

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

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Background

Children's Hospital of Wisconsin (CHW) is a Level 4 pediatric hospital with a 70 private bed neonatal intensive care unit that cares for more than 750 infants every year.

PICCs are used for:

- administration of parenteral nutrition
- hyperosmolar solutions
- prolonged antibiotic treatment
- vasoactive medications

Peripheral intravenous insertion (PIV) can be difficult to maintain for long periods with increased risk of infiltration, resulting in repeated need for replacement and exposure to painful procedures. A PICC line can be maintained throughout the desired treatment course

Formal clinical and didactic training recommended to obtain and maintain vascular access

Assistive devices for placement include: ultrasound, transillumination, and infrared vein visualization

Total cost of a PICC placed in IR can be more than 40% higher than PICC placement done at the bedside

Purpose

To determine whether formal annual training in PICC line placement of a dedicated group of providers will reduce the number of PICC line insertions attempts, cost and need for Interventional Radiology (IR) utilization for PICC placement

Hypothesis

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, 4) decrease IR utilization

Aim 1. To determine if implementation of didactic education for providers will improve successful bedside placement of PICCs from 9/1/16 through 12/31/2018 (or until 500 infant post-educational has been achieved).

Aim 2. To determine if formal annual training and hands on education with placement devices will decrease insertion attempts by evaluating pre-education insertion attempts compared to post-education

Aim 3. To determine whether implementation of formal annual training using simulation will reduce patient costs, through increased amount of PICC placement at bedside versus placement by IR

Aim 4. To determine if formal annual training results in reduction of IR utilization

Project Methods/Measures

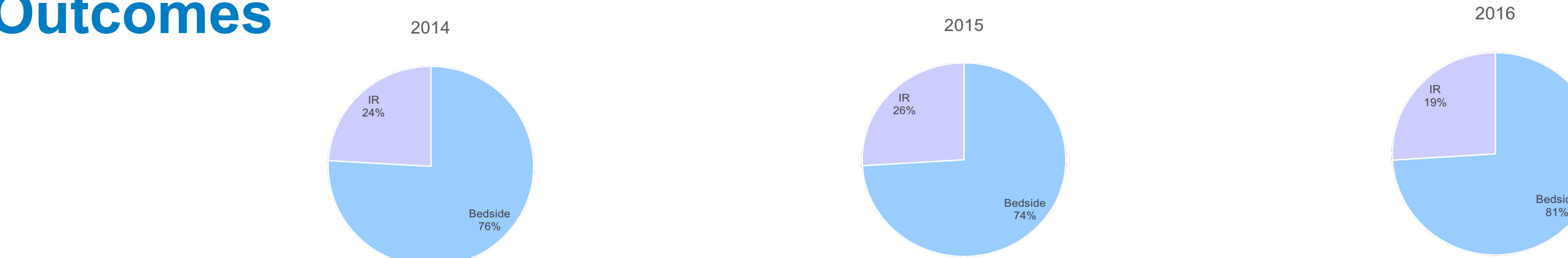
- **Identify key stakeholders**
NNP team/NNP manager
Neonatology MDs, fellows and residents
Department of Interventional Radiology
CHW senior leadership
CHW central access team
- **Provider education**
Implementation of didactic education for providers
Clinical PICC workshop and hands on education
Training with placement devices
-transilluminators, ultrasound, vein viewer
- **IRB Approval**
Not human research; QI project
- **Monthly team meetings**
- **Practice change**
Change readiness survey
Pre/post tests
Documentation modification
Work with physician support to change PICC template in EPIC to incorporate: device used; placement time; number attempts
- **Data**
Conduct retrospective chart reviews of 350 infants admitted to the NICU to evaluate attempt and success rates for bedside and IR placed PICCs from January 1st, 2014 through August 31st, 2016 (pre-education)

Conduct prospective chart reviews of 500 infants admitted to the NICU to evaluate attempt and success rates for bedside and IR placed PICCs from September 1st, 2016- December 31st, 2018 (post-education)

My leadership journey

- **Model the way**
 - Participated in and utilized concepts introduced by the STTI academy workshops
 - Positively presented challenge to team
- **Inspire a shared vision**
 - Garnered administrative support
 - Presented a preliminary outline of project and goals at PCFEF in July 2016
 - Facilitated PICC education class with support from Argon and instructed by Liz Sharpe (8/17)
- **Challenge the process**
 - Met with key stakeholders throughout CHW to obtain support for project
 - Pre/post test completed related to formal education for PICC placement
 - IRB submitted and approved in 2017
- **Enable others to act**
 - Fostered collaboration
 - Shared best practices
- **Encourage the heart**
 - Presented posters at 2016 NANN conference, 2016 CHW Pediatric conference, 2017 SWANN conference, 2017 WAPC conference and 2017 STTI conference

