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A systematic review and critical appraisal of clinical practice recommendations for the prevention, detection and treatment of postpartum hemorrhage

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - Preliminary searches.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 December 2025 and was last updated on 19 December 2025.

INTRODUCTION

Review question / Objective This systematic review will answer three questions: 1. How have international, national and regional organizations and societies defined postpartum hemorrhage (PPH) and severe PPH? 2. How do the clinical practice recommendations from various Canadian and international guidelines on the prevention and treatment of PPH compare with each other and with the newly published (2025) World Health Organization guidelines? 3. What is the methodological quality of published clinical practice guidelines on the prevention, detection and treatment of PPH?

Rationale Postpartum hemorrhage (PPH) or excessive blood loss at childbirth remains the leading cause of maternal mortality and serious morbidity worldwide, affecting between 1% and 10% of all births. (1, 2) According to the World Health Organization (WHO), approximately 260,000 women died from pregnancy and childbirth-related causes in 2023, with PPH contributing substantially to this burden. (3) Despite advances in obstetric care, the incidence of PPH has shown an upward trend in high-income countries. In Canada, for example, PPH rates increased from 5.1% to 6.2% between 2003 and 2010. (4, 5) These figures highlight the persistent and growing challenge of PPH even in well-resourced health systems.

A survey by the Canadian Obstetrics Survey System (CanOSS) which received responses from 167 of the 289 birthing facilities across Canada reported that in 82.5% of these facilities, PPH was the leading cause of severe maternal morbidity. (6) Provincial data from the Ontario similarly identifies PPH as the leading cause of maternal mortality over the past 20 years. (7)

In response to this global challenge, several international organizations and professional societies have published clinical practice guidelines (CPGs) for the prevention, detection, and treatment of PPH. However, these guidelines vary considerably in their definitions or thresholds for diagnosing PPH and recommended

interventions for preventing and treating PPH. This heterogeneity not only poses challenges to evidence synthesis but the inconsistencies across guidelines contribute to low adoption of recommendations and hinder the implementation of interventions, resulting in direct adverse clinical impacts from failure to appropriately prevent PPH as well as delayed diagnosis and treatment of PPH. To address these challenges, WHO, along with the International Federation of Gynaecology and Obstetricians (FIGO) and the International Confederation of Midwives (ICM) published a consolidated guideline in October 2025 aimed at providing pregnancy care providers around the world with a unified and evidence-based approach to preventing, detecting and treating PPH.

These WHO-FIGO-ICM guidelines were developed using rigorous processes and their adoption globally could reduce mortality and severe morbidity from PPH. However, CPGs from professional bodies around the world differ considerably, not only in their clinical practice recommendations, but also in how they define PPH and severe PPH. It remains unclear whether national and regional guidelines incorporate the most up-to-date research, and whether they follow a transparent and rigorous development process. Concerns about variability in development methods and transparency raise questions about the quality and trustworthiness of existing guidelines.

The rationale for this project is to systematically identify and critically appraise publicly accessible guidelines and protocols for the prevention, detection, and treatment of PPH. This appraisal will describe differences in definitions and clinical practice recommendations and assess methodological quality of CPGs using validated appraisal tools. This is the first step towards creating awareness about these differences, so that international, national and regional organizations can begin to align their CPGs in keeping with the best available evidence, while still contextualizing it to diverse health care settings.

Condition being studied Postpartum Hemorrhage and Severe Postpartum Hemorrhage.

METHODS

Search strategy The search strategy will be developed by members of research team, with the help of a medical information specialist, in keeping with the Peer Review of Electronic Search Strategies (PRESS) guidelines.(8) The search will include controlled vocabulary terms and keywords related to clinical practice guidelines, policy statements, protocols, clinical pathway, postpartum hemorrhage and obstetric hemorrhage. The search will be restricted from January 01st 2000 onwards to include CPGs that are most relevant to contemporary clinical practice. In addition, we will conduct grey literature searches using Google and Google Scholar search engines to identify national and regional guidelines published on professional association websites but not in indexed journals.

Screening: Two reviewers will screen titles and abstracts after duplicates have been removed based on the inclusion and exclusion criteria. Full texts for potentially eligible articles will be similarly reviewed in duplicate to identify articles that should be included. Discrepancies will be resolved through mutual discussion or adjudication by a senior reviewer.

Participant or population All birthing individuals.

Intervention All interventions aimed at the prevention, detection, and treatment of PPH.

Comparator All comparators and comparisons are of interest; no specific comparator will be prioritized or excluded.

