

Abstract Title: Reduction in Central Venous Catheter Occlusions: Examining the Clinical Impact of a Pressure Activated Anti-Reflux Connector

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Purpose & Rationale: The purpose of this study was to examine the clinical impact of using a Pressure Activated Anti-Reflux Needleless Connector (TKO-6P) in reducing occluded catheters caused by unintentional blood reflux. The goals: reduce pharmacy supply costs; reduce nursing time spent flushing central venous catheters (CVC's) and in troubleshooting occluded catheters; provide a failsafe automatic clamping solution for clinicians, one not dependent on a particular clamping sequence or practice to prevent unintentional blood reflux into our intravenous (IV) catheters.

Research Question: How will the use of the TKO-6P save on nursing time and on pharmacy supply cost spend when used on all CVC's?

Synthesis of Review of Literature: Needleless connector's were first introduced around 20 years ago as a way of protecting healthcare workers from needle stick injuries. Numerous device designs were introduced and are currently marketed as being one of three types: positive, neutral or negative, referring to the displacement of fluid from the tip of the IV catheter when the syringe is disconnected from the needleless connector. Knowing the type of connector a clinician is using is vital in terms of the clamping sequence: positive - clamp after removal of the syringe; neutral - no specific clamping sequence; negative – clamp prior to removal of the syringe. Most clinicians though are unaware of the type of needleless connector they are using. This results in improper clamping sequences, allowing blood to reflux in and out of IV catheters, causing occlusions requiring the use of Altepage (tPA) for catheter clearance.

Methods/Procedures: After defining the problem, measuring the use of heparin lock flushing and tPA usage retrospectively, a 3-month trial was conducted using the TKO-6P. Daily reports of tPA were reviewed and each dose was analyzed for appropriateness based off documentation, visualization of chest x-rays (CXR's) and other interventions utilized to troubleshoot the occluded catheter.

Results: After a 3 month trial, with the use of the TKO-6P, tPA usage decreased by 38%. Heparin lock flushing was eliminating, at 0.55 cents per syringe. Per these results, we concluded that by using the TKO-6P, we could safely eliminate use of heparin lock flushing of all CVC's with a subsequent reduction in tPA. Another discovery, based off chart reviews and tip location of the CVC's that were treated, out of the 71mg of tPA given, only 17mg were related to blood reflux.

Discussion/Application to Practice: The above resulted in many interventions. First, the TKO-6P was approved for use on all CVC's. Second, a CVC troubleshooting algorithm was produced by all members of IV Team. Third, the decision was made to restrict the ordering of tPA to members of the IV Team, who would order once a thorough CVC assessment was completed. This has resulted in a 66% reduction in the use of tPA to treat occluded CVC's, elimination of heparin lock flushing, saving the hospital over \$100K annually.