

Background

Over 300 million peripheral intravenous catheters (PIVCs) are placed annually in the United States, making it the most frequently performed medical procedure.^{1,2}

Multiple attempts increases risk of complications for patients

An average of 2.18-2.35 attempts are required to place a single PIV.³ Patient characteristics, and provider confidence and experience, influence the likelihood of success.⁴ Repeated attempts lead to increased use of resources and greater risk of venous depletion, nerve damage, paresthesia, hematomas and arterial puncture⁵

Vein visualization technology can improve care

Vein visualization technologies, such as near infrared (NIR), can improve PIV access and care by decreasing the number of attempts and time to successful placement, especially in patients with potentially difficult PIV access.⁶⁻¹² Yet, adoption of this beneficial technology is limited. This quality improvement initiative implemented NIR technology to improve peripheral intravenous catheter (PIVC) placement in oncology and nephrology patients who were likely to have difficult intravenous access (DIVA). Staff were equipped with NIR technology and provided with education on NIR-guided PIV site assessment and PIVC placement.

Purpose

The purpose was to evaluate the impact of a quality improvement initiative, which combined education and technology, on PIVC placement and care.

Effectiveness of Near-infrared Vein Visualization Technology in Patients with **Potentially Difficult Intravenous Access** Leslie Aldridge BSN, RN; Annette Beckham MSN, RN; Eddie Hobbs BSN, RN

Implementation / Methods

Staff in an oncology and nephrology unit were equipped with a NIR device (AV500, AccuVein Inc., Newton, MA) and educated on using the device for PIV site assessment and PIVC placement. A survey was administered to nurses using NIR (n=55) for PIVC placement and compared with nurses not using NIR (n=41). Outcome measures included first attempt success and usability of the NIR device. The survey included questions on the 🥏 🔅 (number of attempts at PIVC \bigcirc placement and the A-DIVA score for each patient.

Results – What were the findings?

A 20% increase in first attempt success rate was found in the NIR group (72.7%, n=40) vs the No NIR group (51.2%, n=21), and this was statistically significant (P = .035).

For patients categorized as moderate risk on the A-DIVA scale (n=36) a 65% increase in first attempt success rate was found in the



NIR group (82.6%, n = 19) vs the No NIR group (15.4%, n = 2), and this was also statistically significant (P < .05).



PIVC PLACEMENT USING NIR PIVC PLACEMENT WITHOUT NIR

Most participants (92.3%, n=24) reported that the NIR device was helpful and had good usability in terms of improving PIVC placement skills.

This quality improvement initiative highlighted the impact of NIR vein visualization technology on first attempt success in an oncology and a nephrology unit. First attempt success was significantly higher using NIR vein visualization technology, especially in patients with a moderate A-DIVA score. NIR vein visualization technology is a valuable clinical tool that can improve PIVC access when used routinely for preinsertion assessment and placement – especially with those considered to be difficult to access.

Further data collection is needed to validate and expand upon the findings established with this initiative.

Click here to view references

Results Contd.



Conclusions

Future Directions

McLeod Health The Choice for Medical Excellence