

Prevention of phlebitis in patients with peripheral intravenous catheters: a scoping review protocol

Prevención de la flebitis en pacientes con catéteres intravenosos periféricos: protocolo de revisión del alcance

Prevenção de flebite em pacientes com cateteres intravenosos periféricos: protocolo de revisão de escopo

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Abstract

This study aimed to map the literature for recommendations on safe practices for preventing phlebitis in hospitalized patients using peripheral intravenous catheters (PIC). The review protocol was developed according to the Joanna Briggs Institute (JBI) guidelines, based on the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-SCR) checklist. The protocol is registered in the Open Science Framework (OSF) with DOI number: 10.17605/OSF.IO/AC6QE. The databases included MEDLINE/PubMed, LILACS, Scopus, CINAHL, Web of Science, BDTD, and Google Scholar. Study management will be performed using EndNote and exported to Rayyan software, where they will be analyzed by two independent reviewers who will screen titles and abstracts, followed by a full review of potentially relevant articles. Any discrepancies in the study selection process will be resolved by a third reviewer. The results will be tabulated using a PRISMA-SCR flowchart and presented in tables to meet the objective of this review. The results will be disseminated through professional social media, presentations at conferences, and publication in a scientific journal.

Descriptors: Clinical Practice Guideline; Phlebitis; Peripheral Catheterization; Inpatients; Catheter.

Resumen

Este estudio tuvo como objetivo recopilar la literatura sobre recomendaciones para prácticas seguras de prevención de la flebitis en pacientes hospitalizados con catéteres intravenosos periféricos (CIP). El protocolo de revisión se desarrolló según las directrices del Instituto Joanna Briggs (JBI), basándose en la lista de verificación PRISMA-SCR (Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews). El protocolo está registrado en el Open Science Framework (OSF) con el número DOI: 10.17605/OSF.IO/AC6QE. Las bases de datos consultadas fueron MEDLINE/PubMed, LILACS, Scopus, CINAHL, Web of Science, BDTD y Google Scholar. La gestión del estudio se realizó con EndNote y los datos se exportaron al software Rayyan, donde dos revisores independientes analizaron los títulos y resúmenes, seguidos de una revisión completa de los artículos potencialmente relevantes. Cualquier discrepancia en el proceso de selección de estudios será resuelta por un tercer revisor. Los resultados se tabularán utilizando un diagrama de flujo PRISMA-SCR y se presentarán en tablas para cumplir con el objetivo de esta revisión. Los resultados se difundirán a través de redes sociales profesionales, presentaciones en congresos y su publicación en una revista científica.

Descriptores: Guía de Práctica Clínica; Flebitis; Cateterismo Periférico; Pacientes Hospitalizados; Catéter.

Resumo

Objetivou-se mapear na literatura recomendações de práticas seguras para prevenção de flebite em pacientes hospitalizados, em uso de cateteres intravenosos periféricos (CIVP). Protocolo de revisão elaborado de acordo com as diretrizes do Joanna Briggs Institute (JBI), baseado no checklist do Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-SCR). Protocolo registrado na Open Science Framework (OSF) com o número DOI: 10.17605/OSF.IO/AC6QE. As bases de dados incluem MEDLINE/PubMed, LILACS, Scopus, CINAHL, Web of Science, BDTD e Google Scholar. O gerenciamento dos estudos será realizado no aplicativo EndNote e exportado para o software Rayyan, onde serão analisados por dois revisores independentes que realizarão a triagem de títulos e resumos, seguidos por uma revisão completa de artigos potencialmente relevantes. Eventuais divergências no processo de seleção dos estudos serão resolvidas por um terceiro revisor. Os resultados serão tabulados através de um diagrama de fluxo PRISMA-SCR e apresentados em tabelas a fim de atender ao objetivo dessa revisão. Os resultados serão divulgados por meio de mídias sociais profissionais, apresentações em congressos e publicação em um periódico científico.

Descritores: Guia de Prática Clínica; Flebite; Cateterismo Periférico; Pacientes Internados; Cateter.

Therefore, this scoping review aims to map the literature for recommendations on safe practices for preventing phlebitis in hospitalized patients using peripheral venous catheters.

