Implementation of Near-Infrared Technology (AccuVein AV-400®) To Facilitate Successful PIV Cannulation

Elaine D. Delvo Favre, MSN, RN, RN-BC (Principal Investigator)
Gale Daneti, PhD, RN, NE-BC (Co-Investigator)
Peggy Guin, PhD, ARNP, CNS-BC, CNRN (Co-Investigator)

Abstract
Research has shown that the use of vein illumination devices facilitate non-emergent IV placement, however, studies are limited and have not included multiple populations nor evaluated staff perception of device utility and satisfaction.

A research study using a near-infrared vein illumination device (AccuVein AV400®) was conducted to evaluate the utilization of central resource staff (code team, PICC nurses and flight nurses) to meet the PIV access needs of the adult and pediatric unit patient populations. Pre and post implementation measures of staff perception on device utility also were obtained.

One of the outcome measures for this study included the number of escalation calls to central resources. Data on escalation calls were collected for two months prior to introducing the device on six nursing units (two pediatric, two adult med surg, one intermediate care, and one ICU). After one month “acclimation period”, data on escalation calls were again collected for two months. Staff on the study units were initially surveyed about their IV practices regarding venous cannulation and need for call escalation. Following device implementation for the two month intervention period, the staff was surveyed about IV practices using near-infrared technology (AccuVein AV400®) to visualize vasculature and its impact on their ability to successfully cannulate veins.

Results showed a 45% decline in escalation calls following device implementation with 91% of nurses reporting likelihood to use device prior to escalating call. The survey of nurses’ perceptions of the impact from device use showed significant satisfaction with 93% successful cannulation within 1-2 attempts. Study results indicate the use of near-infrared vein illumination technology may be beneficial to incorporate as a standard of practice for peripheral venous cannulation.

Objective
• Describe the impact of device use in successful vein cannulation
• Discuss the effect of device utility on staff satisfaction
• Identify the benefits of device use on decreasing central resource utilization.

Methods
• Pre and post implementation staff survey
• Pre and post data collection on “escalation calls” to central resources

Results
• 45% decline in escalation calls following device implementation
• 81% reported improved ability to cannulate
• 93% successful cannulation within 1-2 attempts
• 65% of nurses reported IV expertise as “competent” or “very competent”
• 61% of nurses reported greater than 3 years of nursing experience

Conclusions
Near-infrared technology vein illumination device (AccuVein AV400®) improved venous cannulation.
• Availability of near-infrared technology appears to increase staff’s confidence in attempting vein cannulation.
• Additional research study needed to determine other factors impacting successful venous cannulation, e.g., time, unit resources, nurse’s skill and patient factors.