Outcomes



- **Organization**
 - Cost savings to both organization and patients with reduction in IR utilization
 - Decrease attempts made AFTER implementation of education
 - Most providers used device for bedside placement
- **Patient/Parent Satisfaction**
 - Decreased need for additional medication for PICC placement
 - Decreased pain due to decreased insertion attempts
- **Provider comments after class**
 - "As someone just learning how to place PICCs, the discussion about the best insertion place was helpful"
 - "I will refer to the step by step guide and feel more prepared to troubleshoot with line insertion"
 - "I learned many tricks and techniques to improve success with placement"
 - "Review of anatomical structures and placement was very helpful"

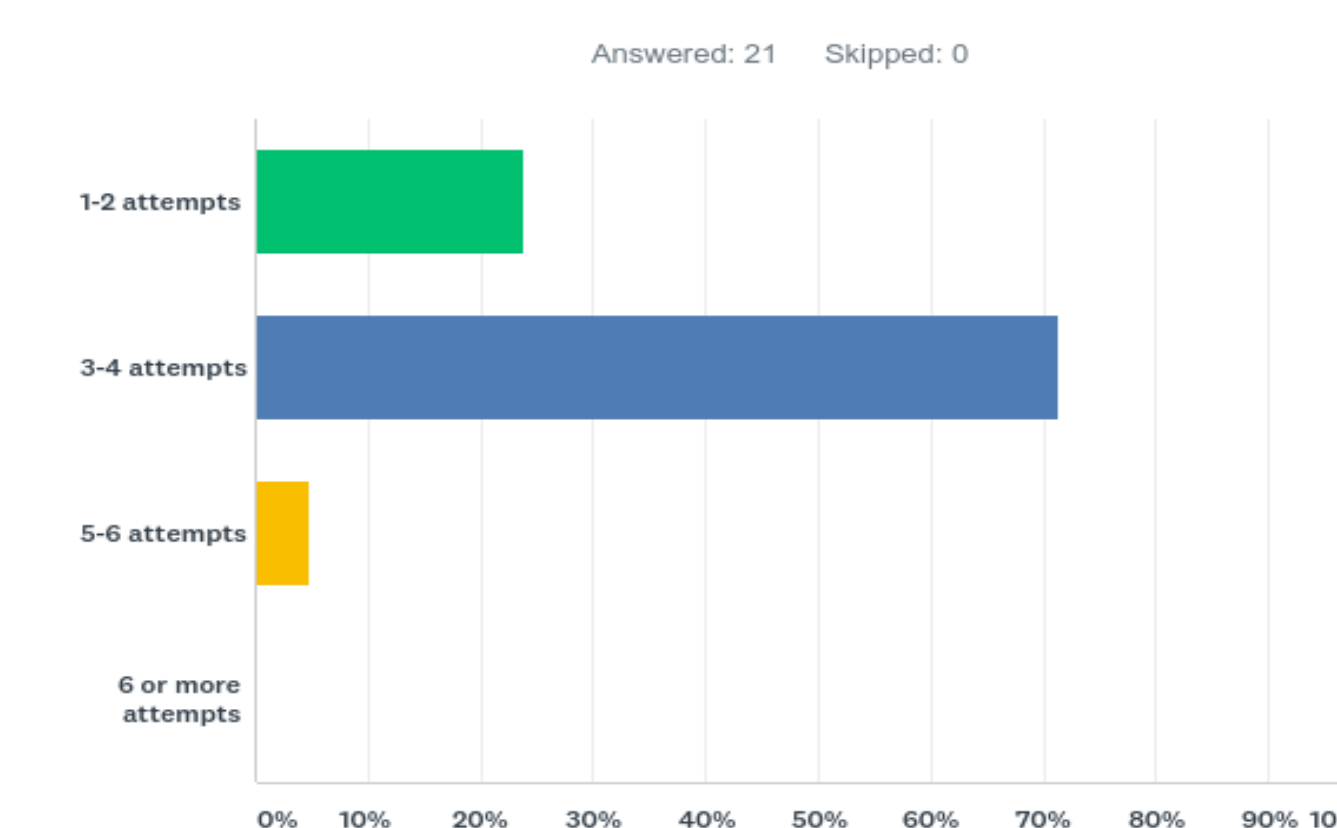


Discussion

- implementation of education does increase successful placement at the bedside while decreasing IR utilization
- Further studies are needed to evaluate the other factors (ie. CGA, wt, diagnosis) for PICC placement by IR



Q2 On average, how many attempts will you make before you consider your attempt unsuccessful?



Acknowledgements

- Beneficiaries: 638 infants, 30 physicians, 26 NNPs, 260 NICU nurses and countless parents and family members
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