

Development of a Real-Time Vascular Access Dashboard: A Quality Improvement Initiative to Understand Use of Vein Visualization Technology and Enhance Patient Care

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Purpose

- Identify vein visualization technology usage by the Vascular Access Team (VAT)
- Develop and implement a vascular access dashboard to track outcomes in real-time and improve patient care

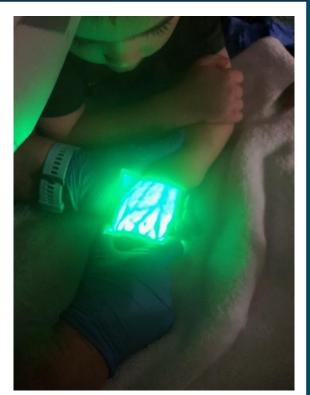


Figure 1. NIR being used for vein assessment and as a distraction technique

Background

Peripheral intravenous catheter (PIVC) placement is a frequent and complex procedure

>300 million PIVCs placed annually in the U.S. with average of 2.18-2.35 attempts per procedure¹⁻³

First attempt success rates are low in children

 Children are considered one of the most challenging populations due to vein depth, inability to immobilize easily, and fewer optimal sites for cannulation⁴

Vein visualization technology can improve care

- Vein visualization technology, such as near infrared (NIR – Figure 1), is recommended for pre-insertion assessment by the Infusion Nurses Society (INS) and the Association for Vascular Access (AVA)⁴⁻⁸
- Vein visualization technology can decrease time to cannulation, reduce costs, improve care and improve patient/family satisfaction⁹⁻¹²

Implementation

- Retrospective data were extracted and analyzed to establish current PIVC practices including technology utilization rate
- A data collection sheet (Figure 2) was used and a two-step cluster analysis was conducted

Results

 Data analysis revealed that several important data points were not documented routinely or were missing (ex: reason for removal, number of attempts prior to escalation to VAT)

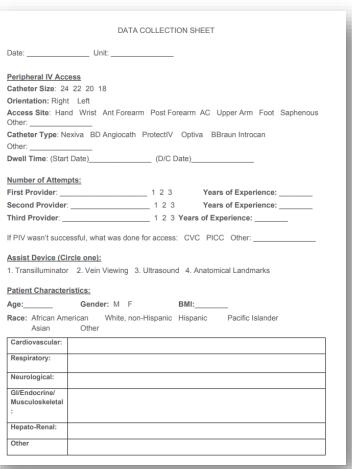
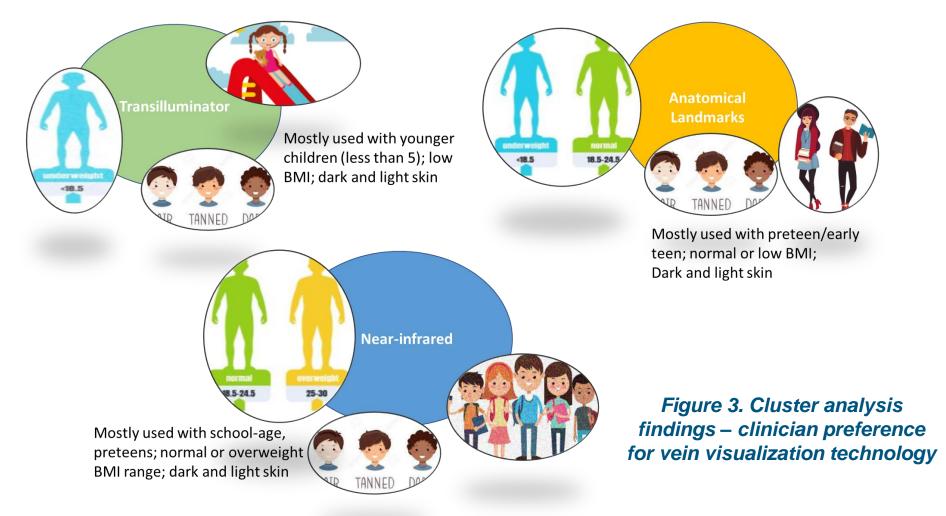


Figure 2. Data collection sheet

 Exploratory cluster analysis revealed valuable findings regarding clinician preference for each method depending upon patient characteristics (Figure 3)





Results contd.

 The initiative also resulted in the development of a vascular access dashboard (Figure 4), which is now used to track real-time data on PIVC insertions, escalations, dwell time, reason for removal, etc.

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Figure 4. Vascular Access Dashboard

Conclusions / Future Directions

- Results provided a deeper understanding of PIVC placement practices and usage of vein visualization technology in this large pediatric hospital
- The VAT Nurse Manager and team use the dashboard to monitor trends, and gather clinically relevant insights to improve PIVC placement and care
- Phase 2 seeks to collect prospective data, including the missing datapoints, to evaluate the impact of vein visualization technology on patient outcomes.

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