Methodology

This article presents the protocol for a scoping review of the available evidence in the literature, developed according to the guidelines of the Joanna Briggs Institute (JBI)⁷. The report of this review is structured according to the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-SCR)⁸. This review protocol was registered on the Open Science Framework (OSF) platform with the DOI number: 10.17605/OSF.IO/AC6QE.

Before drafting this protocol, an exploratory search was conducted to identify previously published systematic or scoping reviews on the prevention of phlebitis in patients with peripheral venous catheters to verify the originality and necessity of this review. The following sources of synthesized evidence were consulted: Cochrane Library (systematic reviews), JBI Evidence Synthesis (systematic reviews and evidence syntheses), PROSPERO (prospective registry of reviews), and the Open Science Framework (OSF) to identify registered review protocols.

Eight publications were identified⁹⁻¹⁶, including systematic reviews, scoping studies, meta-analyses, and a best practice implementation project, whose central objective was to investigate, prevent, and manage complications associated with the use of peripheral venous catheters. However, gaps are still observed in the mapping of safe practices for the prevention of phlebitis in these patients. These gaps are mainly concentrated in risk factors, fixation and dressing procedures, and different strategies for implementing protocols that investigate the difficulties experienced, especially by the nursing staff, in adhering to best practices, thus justifying the realization of this study.

Guiding Question

For the formulation of the research question, the mnemonic PCC⁷ was used, where Problem/Population: Patients with peripheral intravenous catheters; Concept: Safe practices for the prevention of phlebitis in patients with peripheral intravenous catheters; and Context: Hospitalization (Chart 1).

Thus, the following question was formulated: "What safe practices are recommended for the prevention of phlebitis in hospitalized patients with peripheral intravenous catheters?"

Chart 1. Elements of the PCC. Rio de Janeiro, RJ, Brazil, 2026

Element	Definition
P (Population)	Adult patients (≥ 18 years) hospitalized and using a peripheral venous catheter.
C (Concept)	Safe practices/phlebitis prevention: care during insertion, maintenance, dressings, and care protocols.
C (Context)	Hospital institutions (public or private), any specialty (clinical/surgical), without geographical restriction.

Introduction

Cannulation, or puncture of vascular access using peripheral intravenous catheters (PICCs), is a common practice and is considered one of the most frequently performed invasive procedures during patient hospitalization. This technique allows for rapid access to the vascular system and is less invasive and less complex than other techniques¹⁻³. This type of procedure is performed by the nursing team, where the type of catheter to be inserted is chosen to enable the infusion of substances necessary for the patient's therapy and/or diagnosis. This is based on the estimated duration and type of therapy to be infused. Uses of central venous catheters (CVP) include fluid therapy, medication administration, parenteral nutrition, blood products, and others^{2,3}.

Approximately 90% of hospitalized patients receive solutions and medications intravenously. Of these, 50% to 75% of patients are using peripheral intravenous therapy (PIV), a therapeutic and diagnostic procedure that enables the administration of medications, fluids, and other blood and nutritional components into the body; however, it can develop local or systemic complications. Several studies demonstrate the association of PIV use with local complications such as hematomas/ecchymosis, infiltration, local infection, venous spasm, phlebitis, and thrombophlebitis, with a consequent increase in morbidity and mortality, prolonged hospitalization, and increased healthcare costs^{1,3,4}.

Among the most frequent complications, phlebitis stands out, defined as an inflammation of the intima layer of the vein, due to mechanical, chemical, or bacterial sources, characterized by the following signs and symptoms: local pain, erythema, edema, local hardening, and/or palpable tendinous cord^{1,3}.

Between January and December 2023, 61,478 incidents involving intravenous catheters were reported to the National Health Surveillance System (SNVS) through the Notivisa system, representing 16.6% of the total incident notifications made by the Patient Safety Centers (NSPs) of health services during that period, constituting the second most reported incident in the Health Surveillance Notification System (Notivisa)⁵. Given the relevance of epidemiological data, it is understood that risk identification, determination of contributing factors, and the development of patient safety practices are fundamental to reducing these adverse events. It is essential to adopt measures to prevent incidents associated with peripheral vascular disease (PVDs) in healthcare services, namely: hand hygiene, catheter and insertion site selection, skin antisepsis, catheter stabilization, flushing and maintenance of the

Eligibility Criteria

This review will include primary studies available in full, published or not, with a quantitative, qualitative, or mixed approach, in Portuguese, English, and Spanish, within the time frame of the last 10 years (2015-2025), due to the publication of guidelines relevant to the topic in the period^{6,17-19}, ensuring the timeliness of the evidence.

