



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

Figure 2. Data collection sheet

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

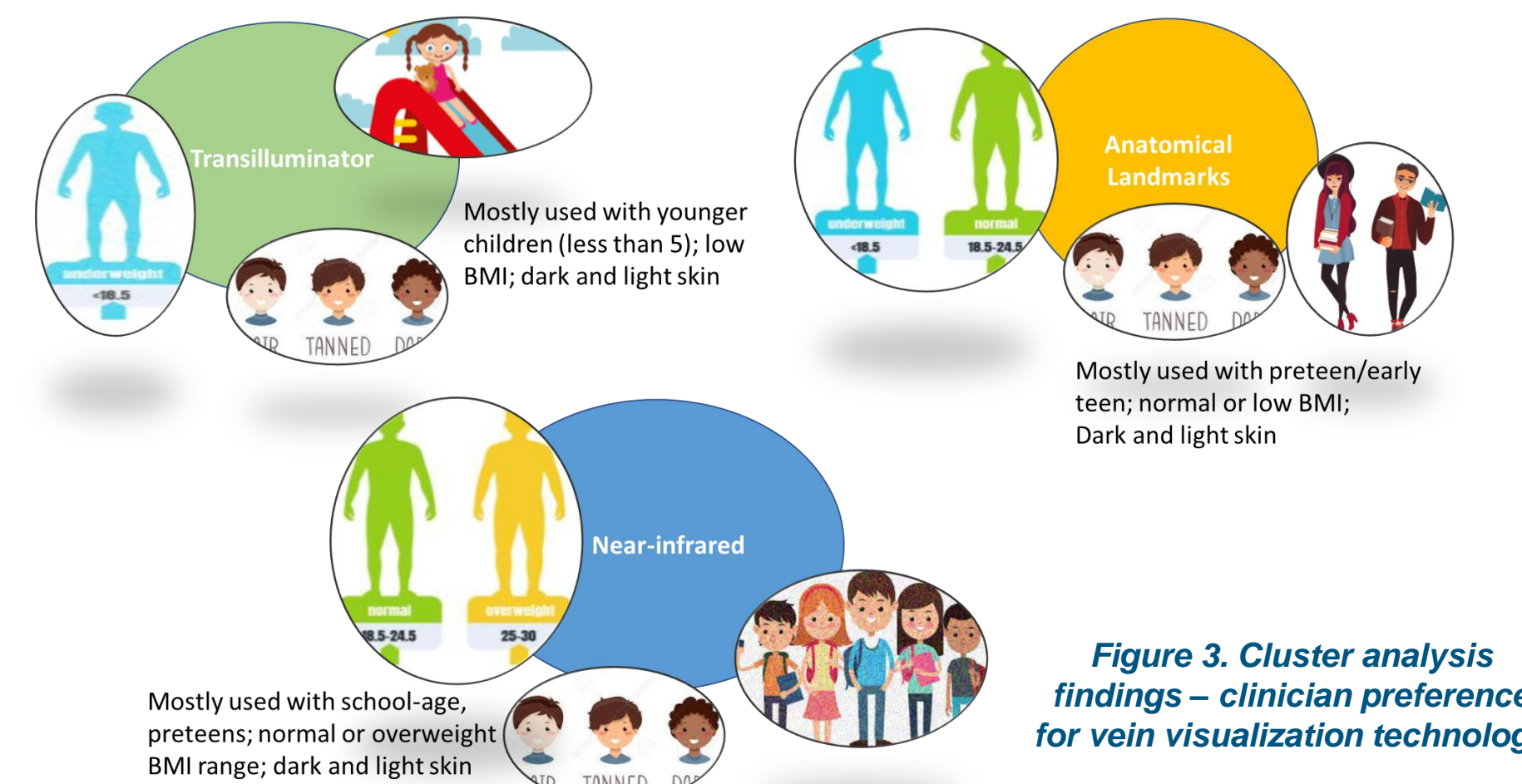


Figure 3. Cluster analysis findings – clinician preference for vein visualization technology

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.

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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Based in Fort Worth, Texas