

# ***Clinical Implications and Financial Impact of Difficult Venous Access***

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## Assessing the Costly Impact of Difficult Venous Access

The challenge of placing a peripheral IV catheter (PIVC) in a patient with difficult venous access or DVA is faced by clinicians in every aspect of healthcare — emergency room, hospital, ambulatory surgery center, physician's office, long-term care centers and home care. In addition to the stress and anxiety for the patient caused by repeated attempts to place a PIVC, needed medications are delayed for extended periods of time. Healthcare organizations incur the costs of additional supplies, clinician time and delayed procedure schedules. The clinical and financial impact of difficult venous access to healthcare organizations and patients from recent publications is summarized below:

- Initial PIVC insertion success rate for staff nurses is in the range of 44% – 65%. <sup>1, 3, 9, 13</sup>
- Based on numerous studies, it takes on average 2.2 painful sticks to place a peripheral IV catheter. <sup>9, 16, 17, 18</sup>
- Multiple placement attempts are associated with an increased incidence of extravasation, vascular perforation causing hematoma or hemorrhage, phlebitis and pain. <sup>9, 13</sup>
- Needle stick is rated as one of the most distressing parts of hospitalization as fear activates the sympathetic nervous system and can produce peripheral vasoconstriction in both adults and children. <sup>9, 14, 15</sup>
- The median time to start a PIVC is 20 minutes with placements requiring multiple sticks consuming the most personnel time and cost with the expense of nursing and other personnel representing up to sixty percent of total costs. <sup>2, 3, 11, 19</sup>
- The average cost of PIVC placement on first stick is \$32 but quickly escalates with multiple attempts to over \$125 or 4x the cost. <sup>11, 17, 20</sup>
- Current inappropriate use of PICCs — solely due to inability to place a PIVC — shows that 18% – 30% are not required by prescribed therapy ultimately driving increased cost. <sup>6, 7, 21</sup>
- Rate of major complications with PICCs was observed in 22.6% of patients while only 3.4% with PIVC patients and average cost of complication management at \$300 – \$350 for each case further adding to the cost of PICC use. <sup>8</sup>
- Struggles with obtaining and maintaining IV access too often adversely affect a patient's overall hospital experience. <sup>10</sup>
- Vein visualization technology can significantly improve first stick success up to 100%, reduce PICC line placement up to 30% and significantly increase patient satisfaction.
- Based on the body of clinical evidence, INS – Infusion Therapy Standards of Practice state, "Vein visualization technology is used in patients with difficult venous access ... and employed to increase the success with peripheral cannulation and decrease the need for central vascular access device (CVAD)..."

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## Financial Impact of Difficult Venous Access

IMPROVED FIRST STICK SUCCESS:				SAMPLE *		
		National Ave. Supply Cost per IV Attempt: <sup>4</sup>	National Ave. Cost of Clinician Time Required: <sup>2,3</sup>	Annual PIVC Placed:	Access Costs:	Total Access Costs:
<b>Traditional Access:</b>				10,000		
Traditional Stick See & Palpate 1st Stick Success: <sup>1,2</sup>	65%	\$8.04	\$15.00	6,500	\$149,760	
Difficult Venous Access See & Palpate 2nd Stick Success: <sup>1,2</sup>	22%	\$16.08	\$30.00	2,200	\$101,376	
Difficult Venous Access See & Palpate 3+ Stick Success: <sup>1,2</sup>	13%	\$24.12	\$45.00	1,300	\$89,856	
<b>Total Traditional Access Costs:</b>						<b>\$340,992</b>
<b>VeinViewer® Access:</b>				10,000		
Informed Site Selection VeinViewer 1st Stick Success: <sup>1,2</sup>	65%	\$8.04	\$15.00	6,500	\$149,760	
Difficult Venous Access VeinViewer 1.3 Stick Success: <sup>5</sup>	35%	\$10.45	\$19.50	3,500	\$104,832	
<b>Total VeinViewer Access Costs:</b>						<b>\$254,592</b>
<b>A. Potential Annual Savings with VeinViewer Implementation:</b>						<b>\$86,400</b>
<b>REDUCED PICC LINE PLACEMENTS</b>						
		PICC Supply Cost: <sup>8</sup>	PICC Insertion Time Cost: <sup>8</sup>	Annual PICC Placed:	Access Costs:	Total PICC Access Costs:
<b>Traditional Access:</b>				500		
PICC Prescribed Based on Therapy: <sup>6,7</sup>	80%	\$210.00	\$480.00	400	\$276,000	
PICC Placed Due to Difficult Venous Access: <sup>6,7</sup>	20%	\$210.00	\$480.00	100	\$69,000	
<b>Total Traditional Access Costs:</b>						<b>\$345,000</b>
<b>VeinViewer Access:</b>				500		
PICC Prescribed Based on Therapy: <sup>6,7</sup>	80%	\$210.00	\$480.00	400	\$276,000	
Difficult Venous Access VeinViewer 1.3 Stick Success: <sup>5</sup>	20%	\$10.45	\$19.50	100	\$2,995	
<b>Total VeinViewer Access Costs:</b>						<b>\$278,995</b>
<b>B. Potential Annual Savings with VeinViewer Implementation:</b>						<b>\$66,005</b>
<b>Total Potential Annual Savings with VeinViewer Implementation (A+B):</b>						<b>\$152,405</b>
Total VeinViewer Vision2 Units for Deployment						10
Nursing Units		VeinViewer Vision2		8		
Emergency Department		VeinViewer Vision2		1		
Perioperative Services		VeinViewer Vision2		1		
Average VeinViewer Vision2 Cost						\$17,995
<b>Total Projected Cost of VeinViewer Implementation</b>						<b>\$179,990</b>
Return on Investment Period (months)						14
<b>C. Total Annual Cost Savings After ROI Period:</b>						<b>\$152,405</b>

\*Data represents average 200 bed acute care hospital.

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