

CADTH Reference List

Blood Testing Before Peripherally Inserted Central Catheter Insertion

November 2022

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Cite As: *Blood Testing Before Peripherally Inserted Central Catheter Insertion*. (CADTH reference list: summary of abstracts). Ottawa: CADTH; 2022 Nov.

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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 Message

We found 2 evidence-based guidelines about the use of blood testing before peripherally inserted central catheter insertion.

Research Question

What are the evidence-based guidelines regarding blood testing before peripherally inserted central catheter insertion?

Methods

Literature Search Methods

A limited literature search was conducted by an information specialist on key resources including MEDLINE, 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 peripherally inserted central catheters. CADTH-developed search filters were applied to limit retrieval to guidelines. Where possible, retrieval was limited to humans. The search was completed on November 9, 2022, and limited to English-language documents published since January 1, 2015. 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 available, and relevant recommendations were summarized.

Results

Two evidence-based guidelines regarding blood testing before peripherally inserted central catheter (PICC) insertion were identified for this report.^{1,2}

Additional references of potential interest that did not meet the inclusion criteria are provided in [Appendix 1](#).

Table 1: Selection Criteria

Criteria	Description
Population	Patients requiring PICC
Intervention	Blood testing before PICC insertion (i.e., INR, PTT, platelets, creatinine)
Comparator	Not applicable
Outcomes	Recommendations regarding best practices (e.g., appropriate tests [e.g., INR, PTT, platelets, creatinine], alternative tests [e.g., estimated glomerular filtration rate], acceptable minimum and/or maximum lab value to proceed with insertion)
Study designs	Evidence-based guidelines

INR = international normalized ratio; PICC = peripherally inserted central catheter; PTT = partial thromboplastin time.

Overall Summary of Findings

Two evidence-based guidelines regarding blood testing before PICC insertion were identified.^{1,2} Both guidelines were from the US.^{1,2}

The *Society of Interventional Radiology Consensus Guidelines (2019)*¹ do not recommend blood coagulation screening (prothrombin time, international normalized ratio, platelet count, or hemoglobin) for low-risk procedures like PICC in patients who are low risk for bleeding. The guidelines suggest periprocedural laboratory value thresholds for patients who have an inherently higher bleeding risk (patients with hematologic disorders, patients receiving certain chemotherapies, or patients receiving anticoagulant therapy) and discuss periprocedural laboratory parameters for patients with chronic liver disease.¹ The *Michigan Appropriateness Guide for Intravenous Catheters Placement (2015)*² establish that an estimated glomerular filtration rate less than or equal to 44 mL/min is the threshold for inappropriate PICC use. A detailed summary of the recommendations and their corresponding strength and evidence quality is presented in [Table 2](#).

Table 2: Summary of Recommendations in Included Guidelines

Summary of recommendations	Quality of evidence and strength of recommendations
Society of Interventional Radiology (2019)¹	
<p>"Recommendation 2: For patients with minimal risk factors for bleeding, screening coagulation laboratory testing is not routinely recommended for procedures with low bleeding risk but may be considered for patients receiving warfarin or unfractionated heparin or for those with an inherently higher risk of bleeding. The following laboratory value thresholds have been suggested: correct INR to within range of 2.0 to 3.0 or less, consider platelet transfusion if platelet count is < 20 x 10⁹/L"</p>	<p>Level of evidence: D (based largely on scientific consensus established in the literature from limited-quality studies and the consensus of the Writing Group and Standards Committee volunteers)</p> <p>Strength of recommendation: Weak</p>

Summary of recommendations	Quality of evidence and strength of recommendations
<p>“Recommendation 4: For patients with chronic liver disease undergoing an invasive procedure, consider adjusting INR and platelet count thresholds higher and lower, respectively, than in the general population to minimize unnecessary transfusions. Measuring fibrinogen level may be useful, with replacement with cryoprecipitate if the level is low.”</p> <p>Suggested laboratory threshold for performance of a low-risk procedure in patients with chronic liver disease:</p> <ul style="list-style-type: none"> • INR: not applicable • Platelet count > 20 × 10⁹/L • Fibrinogen > 100 mg/dL 	<ul style="list-style-type: none"> • Level of evidence: E (expert consensus opinion) • Strength of recommendation: Weak
<p>• MAGIC (2015)²</p>	
<p>Inappropriate use for PICC use: “Placement in a patient with stage 3b or greater chronic kidney disease (estimated glomerular filtration rate ≤ 44 mL/min) or in patients currently receiving renal replacement therapy via any modality”</p>	<p>NR</p>

INR = international normalized ratio; MAGIC = Michigan Appropriateness Guide for Intravenous Catheters Placement; NR = not reported; PICC = peripherally inserted central catheter.

References

Guidelines and Recommendations

1. Patel IJ, Rahim S, Davidson JC, et al. Society of Interventional Radiology consensus guidelines for the periprocedural management of thrombotic and bleeding risk in patients undergoing percutaneous image-guided interventions-part II: recommendations: endorsed by the Canadian Association for Interventional Radiology and the Cardiovascular and Interventional Radiological Society of Europe. *J Vasc Interv Radiol*. 2019 Aug;30(8):1168-1184.e1161. [PubMed](#)
See Recommendation 2 on page 1173; Table 3: Low Bleeding Risk on page 1174; Recommendation 4 on page 1176; Table 4: Procedure Risk – Low on page 1176
2. Chopra V, Flanders SA, Saint S, et al. The Michigan Appropriateness Guide for Intravenous Catheters (MAGIC): results from a multispecialty panel using the RAND/UCLA appropriateness method. *Ann Intern Med*. 2015 Sep 15;163(6 Suppl):S1-40. [PubMed: PM26369828](#) [PubMed](#)
See Table 2: Guide to PICC Use – Inappropriate indications for PICC use on page S11.

Appendix 1: References of Potential Interest

Non-Randomized Studies

3. Amirahmadi R, Sullivan S, Britton N, Siegel A, Spiegel R, Miceli J, Duong V, Sholander JT, Fontaine MJ, McCurdy MT. Lowering platelet count threshold to 10,000/ μ L for peripherally inserted central catheter placement safely conserves blood products. *Ann Hematol*. 2022 Sep;101(9):2045-2052. [PubMed](#)

Guidelines and Recommendations

Unclear Methodology

4. Edmonton Zone consensus guidelines for management of abnormal coagulation in bedside, imaging-guided procedures. Edmonton (AB): Alberta Health Services; 2016: <https://www.albertahealthservices.ca/assets/wf/lab/wf-lab-ez-consensus-guidelines-for-management-of-abnormal-coagulation-inr.pdf>. Accessed 2022 Nov 14. See section Procedure-Specific: Low risk procedures on page 2; Table 1: Low risk of bleeding on page 3.

Review Articles

5. Moureau N, Chopra V. Indications for peripheral, midline and central catheters: summary of the MAGIC recommendations. *Br J Nurs*. 2016 Apr 28-May 11;25(8):S15-24. [PubMed](#)