

# Vein Illumination: What are the benefits?

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## Overview

Vascular access has long been one of, if not the most, common procedure in health care. Every year there are upwards of one billion<sup>1</sup> venipunctures performed in the United States. As a long time nurse, I have experienced first hand the difficulties and stresses involved with vascular access. Due to my experiences with vein illumination, I have become a huge proponent of the technology. In my facility we have seen an increase in first attempt success rates in both easy and difficult patients which has led to a decrease in unnecessary PICC lines and an increase in patient satisfaction. I have compiled my findings along with other research I have found in an attempt to raise awareness for what I feel is a great technology.

## Luminetx<sup>®</sup> Vein Viewer<sup>™</sup> Vs. AccuVein AV300

The Vascular Illumination market currently has two devices available, the Vein Viewer by Luminetx and the AV300 by AccuVein. Both devices provide the user with an illumination of a patients vasculature, which allows the user to have sight of where they are going to stick before they actually stick it.



	Vein Viewer	AV300
Size	~ 6 ft. 130 lbs	10 oz. <sup>5</sup>
Price	~\$25,000 <sup>2</sup>	\$4,500
Calibration Required	Yes	No
Power Supply	110 volt outlet	Rechargeable Battery
Ease of Use	Difficult- size	Easy- Portability, Point and Click use
Image Display	Takes picture of vasculature and projects the image on to the skin	Real time image from infrared light and lazer
Depth of Image	up to 8mm <sup>3</sup>	up to 7mm <sup>6</sup>
Accuracy of Image	.06mm from original position <sup>4</sup>	.04mm from original position <sup>7</sup>

1. "...one billion..." Grable HO, Gill GW. Phlebotomy puncture juncture: preventing phlebotomy errors- potential for harming patients. *Laboratory Medicine*. 2005; 36(7): 420-433
2. "Will the VeinViewer Make the Blind Stick A Historical Footnote?" *Clinical Correlations*. <http://www.clinicalcorrelations.org/?p=110>
3. *Ibid*
4. "Diomed Announces Shipment of First VeinViewer Imaging Systems" *Business Wire*. Wed., May 3, 2006
5. [www.accuvein.com](http://www.accuvein.com)
6. Information Gathered from AccuVein
7. *Ibid*

# The Benefits of Vein Illumination

## Increase First Attempt Success Rate

When evaluating Vein Illumination I found that increasing the success rate on first sticks was a factor that drove all the other advantages of the technology. Based on my research the average number of attempts per patient using the traditional method can range anywhere from 2.5 to 6 attempts in children.<sup>8</sup> One study of Vein Illumination technology found that using the traditional method on 48 patients their mean number of attempts was 2.08, which was a first attempt success rate of 31%. When using the Vein Illumination technology they saw the mean number of attempts fall to 1.18 and the first attempt success rate rise to 83%.<sup>9</sup> Another found similar results with their mean number of attempts falling from 1.97 to 1.28 and their first attempt success rate rise from 49.3% to 80%.<sup>10</sup> Moreover, at my facility we saw the mean number of attempts fall from 1.94 to 1.52 (this was mostly on difficult sticks) and the first attempt success rate raise from ~39% to ~76%.

## Decrease Unnecessary PICC Lines

My facility, like most, has a 2 attempt rule. Meaning, if I am unable to gain vascular access in my first two attempts another nurse or doctor has to take over. Furthermore, if a peripheral IV is not achieved, more highly trained staff and more costly procedures, such as PICC lines, are required. The graph to the right shows how quickly these costs can add up.

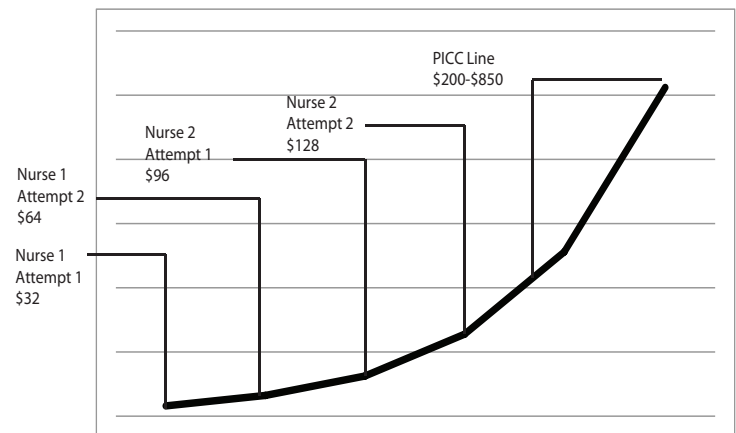
## Increase Patient Satisfaction

In my opinion, this is the greatest benefit of vein illumination technology. Press Ganey scores are a factor that drives the success of numerous health care facilities across the country. A study on this technology saw patient satisfaction scores rise from 1.85 (very unsatisfied) to 4.07 (satisfied). Again, my facility saw very comparable result rising from a 2.31 to a 4.17.

## Conclusion

The benefits that I have listed above are only a few of the many upsides to Vein Illumination Technology. Many of the other benefits I did not touch on because they are too difficult to quantify; increased care giver confidence through the ability to have sight for a procedure that has always been based on feel is one of these benefits. As I stated before, I feel this is a technology that should be invested in, and should become a standard of care in the health care industry.

*Cumulative Cost of Escalation*



*It is estimated that each attempt at a peripheral IV costs ~\$32.*

8 "Clinical Ops" Study done by Luminetx 2008

9 "Vein Viewer Data Trial" study done by SSM Cardinal Glennon Childrens Medical Center. 2008

10 "Wolfson Study: Innovative Technology Produces 80% First Stick Success Rate" 2008



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