

Success in IV Cannulation Study

Near-Infrared Light Device Can Improve Intravenous Cannulation in Critically Ill Children

THE HIGHLIGHTS

Introduction

- Vascular access in critically ill children is a challenge
- Factors such as age, skin color, anxiety and comorbidities can affect successful cannulation.
- Failure to establish lines increases patient anxiety and frustrates nursing staff.

Purpose of the Study

- To compare first attempt success rate and time for insertion attempts of peripheral IV catheters between those placed with and without the assistance of VeinViewer.

Outcome Measures

- Mean time to find the first available vessel, first attempt success rate, median attempts per patient and total time of attempts per patient.

IN SUMMARY:

Vascular access is one of the most frequent procedures performed on patients and is used for delivering fluids and medications during their hospital stay. Though being performed frequently, even experienced staff may have trouble with certain patients; those who are young, have dark skin and are anxious about the procedure are particularly challenging. These challenges can bring about increased anxiety and pain for patients and can be frustrating for the nursing staff charged to their care.

In this study, VeinViewer®, a device that uses near-infrared light to project a vascular “road map” onto a patient’s skin, was compared with the authors’ standard vascular access methodology to determine if the device would change first attempt success rates.

Sixty (60) patients between ages 3 months and 17 years were randomized 1:1 to either the VeinViewer or standard practice group. There were no differences between the groups in terms of their demographic data. Five (5) nurses with vascular access experience ranging from 1-12 years were assigned to perform the IV cannulation in both groups. The nurses were asked to record the time required to find the first available vessel, total number of attempts needed to achieve success, and the total time needed to complete the procedure.

The results of the study showed that VeinViewer significantly improved mean time to find the first available vessel and the total time of attempts per patient.

The study also showed a highly significant improvement in attempts per patient for the VeinViewer group. Lastly, first attempt success rate trended positive and close to significance.

To understand how their study successes could impact the cost effectiveness, the authors determined that in their 20 bed ward they had the potential to save close to \$530 per month by using VeinViewer.

This study proves that VeinViewer provides hospitals increases in operational efficiency and a solid return on investment.

	Outcome Measure	VeinViewer Group	Control Group	% Improvement (p-value)
Results	First attempt success rate	56.7% (17/30)	33.3% (10/30)	70% (0.059)
	Median attempts per patient (range)	1 (1-5)	2 (1-5)	100% (0.004)
	Mean time to find the first available vessel (s)	126.37 ±26.33	383.61 ±112.14	67% (0.027)
	Total time of attempts per patient (s)	186.16 ±38.82	497.23 ±123.31	63% (0.014)

Conclusion

Use of VeinViewer for vascular access in critically ill children can improve first and overall stick attempt rates in addition to decreasing total medical time and cost.

Ref: Sun C-Y, et al., Near-infrared Light Device Can Improve Intravenous Cannulation in Critically Ill Children, Pediatrics & Neonatology (2013)