Anti-reflux Technology Reduces Catheter Complications and Provides Significant Cost Savings

2014 Infusion Nurses Society Poster Presentation

Julie Shomo BS, BSN, CRNI, VA-BC • Carla Reynolds BSN, CRNI, VA-BC • Aliva Gilbert BSN

Ephraim McDowell Medical Center - Danville, KY • Kindred Hospital Central Ohio - Mansfield, OH

INTRODUCTION

Health care professionals are now tasked with providing better patient outcomes while reducing the monetary resources in which to support these outcomes. Catheter occlusion caused by blood reflux-related thrombosis not only delays therapy, monopolizes valuable nursing time, and increases risk of other complications, but also creates a negative financial impact by increasing tPA and catheter replacement costs.

Because the relationship between catheter thrombosis and infection is significantly documented, reducing blood reflux and catheter occlusion is now a priority. Anti-reflux technology in needleless connector form may provide a way to minimize the blood reflux that occurs not only when a syringe is removed, but at any time that the connector is in place.

This study examines two facilities choosing to use an anti-reflux needleless connector in place of their current devices with no other changes in practice. The study highlights both clinical outcomes and cost savings for each facility. Ephraim McDowell Medical Center is a 222-bed acute care hospital in Danville, KY. Kindred Hospital Central Ohio is a 33-bed long term acute care hospital in Mansfield, Ohio.

OBJECTIVE

This study is to determine if anti-reflux technology can decrease catheter occlusion and reduce the overall cost of catheter care.

METHODS

Both facilities collected data for six months with current practice, including number of occlusions, doses of tPA used, and needleless connector costs.

Nursing staff was trained in the use of the Nexus TKO®-6P anti-reflux needleless connector while being informed to continue current catheter care practices without change.

The same data collection process continued while anti-reflux technology was in use and results tabulated.

RESULTS

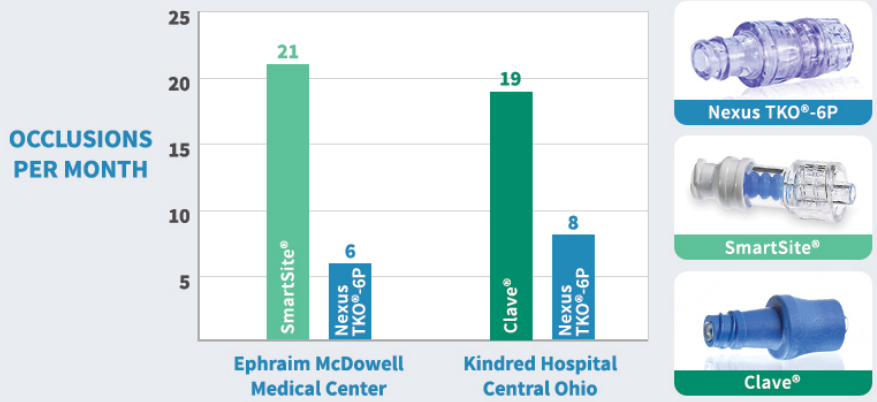
Ephraim McDowell Medical Center

The average number of doses of tPa in the six months prior to the trial equaled 21 does per month using the SmartSite® needleless connector. In the two months after Nexus TKO®-6P was implemented, 7 doses tPA in month one and 5 doses tPA in month two were given for an average of 6 per month, a 71% reduction in tPA usage.

Kindred Hospital Central Ohio

The average number of doses of tPA in the 6 months prior to the trial was 19 doses per month using the Clave® needleless connector. In the month during which Nexus TKO®-6P was used, 8 doses of tPA were given for a 58% reduction in tPA usage.

Many of the Kindred Hospital Central Ohio patients included in the month of Nexus TKO®-6P use were patients whose venous catheters had been in place for weeks/months prior to the addition of the anti-reflux device and may have had thrombotic material formation present. More study is needed to determine if placement of an anti-reflux device immediately following catheter placement will provide even greater occlusion reduction.



Anti-reflux Technology Reduces Catheter Complications and Provides Significant Cost Savings

2014 Infusion Nurses Society Poster Presentation

Julie Shomo BS, BSN, CRNI, VA-BC • Carla Reynolds BSN, CRNI, VA-BC • Aliva Gilbert BSN

Ephraim McDowell Medical Center - Danville, KY • Kindred Hospital Central Ohio - Mansfield, OH

Cost Savings - Ephraim McDowell Medical Center

	with SmartSite®	*with Nexus TKO®-6P*
Cost of tPA per month	$2,310	$660
Cost of needleless connectors per month	$680	$1,440
Catheter replacement cost based on 85% tPA success rate	$3,906	$1,116
Estimated Total Monthly Cost of Occlusion	$6,216	$1,776
Estimated Total Monthly Costs *(cost of needleless connectors and occlusion treatment)*	$6,896	$3,216

Ephraim McDowell expressed additional cost savings in reduction of costs associated with contrast dye studies necessary when unable to restore patency to implanted ports using tPA.

Monthly Savings with Nexus TKO®-6P anti-reflux needleless connector: **$3,680**

Annual Savings with Nexus TKO®-6P anti-reflux needleless connector: **$44,160**

Cost Savings - Kindred Hospital Central Ohio

	with Clave®	*with Nexus TKO®-6P*
Cost of tPA per month	$1,938	$816
Cost of needleless connectors per month	$396	$720
Catheter replacement cost based on 85% tPA success rate	$3,534	$1,488
Estimated Total Monthly Cost of Occlusion	$5,472	$2,304
Estimated Total Monthly Costs *(cost of needleless connectors and occlusion treatment)*	$5,868	$3,024

Because Kindred Hospital Central Ohio contracts with a company for lab services, additional cost savings were noted in reducing the fees associated with lab pick-ups that had to be rescheduled when the nurse was unable to draw blood due to a clotted catheter.

Monthly Savings with Nexus TKO®-6P anti-reflux needleless connector: **$2,844**

Annual Savings with Nexus TKO®-6P anti-reflux needleless connector: **$34,128**

CONCLUSIONS

SUMMARY: Anti-reflux technology is shown to be an effective tool to aid in efforts to provide increased positive patient outcomes while still reducing overall costs of patient care.

SUPPORT: Anti-reflux technology that provides protection from reflux at all times proves to significantly reduce catheter occlusions and the associated costs. Although tPA and catheter replacement were included in the cost analysis, other cost reductions were discovered by both facilities. Due to the strong relationship between occlusion and infection, both facilities are hopeful the reduction in catheter occlusions will assist in the fight against blood stream infection.

NEXT STEPS: Based on the significant complication reduction with central venous catheters, both hospitals are planning to conduct trials using anti-reflux technology on peripheral catheters to extend catheter life.

REFERENCES

Baskin JL, Pui C, Reiss U, et al. Management of occlusion and thrombosis associated with long-term indwelling central venous catheters. *Lancet* 2009 July 11; 374(9684): 159.

Jasinsky, LM, Wurster J. Occlusion reduction and heparin elimination trial using an antireflux device on peripheral and central venous catheters. *Journal of Infusion Nursing* 2009;32(1):33-39.

Journeycake JM, Buchanan GR. Thrombotic complications of central venous catheters in children. Curr Opin *Hematol* 2003;10:369–374.

Mohammad J. Enhanced risk of infection with device-associated thrombi. ASAIO 2000; Nov-Dec;46(6):S63-8.

Smartsite is a registered trademark of CareFusion Corporation. Clave is a registered trademark of ICU Medical, Inc. Nexus TKO is a registered trademark of Nexus Medical LLC