



Franklin Square  
Hospital Center

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MedStar Health

Staff Nurse Driven Project Supports Elimination of Heparin Flushes in Central Venous Catheters

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Nursing  
a strength of the Square

## Purpose

To determine the smallest amount of heparin needed to maintain patency of central venous catheters in a community hospital

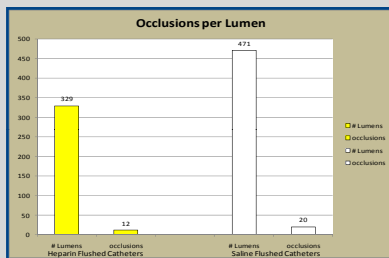
## PICO Statement

"What is the least amount of Heparin needed to maintain central venous catheter patency in adult patients in a busy community hospital setting" ?

## Significance

- \* Approximately 3-5% of patients exposed to Heparin will develop Heparin Thrombocytopenia (HIT)
- \* Formation of bio-film begins within 10 - 20 minutes after a catheter is placed. This build-up has been known to be a precursor to a septic event
- \* 87% of catheter related blood stream infections are related to some type of venous access device
- \* Catheter related blood stream infections cost hospitals \$25,000 – \$55,000 per event.
- \* Complications decrease patient satisfaction, complicate physician management of the patient and can significantly increase cost to the hospital in LOS

## Occlusions Per Lumen



## Literature Review

Complications related to use of heparin in CVCs are well documented as early as the late 1960's. Many studies have attempted to validate the need for heparin as a locking/flushing solution ultimately conceding the need for further study

A review was completed of over 30 articles categorized together as high level, low level and education on the subject.

Community hospital polls were done in 10 local hospitals with findings that 2 were flushing with 100Units Heparin, 4 were flushing with 10 or less Units of Heparin and 4 were using only saline flushes.

## Description

A dedicated vascular access team in our magnet community hospital conducted a two month study.

The first month was to determine a baseline analysis.

- \* Every central line lumen was flushed every 12 hours per policy
- \* When medications were administered via the central line, as per policy, the SASH (Saline-antibiotic-saline-heparin) Method was utilized.

Data collection included:

- \* Recording all occlusions
- \* Use of anti-thrombotic agents
- \* Re-prufusion rate

The second month a pilot was done utilizing only saline flushes

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Data collection included:

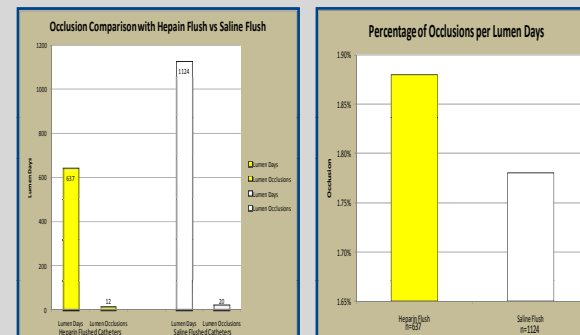
- \* Recording all occlusions
- \* Use of anti- thrombotic agents
- \* Re-prufusion rate

## Outcomes

The first month there were 192 CVCs with 329 lumens reflective of 637 lumen days. An occlusion rate of 12 lumens was recorded. Thus an occlusion rate of 3.65% per catheter. With an occlusion rate per lumen day of 1.88%.

The second month there were 231 CVCs with 471 lumens reflective of 1,124 lumen days with an occlusion rate of 20 lumens. This translates into an occlusion rate of 4.25% per catheter and 1.78% per lumen day.

## % Occlusion per Lumen Day



## Implications

After a 2 month study the Franklin Square hospital policy was revised to reflect a change in practice eliminating Heparin in CVC flushing.

A Task Force Committee is being formed to consider standardization of CVC flushing policies System Wide.

## Contact Information

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## References

Bradley C. and Munro P., 20<sup>th</sup> International Symposium on Intensive Care and Emergency Medicine – Brussels, Belgium. 21-24 March 2000. "The Effects of Using a Heparin-Free Flush System for Central Venous and Pulmonary Artery Catheters on a General Medical and Surgical Intensive Care Unit. Meeting abstract – not publish, not randomized. Two-4 week studies – (1)Heparin-Free flushes, (2)Heparin(dose is not sited). Conclusion- No statistical difference in the thrombus – associated complications between the two groups.

Buswell, Lori, RN,BSN, OCN, Beyea, Suzanne C. RN, PhD, CS Volume 5(3) March 24, 1998 *The Outline Journal of Knowledge Synthesis for Nursing*. "Flushing Protocols for Tunneled Central Venous Catheters: An Integrative Review of the Literature". Summary of 6 researches. Heparin dose, protocol, frequency varied between studies- very well documented. Conclusion: Flushing routines remain unclear and propose future studies.

Hataway, Lynn, C. RN, C, CRNI, MED. Volume 38 (6), June 2008, pp.34-40. *Nursing* (2008). "Targeting Therapy with Central Venous Access Devices". Educational article: preventing complications of CVC's. Noted that the use of Heparin flushes has become more controversial, in favor of saline only. Still needs more research.

Kannan, Anand, Volume 18(10) 2008 ISSN 1467-1026 *Clinical Feature* "Heparinized Saline or Normal Saline". Peer review, unsolicited, well referenced: Literature fails to demonstrate any advantage of Heparin over NS. Noted that HIT can occur following minimal heparin exposure, including heparin flush.

Muggli, Evi, Monash Institute of Health Service Research, Monash Medical Centre series 2002 Evidence Centre Critical Appraisal. Heparin Flushing of Peripherally Placed CVC. Integrated review - non research. PICO. Dosages were from 50Uq12/5000Uq6. Conclusion: Saline is just as effective as Heparin for maintaining patency of CVC.

Rice, L. (2004). Heparin –Induced Thrombocytopenia: Myths and Misconceptions (that will cause trouble for you and your patient). *Arch Intern Med*, 164, 1961-1964.

Rotello, Leo C., MD, FCCP, Albrant D., PharmD, Purcell T. RN, NP, Tet W. Chan, MD., Means M. MD, FCCP, Buckley, C. MD, Morton J. MD and Rogue T. MD, *American College of Chest Physicians*, October 24, 2007. "Incidence of Triple Lumen Catheter and Port Occlusion Utilizing Normal Saline Flushes". Collected data on 500 triple lumen CVC and 1500 port days, flushing with 10cc NS q 8 hrs. Line and Port occlusion= 4.8% and 2.9%. Very low incidence occurring before day 4 and peak occlusion rate on day 7. Conclusion: NS is as effective as Heparin,

Ryder, Marcia, PhD, MS, RN, *Journal of Parenteral and Enteral Nutrition*, Vol. 30, No. 1, pp. S82-S93 "Evidence-Based Practice in the Management of Vascular Access Devices for Home Parenteral Nutrition Therapy". Article dealing with CRBSIs, etiology and strategies for prevention, including bio-film, occlusions and devices