Studies will be selected according to the elements defined by the PCC mnemonic. All studies involving adult patients (≥18 years) using peripheral venous catheters and articles presenting best practices for phlebitis prevention, regardless of the triggering factor, will be included. Finally, the context will consider studies conducted in public or private hospital institutions, regardless of specialty:

clinical/surgical. Secondary studies such as reviews, editorials, expert opinion articles, editor's letters, and duplicates will be excluded. Studies involving patients using other intravenous devices, such as Peripherally Inserted Central Catheters (PICCs), Central Venous Catheters, and arterial lines, will also not be included.

Search Strategies and Information Sources

The search strategy will be formulated from a combination of controlled descriptors defined from the Health Sciences Descriptors (DeCS) and MeSH (Medical Subject Headings) and/or keywords related to the topic, with restrictions related to language or publication periods, as shown in Chart 2.

Chart 2. Search strategies. Rio de Janeiro, RJ, Brazil, 2026

Question structure	Term	DeCS	Alternative terms	MeSH	Entry terms	Outlines
P Problem	Phlebitis	Flebite	Periphlebitis	Phlebitis	Phlebitides Periphlebitis Periphlebitides	"phlebitis"[MeSH Terms] OR "Phlebitis"[Title/Abstract]
	Peripheral venous catheter	Cateterismo Periférico	Peripheral Venous Catheterization	Catheterization, Peripheral	Peripheral Venous Catheterization Peripheral Venous Catheterizations	"catheterization, peripheral"[MeSH Terms]OR "Peripheral Venous Catheterization"[Title/Abstract] OR "Peripheral Venous Catheterizations"[Title/Abstract]
C Concept	Best practices	Guia de Prática Clínica	Good Practice Guide Medical Practice Guide	Practice Guideline	Guideline [Publication Type] Guidelines as topic	"guideline"[Publication Type] OR "guidelines as topic"[MeSH Terms] OR "guideline"[Title/Abstract]
C Context	Inpatients/ hospitalized patients	Pacientes internados	Inpatients	Inpatients	Inpatients	"inpatients"[MeSH Terms] OR inpatients[Title/Abstract]

To identify the studies, the following databases will be selected: CAPES portal (Coordination for the Improvement of Higher Education Personnel), LILACS, MEDLINE/PubMed, Web of Science, Scopus, and CINAHL. In addition to these databases, searches will be conducted in various thesis and dissertation repositories and on Google Scholar. All identified keywords and indexing terms will be incorporated into the strategy, adapted for each database and/or information source included in this review. A table containing this information (information source/database, keywords/indexing terms, search strategy, and number of studies found) will be prepared and presented as the final

appendix to this review. The database search will be conducted in three stages. The first step consists of an initial search in the Medline (PubMed) database to analyze words contained in the titles and abstracts of the retrieved articles, as well as the indexing terms, as shown in Chart 3. In addition, a more comprehensive search will be conducted, containing the indexed terms and keywords in all databases included in the study, found anywhere in the articles (Chart 4). The third and final step will involve a manual search of the reference lists of the studies included in the review. The search strategies for each database will be structured with the help of a librarian.

Chart 3. PubMed database search. Rio de Janeiro, RJ, Brazil, 2026

Search	Strategy	Retrieved studies
#1	"catheterization, peripheral"[MeSH Terms]OR "Peripheral Venous Catheterization"[Title/Abstract] OR "Peripheral Venous Catheterizations"[Title/Abstract]	968
#2	"guideline"[Publication Type] OR "guidelines as topic"[MeSH Terms] OR "guideline"[Title/Abstract]	13,867
#3	#1 AND #2	18

