

Are Heparin Flushes the Most Effective Intervention for Reducing the Incidence of Peripherally Inserted Central Line Thrombosis in the Pediatric Intensive Care Unit?



Colleen McGauley, RN, BSN, Dawn McLaughlin, RN, BSN, Nicole Tavares, RN, BSN, Ashley Chandler, RN, BSN, Jen Samiotes, RN, MSN, Liz Croll, RN, BSN, Barbara Gallagher, RN, BSN, Arlene Kelleher, RN, MS, Kim Whalen, RN, MS, Virginia Capasso, PhD, ANP-BC, ACNS-BC, CWS

Massachusetts General Hospital, Boston, MA



Introduction

- In critically ill children, central venous catheter (CVC) thrombosis is associated with increased morbidity and mortality, prolonged hospital stays, and increased hospital costs.
- Identifying the interventions for pediatric patients that will reduce the incidence of central line thrombosis will improve patient outcomes.
- A literature review was conducted to investigate the effectiveness of treatments used to reduce the incidence of CVC thrombosis in pediatric patients.

Methods

- A comprehensive literature search was conducted and limited to peer reviewed English language studies from 1998-2017. CINAHL, OVID Nursing and OVID Medline were the databases searched. The Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) model was utilized.
- Type of CVC, method(s) to maintain CVC patency, endpoints of the studies, sample size, evidence level, quality and limitations were considered prior to synthesizing the evidence to evaluate fit, feasibility and appropriateness of potential recommendations.
- The following PICO question was the framework for of the EBP project: Are heparin flushes (I) more effective than other interventions (C) at reducing the incidence of thrombosis in central venous catheters (O) in critically ill pediatric patients (P)?

"No Flush, No Flow"



Results

- 30 studies were identified in the search for evidence.
- 16 / 30 references were eligible for inclusion: eight Level I studies (Experimental), three Level III studies (Non-experimental, Qualitative, Descriptive), and five Level V articles (Reviews of Literature).
- The overall quality of the evidence was good to high (consistent results, adequate sample size, some control, definitive conclusions, recommendations based on literature review), although there was great variation in the types of catheters (peripherally-inserted, tunneled, ports), approaches to maintaining catheter patency, and endpoints of the studies.
- Only one Level I study (Cesare, 2009), demonstrated significantly fewer CVC complications with heparin flushes than saline flushes through a positive pressure cap, although the study focused on tunneled CVC vs. peripherally-inserted CVC.

Discussion

- Overall, based on our review, there is limited evidence to inform prevention of thrombosis in peripherally-inserted CVC in pediatric critical care patients, thereby preventing translation of findings into practice.
- Original research is needed before recommending a nursing practice change.



References

Dearholt SL, Dang D (Eds). Johns Hopkins Nursing Evidence-Based Practice: Model and Guidelines (2nd Ed.) 2015; Indianapolis, IN: Sigma Theta Tau International