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Reducing the Central Line Associated Blood Stream Infection Rate in Cardiovascular Operating Room Patients

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Background

Current literature suggests “central line-associated bloodstream infections (CLABSI) remain one of the deadliest healthcare-associated infections” (Barnes, Rearden, & McHugh, 2016). They contribute to an increase not only in consumption of resources and extended hospital stays, but also an increase in mortality and morbidity.

The Centers for Medicare and Medicaid Services (CMS) no longer reimburses hospitals for the cost of treating these infections. CLABSI’s are a focus of both the CMS and the Magnet recognition program and they are a nurse–sensitive indicator that reflect the quality and impact of nursing care.

The Cardiovascular Operating Room (CVOR) at Providence St. Vincent Medical Center in Portland, Oregon (PSVMC) is a magnet designated tertiary care center that inserts upwards of 900 central line catheters per year. After zero CLABSI events in 2016, a total of 4 events in 2017 among CVOR patients raised concerns regarding adherence to a standardized practice for central line catheter insertion.

Evidence suggests that a reduction in CLABSI can be achieved by adhering to standardized preventive measures of evidence-based (EB) recommendations. A review of the literature also suggests that educational intervention should be regularly implemented to address gaps in practice and ensure the use of EB prevention intervention.

Purpose

PICOT Question: In CVOR patients receiving central line venous access, how does standardizing sterile technique for preparation and insertion affect insertion bundle compliance rates and CLABSI rates over a three month period?

Methods

A four week observation period was initiated to determine staff members’ (registered nurses, anesthesia assistants and anesthesiologists) level of compliance to recommended practice. The nine observed practice elements included using Chloraprep surgical skin prep while wearing a long sleeved unsterile jacket and sterile gloves, prepping the puncture site for 30 seconds and then widening the field, allowing a three minute dry time according to the manufacture’s specifications, hand hygiene performed by both anesthesiologist and nurse/assistant prior to donning sterile attire, draping using a full body drape, maintaining sterility of the pulmonary artery (PA) catheter during insertion, application of biopatch and tegaderm dressings.

After observing 21 PA catheter insertions, a 10 point survey was administered to the staff to determine their level of knowledge of best practice for assisting with central line insertion.

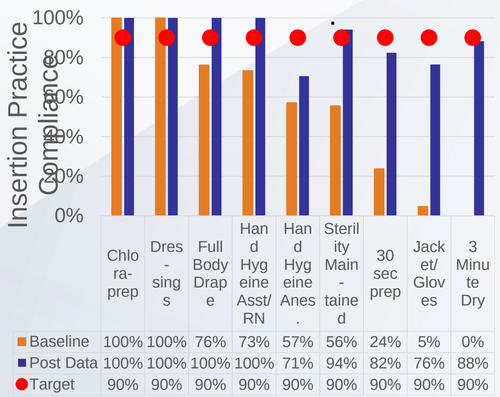
Multiple educational sessions were offered to address observed deviations from recommended practice. They were:

- Application of Chloraprep per manufacturer specifications
- Maintaining sterile technique during central line insertion
- Standardization in practice regarding hand hygiene, skin prep, sterile attire, maximum barrier precautions, maintaining sterile field and dressing choice and application.

• Devising improved work flow to accommodate best practice.

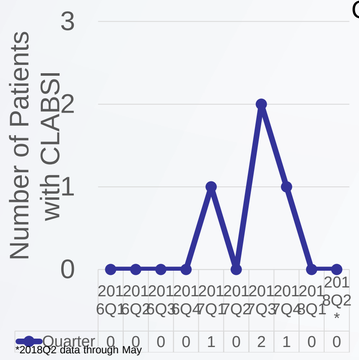
A four week time frame was given to incorporate the new work flows into practice, followed by four weeks of post intervention observation.

Compliance with Central Venous Catheter Insertion EBP



	Chlora-prep	Dres-sings	Full Body Drape	Hand Hygeine Asst/RN	Hand Hygeine Anes.	Sterility Main-tained	30 sec prep	Jacket/ Gloves	3 Minute Dry
Baseline	100%	100%	76%	73%	57%	56%	24%	5%	0%
Post Data	100%	100%	100%	100%	71%	94%	82%	76%	88%
Target	90%	90%	90%	90%	90%	90%	90%	90%	90%

Number of CLABSI Events 2016-2018



Results

Observation of 21 pre-intervention central line catheter insertions revealed significant deviation (overall score of 54%) from recommended practice by both new and existing staff and also by anesthesia staff. The 10 question survey related to knowledge of recommended practice revealed an average score of 80%.

Observations of 17 post-intervention central line catheter insertions revealed a significant improvement in compliance (overall score of 90%) with a standardized method of preparing for central line insertions. Four of the nine practice elements scored 100% while improvements on the remaining five practice elements ranged from 14%-88%. Over an eight week timeframe all practice elements that originally scored less than 100% showed improvement. The goal of a 90% compliance rate was achieved on five out of nine practice elements.

Zero post-intervention CLABSI were documented.

Discussion/Conclusions

Although the 10 point survey revealed that the staff had a reasonable level of knowledge regarding standard practice for central line insertion, the staff did not demonstrate strict adherence to the recommended practice. After educational sessions were provided, there was a significant improvement in adherence to best practice.

In order to accommodate recommended practice, new work flows needed to be established and put into place. This change in routine was initially disruptive but after a several week transition period there was full cooperation from most team members. The ability to influence disciplines other than our own can be challenging.

Post intervention data collection will continue through the end of 2018. Follow-up educational sessions will be provided if any of the practice elements fail to show continued improvement. There will be a follow up 10 question survey at the end of 2018.

Education contributes to increased compliance with evidence based practice when assisting with central venous catheter insertion. Patients who receive care that is evidence-based are at a lower risk for CLABSI. There have been no post-intervention CLABSI documented for CVOR patients.

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