Chart 4. Search strategies with indexed terms. Rio de Janeiro, RJ, Brazil, 2026

Database/ information source	Search strategies	Studies identified
PubMed	("catheterization, peripheral"[MeSH Terms]OR "Peripheral Venous Catheterization"[Title/Abstract] OR "Peripheral Venous Catheterizations"[Title/Abstract]) AND ("guideline"[Publication Type] OR "guidelines as topic"[MeSH Terms] OR "guideline"[Title/Abstract]) AND ((y_10[Filter]) AND (ffrft[Filter]) AND (alladult[Filter])) NOT (central) AND ((y_10[Filter]) AND (ffrft[Filter]) AND (alladult[Filter]))	18
Embase	('peripheral venous catheterization' OR (peripheral AND venous AND ('catheterization'/exp OR catheterization))) AND ('guideline'/exp OR 'guideline') AND (2015:py OR 2016:py OR 2017:py OR 2018:py OR 2019:py OR 2020:py OR 2021:py OR 2022:py OR 2023:py OR 2024:py OR 2025:py) AND ([adult]/lim OR [aged]/lim OR [very elderly]/lim)	61
Epistemonikos	(title:(peripheral venous catheterization AND guideline) OR abstract:(peripheral venous catheterization AND guideline))	11
Web of Science	Peripheral venous catheterization AND guideline (all fields); 2015-2025; english or spanish; all open access	29
Scopus	"peripheral venous catheterization" AND guideline AND PUBYEAR > 2015 AND PUBYEAR < 2026 AND NOT Central AND (LIMIT-TO (OA , "all")) AND (LIMIT-TO (SUBJAREA , "HEAL") OR LIMIT-TO (SUBJAREA , "NURS") OR LIMIT-TO (SUBJAREA , "MEDI")) AND (LIMIT-TO (LANGUAGE , "English") OR LIMIT-TO (LANGUAGE , "Spanish") OR LIMIT-TO (LANGUAGE , "Portuguese")) AND (LIMIT-TO (EXACTKEYWORD , "Adult"))	08
LILACS	(catéter venoso periférico) AND (boas práticas) AND fulltext:("1") AND la:("pt" OR "en" OR "es") AND (year_cluster:[2015 TO 2025]) AND fulltext:("1") AND (year_cluster:[2015 TO 2025]) AND instance:"lilacsplus"	14
Capes	(peripheral venous catheter) AND (best practices) 2020-2025, open access: any field	06
Google Scholar	"Best practices" and "peripheral venous catheter" - central	33
BDTD	All "Peripheral Venous Catheter" fields and all "Best Practices" fields from 2015-2025	04

Ethics and Disclosure

This study does not include human participants or unpublished secondary data. Therefore, approval from a research ethics committee involving human subjects is not required. The results will be disseminated through professional social media, presentations at conferences, and publication in a scientific journal.

Study Selection Process

The identified studies will be imported into EndNote for duplicate removal and subsequently imported into Rayyan software. Studies without duplicates will then be evaluated and selected based on eligibility criteria by two independent, blinded reviewers through reading the title and abstract of the studies (phase 1), followed by reading the full text of the studies selected in phase 1 (phase 2). In

addition, the reference lists cited by the studies selected in phase 2 will be analyzed to identify other eligible studies for inclusion in this review. Any discrepancies in the study selection process will be resolved by a third reviewer.

Data Extraction Process from Selected Studies

The data from the selected studies will be analyzed and collected by two independent reviewers, using a characterization table in Excel adapted for this study, based on the form recommended by the JBI to facilitate the synthesis of evidence. The characterization of the studies will be developed along two axes: Study identification (Title, author, year of publication, country of origin) and Abstract (Objective, methodology, sample, intervention, results, conclusions), as shown in Chart 5.

Chart 5. Characterization of studies. Rio de Janeiro, RJ, Brazil, 2026

No.	Title	Author	Year of publication	Country of origin	Methodology	Objective	Sample	Intervention	Results	Conclusions
#1										
#2										
#3										
#4										
#5										
#6										
...										



The methodological analysis of the studies will not be validated, as this step is not necessary in scoping reviews, whose objective is to provide a map of the evidence produced rather than seeking the best available evidence to answer a specific question. At the end of this process, all the information retrieved from the studies will be cross-referenced. Discrepancies will be resolved by a third reviewer.

Data Synthesis

A qualitative (narrative) summary of the data from the selected studies will be provided, describing the safe

practices for preventing phlebitis in hospitalized patients with peripheral venous catheters proposed in each study. A descriptive table will gather all this information.

Expected Results

This review is expected to provide recommendations for safe practices in the prevention of phlebitis in hospitalized patients using peripheral intravenous catheters, organizing them into the preparation, execution, and maintenance stages, in order to support the development of innovative solutions to reduce the incidence of this condition.

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