.



- An estimated 30,100 CLABSIs still occur in U.S. acute care facilities annually despite targeted education & practice changes such as bath-in-a-bag, CHG bathing, and eliminating pink basin use in patient care areas.
- PAMC PICU/PEDS CLABSI rate remains higher than the national average reported to NDNQI (0.81-1.31).

PURPOSE

- To determine whether changing the MaxZero™ needleless connector on a central line every seven days per manufacturer recommendation affects CLABSI and/or blood culture contamination rates on the inpatient pediatric unit and PICU. This new practice will essentially eliminate changing the connector before every blood culture draw.
- Four Aims:** (1.) Create education plan incorporating current nursing knowledge, (2.) Implement new change in practice, (3.) Compare blood culture contamination and CLABSI rates pre / post intervention, (4.) Determine if final data supports change in policy.

METHODS

- Design** – Quality improvement project with pre-, post-intervention; analyzed with descriptive statistics
- Sample** – Target population included all inpatient PICU and Pediatric patients at PAMC with CVC in place > 48 hours; patients were newborn to 21 years of age; total of 30 beds
- Interventions** – Developed step-by-step instructions, fliers, & videos with QR code and provided this education at staff meetings, unit change of shift safety huddles, and just-in-time training for (1.) blood culture collection process & (2.) new practice - ONLY changing needleless connectors Q7 days
- Data collection** – Rounded with staff to ensure correct processes utilized and complete documentation performed; manual chart audits, CLABSI surveillance, & data abstraction by lab for blood culture contamination rates

Needleless Connector Changed:	N = 32	N = 22
Before 7 days	1	4%
At 7 days	19	86%
After 7 days	2	9%
De-accessed, discharged, or removed before 7 days	10	

REFERENCES

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- MaxPlus™ clear needleless connector. (2019). BD. <https://www.bd.com/en-uk/products/infusion/iv-therapy/needle-free-systems-and-connectors/maxplus-clear-needleless-connector>

RESULTS

- During the 3.5-month intervention period, 34 blood cultures were drawn from a CVC. No CLABSIs or contaminated blood cultures were identified. These results are compared to pre data from 2017 and 2018 where 261 and 247 blood cultures were drawn, respectively. With 1 contaminated blood culture and 0 CLABSIs in 2017 and 2 contaminated blood cultures and 4 CLABSIs in 2018. Nurses documentation in the EMR suggested compliance with the new protocol.

	2017	2018	10/1/19 – 1/11/20
Total blood cultures drawn	261	247	34
Contaminated blood cultures	1	2	0
Number of CLABSIs	0	4	0

IMPLICATIONS FOR PRACTICE

- Although there are several limitations, primarily the small sample size, the CNS council voted to allow pediatrics to change policy to match manufacturer recommendations and may implement future studies to further validate this practice hospital wide.

CONCLUSION

- The absence of CLABSIs or contaminated blood cultures suggests that the lengthened interval of changing the needleless connector can be incorporated into nursing practice; however, continued monitoring is warranted to maintain patient safety.