

Title:

Implementation of Education to Insert PICC at Bedside: Insertion Attempts, Cost, and Interventional Radiology Utilization

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Abstract Summary:

To determine whether formal annual training in PICC placement will reduce the number of PICC line insertion attempts, cost, and need for Interventional Radiology utilization. We will conduct a retrospective chart review before the educational program was initiated and prospective chart review post training program to determine infant outcomes.

Learning Activity:

LEARNING OBJECTIVES	EXPANDED CONTENT OUTLINE
The learner will be able to identify common uses for peripherally inserted central catheters in neonates	Used for the administration of parental nutrition, hyperosmolar solutions, prolonged antibiotic treatment, and vasoactive medications. It is recommended that patients who require more than 6 days of therapy, be considered for central access.
The learner will be able to identify when PICC placement is necessary	Peripheral intravenous insertion (PIV) can be difficult to maintain for long periods with increased risk of infiltration, resulting in repeated need for replacement. Multiple PIV insertions increase the amount of exposures to painful procedures
The learner will be able to identify assistive devices used for vascular access	Assistive devices such as ultrasound, transillumination and infrared vein visualization may help identify potential access points
The learner will be able to identify the importance of a designated team for PICC placement and formal annual education	We hypothesize that formal annual training of dedicated providers in PICC line placement will increase the frequency of bedside insertion, decrease the number of insertion attempts, reduce cost and decrease utilization of interventional radiology.

Abstract Text:

BACKGROUND

Children’s Hospital of Wisconsin is a state of the art, Level IV, 70 private bed neonatal intensive care unit that cares for more than 750 infants every year. Approximately 175-200 peripherally inserted central catheters (PICC) are placed each year due to the health status and complex health needs of our patient population.

PICCs are used for the administration of parental nutrition, hyperosmolar solutions, prolonged antibiotic treatment, and vasoactive medications. It is recommended that patients who require more than 6 days of therapy, be considered for central access.

Peripheral intravenous insertion (PIV) can be difficult to maintain for long periods with increased risk of infiltration, resulting in repeated need for replacement. Multiple PIV insertions increase the amount of exposures to painful procedures. On the other hand, once a PICC line is placed it can be maintained throughout the desired treatment course. Infants with PICCs are exposed to less peripheral insertions which reduces exposure to painful, thus negative stimulation.

Formal training, including both didactic and clinical component, is recommended for obtaining and maintaining vascular access. Assistive devices such as ultrasound, transillumination, and infrared vein visualization may help identify potential access points.

Using a dedicated PICC team decreases multiple insertion attempts, improves outcomes, decreases infection rates, decreases placement time and is associated with decreased cost. It is suggested that the total cost of a PICC placed in IR can be more than 40% higher than placement done by an advanced practice nurse or trained NICU provider.

STUDY TITLE

Implementation of education to insert peripheral central catheters (PICC) at the bedside: insertion attempts, cost and interventional radiology (IR) utilization.

PURPOSE OF THE STUDY

The purpose of this study is to determine whether formal annual training in PICC line placement of a dedicated group of providers will reduce the number of PICC line insertion attempts, cost, and need for Interventional Radiology (IR) utilization for PICC placement. We will conduct a retrospective chart review of 350 infants admitted to the NICU between 2014 and 2015 before the educational program was initiated and prospective chart review of 500 infants post training program to determine infant outcomes pre and post training.

HYPOTHESIS / SPECIFIC AIMS

We hypothesize that formal annual training of dedicated providers in PICC line placement will: 1) increase the frequency of bedside insertion, 2) decrease the number of insertion attempts, 3) reduce cost and 4) decrease utilization of interventional radiology.

Aim 1. To determine if implementation of didactic education for providers will improve successful bedside placement of PICCs from September 1st, 2016 through December 31st, 2018 (or until 500 infants post-educational program has been achieved) via prospective chart review.

Aim 2. To determine if formal annual training and hands on education with placement devices (ie. transilluminator devices and ultrasound) will decrease insertion attempts by evaluating pre education insertion attempts to post education insertion attempts.

Aim 3. To determine whether implementation of formal annual training using simulation will reduce patient costs, through increased amount of PICC placement at bedside, which is bundled in the NICU daily charge versus an additional cost for an IR placed PICC.

Aim 4. To determine if formal annual training results in a reduction in IR utilization (at bedside in NICU or in IR suite) by evaluating number of consults to IR for PICC placement.

Design and Methods

As a participant of the Maternal-Child Health Nurse Leadership Academy (MCHNLA) through Sigma Theta Tau, in partnership with Johnson & Johnson, I have strengthened my leadership skills and collaborated with my triad (Fellow, Mentor and Faculty Advisor) to implement a project in the NICU which will improve outcomes for our tiniest patients and further enhance my ability to effectively lead a team.

For this project, data will be collected from the infant's electronic health record (EPIC) and NICU database provided by the medical director of the NICU to evaluate the number of peripherally inserted central

catheters placed at bedside by a trained provider or by IR (at bedside or in IR suite) from January 1st, 2014 through December 31st, 2018 (or until 500 infants post-educational program has been achieved). Data will be entered directly into a Microsoft Excel spreadsheet with an associated key for patient identifiers that will be password protected and stored on an Aegis secure key jump drive. Any identifiable paper data will be kept separately from the aegis secure jump drive and will be located in the department of nursing research office which is badge access only and in a locked file cabinet.

Formal training to be completed on an annual basis in July or August for all new providers that place PICCs in the NICU (ie. neonatal NPs, neonatal fellows and neonatal attendings). Clinical instruction and hands on education would be the responsibility of the Neonatal Nurse Practitioner team. Formal training to be scheduled based on number of attendees, availability of conference room and equipment. There is no fee associated with the class. This is not a PICC certification class, however, providers would demonstrate competency and be evaluated through a pre/post test.

Inclusion criteria: Any infant who had a peripherally inserted central catheter placed at Children's Hospital of Wisconsin from 2014-2018.

Exclusion criteria: Neonates with peripherally inserted central catheters placed at outside institution at time of admission.

IRB approval was obtained from Children's Hospital of Wisconsin for study.

RESULTS/OUTCOME

Given recent IRB approval, data collection and statistical analysis are currently underway for the retrospective data from 2014-2016. Results for pre-intervention (education) data will be available and presented via poster at time of STTI convention. Post-intervention data will be collected until December 2018 and then be analyzed. For those interested in the final data and study results, contact information will be provided.

CONCLUSION

We hope to prove that formal annual training of dedicated providers in PICC line placement will increase the frequency of successful bedside insertion, decrease the number of insertion attempts, reduce overall patient cost and decrease utilization of interventional radiology.