

CADTH Reference List

# Peripherally Inserted Central Catheter Line Flow Rates for Patients Requiring Continuous or Intermittent Administration of Medications

July 2021

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**Cite As:** *Peripherally Inserted Central Catheter Line Flow Rates for Patients Requiring Continuous or Intermittent Administration of Medications*. (CADTH reference list: summary of abstracts). Ottawa: CADTH; 2021 Jul.

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**Funding:** CADTH receives funding from Canada's federal, provincial, and territorial governments, with the exception of Quebec.

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## Key Messages

- No evidence was identified regarding the safety of different “keep vein open” or continuous flow rates for infusion of medication using peripherally inserted central catheter lines.
- No evidence-based guidelines were identified regarding the minimum flow rate for vascular lines.

## Research Questions

1. What is the safety of different “keep vein open” or continuous flow rates for infusion of medication using peripherally inserted central catheter lines?
2. What are the evidence-based guidelines regarding the minimum flow rate for vascular lines?

## Methods

### Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), the Cochrane Database of Systematic Reviews, the international HTA database, the websites of Canadian and major international health technology agencies, as well as a focused internet search. The search strategy comprised both controlled vocabulary, such as the National Library of Medicine’s MeSH (Medical Subject Headings), and keywords. The main search concepts were PICC lines, low flow rate, and “keep vein open.” An additional search for PICC lines was run, with CADTH-developed search filters applied to limit retrieval to guidelines. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2016 and July 5, 2021. Internet links were provided, where available.

### Selection Criteria and Summary Methods

One reviewer screened literature search results (titles and abstracts) and selected publications according to the inclusion criteria presented in Table 1. Full texts of study publications were not reviewed. The Overall Summary of Findings was based on information available in the abstracts of selected publications. Open access full-text versions of evidence-based guidelines were reviewed when abstracts were not available, and relevant recommendations were summarized.

## Results

No health technology assessments, systematic reviews, randomized controlled trials, or non-randomized studies were identified regarding the safety of different “keep vein open” or

**Table 1: Selection Criteria**

Criteria	Description
<b>Population</b>	Patients requiring continuous administration of medication, or patients requiring long-term intermittent administration of medication
<b>Intervention</b>	Q1: Peripherally inserted central catheter lines (e.g., CADD pump, Celsite PICC-CEL, PowerPICC, Per-Q-Cath, Groshong) at a set low “keep vein open” flow rate Q2: Peripherally inserted central catheters
<b>Comparator</b>	Q1: Peripherally inserted central catheter lines set at a different “keep vein open” flow rate Q2: Not applicable
<b>Outcomes</b>	Q1: Safety (e.g., central venous catheter occlusions, incorrect dosage of medication) Q2: Recommendations regarding the minimum flow rate to prevent occlusion (e.g., 2 mL/hour, 5 mL/hour, 20 mL/hour); recommendations regarding “keep vein open” or low continuous infusion flow rates
<b>Study designs</b>	Health technology assessments, systematic reviews, randomized controlled trials, non-randomized studies, evidence-based guidelines

continuous flow rates for infusion of medication using peripherally inserted central catheter lines. Furthermore, no evidence-based guidelines were identified regarding the minimum flow rate for vascular lines.

References of potential interest that did not meet the inclusion criteria are provided in Appendix 1.

## Overall Summary of Findings

No relevant literature was found regarding safety of different “keep vein open” or continuous flow rates for infusion of medication using peripherally inserted central catheter lines, and no evidence-based guidelines were found regarding the minimum flow rate for vascular lines; therefore, no summary can be provided.

## References

### Health Technology Assessments

No literature identified.

### Systematic Reviews and Meta-analyses

No literature identified.

### Randomized Controlled Trials

No literature identified.

### Non-Randomized Studies

No literature identified.

### Guidelines and Recommendations

No literature identified.

## Appendix 1: References of Potential Interest

### Non-Randomized Studies

#### *Descriptive Studies*

1. Paquet F, Marchionni C. What Is Your KVO? Historical Perspectives, Review of Evidence, and a Survey About an Often Overlooked Nursing Practice. *J Infus Nurs.* 2016;39(1):32-37. [PubMed](#)

#### *Alternative Intervention – Implanted Devices*

2. Gray KL, Steidley IG, Benson HL, et al. Implementation and 2-year outcomes of the first FDA-approved implantable apheresis vascular access device. *Transfusion.* 2019;59(11):3461-3467. [PubMed](#)