Implementation of Education to Increase Successful Peripherally Inserted Central Catheter (PICC) Placement at the Bedside

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Introduction

- Children’s Hospital of Wisconsin (CHW) is a Level 4 pediatric hospital with a 69-bed neonatal intensive care unit that cares for more than 700 infants every year.
- Peripherally inserted central catheter (PICC) placement is very common in the population we serve due to the critically ill nature and complex health needs of our patients.
- 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.
- In 2015, the PICC Team placed 168 PICCs successfully at the bedside (74% success rate) and 59 patients required PICC placement in Interventional Radiology (IR) (26% of PICCs).
- In 2014, the PICC Team placed 145 PICCs successfully at the bedside (76% success rate) and 46 patients required PICC placement in Interventional Radiology (IR) (24% of PICCs).

Rationale

- 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 exposure 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.

Aims

1. Implementation of didactic education for providers that place PICCs (NNPs, fellows, neonotologists and residents) including clinical PICC workshop and hands on education with placement devices (i.e. transilluminator devices and ultrasound)
2. Evaluate success and attempt rates for bedside and IR placed PICCs from January 1st, 2014 through August 31st, 2016 (pre-education) and September 1st, 2016- December 31st, 2018 (post-education)
3. Measure reduction in IR utilization

Strategies/Activities

- **Identify key stakeholders**
  - CHW central access team
  - NNP team/NNP manager
  - Senior leadership
  - Conduct baseline data analysis (2014/2015)
    - Conducted a chart review of infants admitted to the NICU between January 31st, 2014 and August 31st, 2016 before the educational program was initiated and infants post educational program to determine if there was a change in infant outcomes with the new approach.
  - Provider education
    - Establish education and training on current available devices/products at CHW
    - Complete clinical education PICC workshop for providers
    - Formal equipment training
    - Formal anatomy education
- **Practice change**
  - Documentation modification
  - Change readiness survey
  - Pre/post tests
  - Monthly team meetings
  - Work with physician support to change PICC template in EPIC to incorporate: device used (i.e transilluminator, vein viewer, ultrasound, non)
    - Time to placement
    - Number of attempts

Projected Outcomes

- Evaluate success rate, attempt rate and time of placement
- Assess IR utilization
- Track unplanned adverse outcomes
- Evaluation utilization of ultrasound
- Implement yearly education

Acknowledgements

- Argon Medical Devices for sponsoring our Workshop for Peripherally Inserted Central Catheters in the Neonate
- Elizabeth Li Sharpe, DNP, ARNP, NNP-BC, VA-BC
- Dr Mike Uhing, Physician Champion
- CHW NNP Team