

VeinLite Transillumination in the Pediatric Emergency Department, a Therapeutic Interventional Trial

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BACKGROUND: In a pediatric emergency department (ED), the insertion of a peripheral intravenous line (IV) can be a difficult experience for patients, parents and medical providers. IV placement in infants, toddlers, and children with chronic medical conditions necessitates increased dexterity. If unsuccessful, either less optimal routes are used or more invasive access is attempted.

OBJECTIVE: Our hypothesis was that transillumination would increase IV success rates in pediatric ED patients under 3 years of age and in those with a history of difficult access. We studied IV insertion by pediatric ED nurses and emergency medicine fellows, using the VeinLite (TransLite). Our primary outcome was success rate of IV placement in 1 attempt and our secondary outcome was success rate in 2 attempts.

DESIGN/METHODS: We enrolled children less than 3 years of age who presented to Children's Hospital Boston ED and required elective IV insertion. Also, we included those 3 to 21 years of age with a chronic illness who were previously identified as having difficult access. Participants were randomly assigned to VeinLite transillumination or standard of care. Exposure and possible confounder data was collected until final outcome. Analyses were performed using random effects logistic regression adjusting for provider effect.

RESULTS: 240 patients were enrolled. Adjusting for safety catheter ($p=0.008$), visibility ($p=0.01$) and palpability ($p=0.03$), those randomized to use of Veinlite were significantly more likely to be successful on the first attempt, $p=0.03$ (O.R. 2.1 (95% CI 1.1-3.9)). Intracluster correlation (ICC) for random effect of provider was 10%. For the secondary outcome, adjusting for safety catheter ($p<0.001$), location ($p=0.005$), and palpability ($p=0.05$), those randomized to Veinlite were significantly more likely to be successful on the first or second attempt, $p=0.01$ (O.R. 3.5 (95% CI 2.2-5.6)). The ICC for random effect of provider was 16%

CONCLUSIONS: Our results indicate a benefit in the use of VeinLite transillumination for peripheral IV insertion in first attempt and within two attempts. This technique facilitates IV placement.