

Clinical Effect of the Neutron™ Needlefree Catheter Patency Device in Reducing PICC Line Occlusions and Cath-Flo™ Usage in a Teaching Hospital

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BACKGROUND

It is estimated that well over 7 million central venous access devices (CVADs) are placed each year in the United States.¹ The proper care, maintenance, and avoidance of complications in these indwelling devices is essential for viable IV access for therapies such as chemotherapy, antibiotic therapy, total parenteral nutrition, and the infusion of blood and blood products.

Catheter occlusion is a common complication in the use of CVADs, with as much as 25% of all central venous catheter usage ending in occlusion.^{2,3} The majority of occlusions occur as a direct result of thrombosis,⁴ which, in turn, is linked to increased risk of catheter-related bloodstream infections (CRBSIs) for patients. Approximately 250,000 incidents of CRBSIs occur annually in the United States⁵ each adding an estimated \$34,508 to \$56,000^{6,7,8} cost per case.

PURPOSE

Lancaster General Hospital (LGH), a 623-licensed bed teaching facility in Lancaster, Pennsylvania, has adopted various strategies to address catheter occlusion, including standardization of flush requirements (amount, solution, and frequency) for vascular access devices and the use of a positive displacement device, CLC2000™ (ICU Medical Inc.).

In FY 2012, the LGH IV team placed, on average, 120 peripherally inserted central catheters (PICCs) per month (FY 2012=1,432). Each month, an average of 30 interventions was required to restore patency to occluded catheters. This was accomplished through the use of Pharmacy & Therapeutic Committee's policy on Cath-Flo Activase™ (Genentech USA) administration. Seeking to avoid the need for this clotting agent and its associated costs, LGH investigated the use of the Neutron™ Catheter Patency Device (ICU Medical Inc.) to prolong catheter patency and reduce the average monthly intervention rate for Cath-Flo administration.

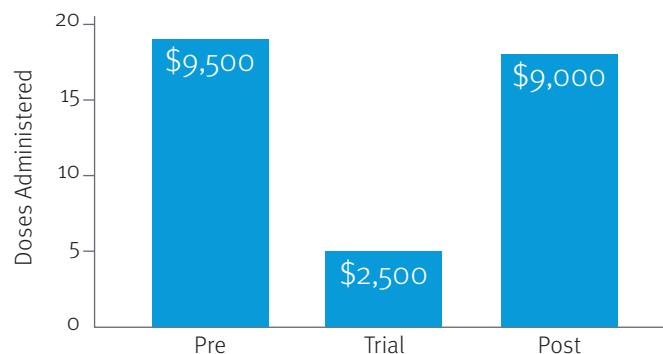
METHODS

Data was collected on Cath-Flo administration rates for three separate three-week periods documenting Cath-Flo use pre-, during-, and post-trial of the Neutron device. The facility used 200 Neutron connectors during the intervention period. On the first day of the trial, all inpatient PICCs received new Neutron devices.

RESULTS

In the pre-trial period, 19 doses of Cath-Flo were administered to restore patency to occluded catheters. During the three-week Neutron trial period, the number of Cath-Flo doses administered—including one given for a non-occlusion issue—dropped to five doses. When the Neutron devices were removed, the number of Cath-Flo administrations increased to 18 during the three-week post-trial period. Assigning a \$500 cost to each of the Cath-Flo administrations, the LGH results indicated a potential to reduce costs by 74%, saving in excess of \$6,500 per month.

GRAPH 1: ESTIMATED t-PA COSTS* PRE, DURING, AND POST NEUTRON TRIAL



* \$500 Nurse Charge used by facility as a benchmark figure to determine costs. Not necessarily indicative of actual charge of drug and administration costs.

CONCLUSION

Although basic in design, the trial data suggests that the Neutron Catheter Patency Device provided superior performance when compared to a positive displacement valve, resulting in a 74% reduction in Cath-Flo interventions.

In the two months subsequent to the completion of the trial, LGH documented 58 Cath-Flo interventions: 27 in November and 31 in December with costs of \$13,500 and \$15,500, respectively.

TABLE 1: PATENCY RESTORATION AND DEVICE REPLACEMENT COST SAVINGS COMPARISON*

	CLC 2000	Neutron
Cost of tPA Administration	\$74,160.00	\$37,080.00
Device cost @ 7 per Line (21 days)	\$791	\$24.50
Total Device Cost	\$10,170.00	\$31,500.00
Total Cost	\$84,330.00	\$68,580.00
tPA Cost Savings/Year Using Neutron		\$15,750.00

* Based on \$206 per Cathflo dose - 360/yr intervention rate and 50% reduction using Neutron

Extrapolating for estimated annual performance, a comparison of costs with and without Neutron, based on the trial data, suggests that LGH would realize a \$15,750 (19%) reduction in costs. Cost avoidance benefit may be significantly greater assuming that the reduced incidence of occlusion lowers the risk of costly CRBSI.

References

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