CLABSIs in the PICU: The importance of a maintenance care bundle approach

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1 Background

This project is a one month review of central line usage and Central Line Associated Blood Stream Infections (CLABSIs) in the Pediatric Intensive Care Unit (PICU) within the Bloomberg Children's Center.

The current maintenance bundle approach within the Bloomberg Children's Center is similar to the Institute for Healthcare Improvement bundle introduced in 2010. The bundle includes:

- Daily assessment of line necessity
- Daily assessment of line dressing
- Maintenance care of central line entry sites
- Protocols for dressing changes, cap (at catheter hub) changes, tubing changes, and implanted port needle care

Central lines are prevalent in acute care settings, and this project is extremely beneficial to quality care and patient safety within the PICU population.

- 40,000 central line-associated bloodstream infections occur annually (adult & pediatric)
- CAUTIs typically cause a prolongation of hospital stay, increased cost, and increased risk of mortality
- PICUs have the third and fourth highest rates among 16 unit types

Working with Infection Control, this project sought to analyze central line usage data and CLABSI rates for the month of January 2013, compare values to January 2012, and create a document to publish within the unit about the findings.

2 Methods

This retrospective analysis included data retrieval from electronic medical records of patients who were admitted to the PICU in January 2013.

Data was gathered on the following parameters:

- Type of central line
- Age of central line
- Central line insertion site
- Daily chlorhexidine bathing (Y/N)

Data was provided by Infection Control about positive CLABSIs during 2013.

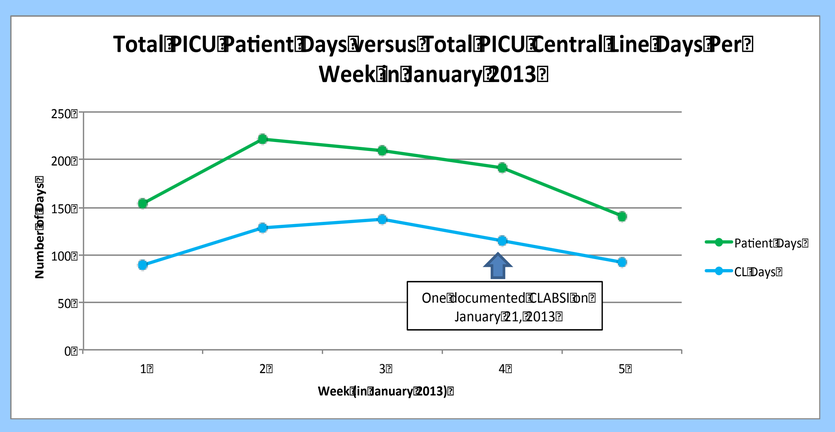
The data was then compared to January 2012.

3 Results

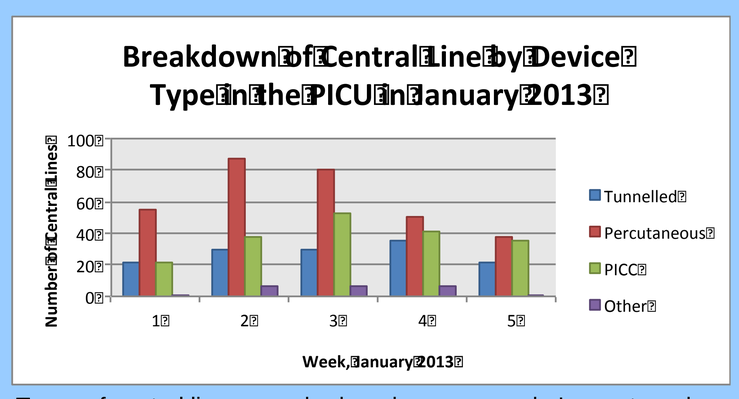
The data collected from electronic medical records for January 2013 was separated into an analysis of total central line days and breakdown by type of central line.

Throughout January 2013, there were a total of 919 patient days and 559 central line days. There were 141 tunneled line days, 308 percutaneous line days, 192 PICC days, and 23 other central line days.

These numbers increased from January 2012, where there were 717 patient days and 294 central line days (weekly and device type analyses were not available).



PICU patient days are comprised of the number of patients in the PICU per day, per week, in January 2013. Total central line days include the patients in the PICU per day, per week, with the presence of a central line. There was one CLABSI during the month of January 2013.



Types of central lines were broken down per week. In most weeks, there were more percutaneous lines (short-term, non-tunneled) than other types. "Other" types of central lines included umbilical lines in neonates.

Percutaneous lines are more commonly inserted in the PICU patient population because of their short-term use. With patients that are acutely ill and in need of advanced medical intervention, there are certain medications and treatments that cannot be delivered intravenously. Longer term devices such as tunneled lines are primarily reserved for chronically ill patients.

According to results from Infection Control, there were zero CLABSIs in January 2012. The increase in central line days between 2012 and 2013 could be explained by difficult venous access for PICU patients, patients more acutely ill, medication requirements (central opposed to intravenous), among other factors. This increase in central line days may also be a contributing factor to the one positive CLABSI in January 2013.

4 Conclusions

The data analysis of January 2013 was compared to the data provided from the PICU and Infection Control from January 2012.

The nurse-driven care bundle for central line maintenance has significantly decreased the number of CLABSIs in the PICU patient population.

There was one positive culture in January 2013, which is a 0.002% increase from 2012. If this one CLABSI was within experimental error, the current bundle still shows an effective decrease in CLABSI rates among the PICU population.

A more comprehensive analysis of central line usage and CLABSI prevention would be a device utilization ratio, which was not completed during this study.

By continuing to implement the nurse-driven care bundle for central line maintenance, we can:

- Decrease the number of CLABSIs
- Decrease mortality rates
- Save more healthcare dollars

5 Future Directions

This data will be utilized in the following ways:

- A report for PICU staff about central line days and documented CLABSIs in January 2013 will be published with CLABSI prevention tips
- Data analysis for the remaining months of 2013 will be completed and published for staff reports

6 References

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