Study designs to be included We will include clinical practice guidelines and protocols that provide recommendations for the prevention, diagnosis, and management of PPH.

Eligibility criteria Inclusion Criteria: We will include clinical practice guidelines (CPGs) and protocols that meet the following attributes:

- Publication Year: 2000 to present
- Language: No restrictions
- Publishing region: world-wide
- Scope: International, national and regional.
- Clinical Focus: PPH
- Purpose: Prevention, detection and / or treatment of PPH
- Format: CPGs and protocols presented as text, algorithms, decision paths, or tables which provide definitions of PPH and recommendations for its prevention, detection and treatment.
- Specific Methodological Standards: To answer Question 1, we will include all documents that provide a definition of PPH and/or severe PPH. To answer Questions 2, we will only include CPGs and protocols that have made recommendations aimed at prevention and treatment of PPH. To answer Question 3, we will only include CPGs that have described an evidence-based and/or consensus development process along with the levels of confidence and clinical recommendations. If there are updates to guidelines within the search

dates employed, only the latest version of the guideline will be included.
• Intended End-Users: Health care professionals, policy makers, hospital administrators and professional societies and organizations.
• Type of CPG: Complete Guidelines and Protocols
Exclusion Criteria: We will exclude protocols developed by individual hospitals or birthing facilities, as well as protocol drafts, conference papers, opinions, discussion papers, reviews and summaries of clinical practice guidelines where the full guideline was available elsewhere.

Information sources We will run our search in the following three bibliographic databases: Ovid MEDLINE, Turning Research into Practice (TRIP Database) and Guidelines International Network (GIN). We will also supplement the search through hand searching DynaMed database, The TRIP Database is a specialized clinical search engine that provides organized access to high-quality, evidence-based information and included guidelines and evidence summaries for clinical practice or research. It has content from hundreds of organizations worldwide, and ensures comprehensive coverage of international evidence., It is also regularly updated to reflect the latest research and recommendations. Similarly, the open access GIN library contains links to over 3000 guidelines, published or endorsed by GIN members, health guidelines from non-member organisations and a register of planned guidelines and guidelines in development. Finally, DynaMed is a clinical decision support tool and is updated daily to incorporate expert methodologic analysis of the most current research, literature, and guidelines.

Main outcome(s)
1. Comparison of definitions of PPH and severe PPH
2. Comparison of clinical practice recommendations for the prevention and treatment of PPH
3. Assessment of methodological quality of CPGs.

Additional outcome(s) None.

Data management We will use the Covidence platform for data management, which includes title, abstract and full text screening. We will use Microsoft Excel and Word for data extraction and comparative analysis.
Data Extraction
General characteristics of the included CPGs such as title, year of publication, publishing organization (name and location), scope of topics addressed, and PICAR (Population, Intervention, Comparison, Attributes, Recommendations, characteristics or other considerations) elements (9) will be extracted using a standardized data extraction form. This form will be iteratively refined during the extraction phase to accommodate emerging data needs. For studies 1 and 2, one reviewer will extract definitions of PPH and severe PPH and clinical practice recommendations for prevention and treatment of PPH across all included CPGs, and protocols, and a second reviewer will cross check 20% of the data entries for quality assurance. For study 3, two independent reviewers will assess methodological quality as described in the section below. Discrepancies will be resolved through discussion and consensus with a senior reviewer.

Quality assessment / Risk of bias analysis The quality of included CPGs will be assessed using the modified NEATS (National Guideline Clearinghouse Extent of Adherence to Trustworthy Standards) Instrument (2024), which evaluates guideline trustworthiness against Institute of Medicine (IOM) standards. (10) This instrument includes 10 items across 8 domains, focusing on methodological rigor rather than reporting alone. Two items are scored Yes/No (Yes = 5, No = 1), while the remaining eight use a 5-point Likert scale (1 = lowest adherence, 5 = highest). Four domains are considered critical: conflict of interest management, study selection, synthesis of evidence, and grading of recommendation strength. Each CPG will receive item-level and total scores, allowing for comparison across guidelines. This structured appraisal will help identify strengths, weaknesses, and variability in guideline development and evidence assessment.

Strategy of data synthesis The analytic component will include the following parts
1. Comparison of definitions: For each guideline, we will present a descriptive analysis comparing definitions of PPH and, where available, severe PPH, including diagnostic method and cutoff threshold using clinical and laboratory markers,
2. Comparison of recommendations for prevention and treatment: We will present a descriptive comparison of various recommendations grouped under sub-headings such as Risk Factor Assessment, Strategies for Prevention, First-line (conservative) treatment, Other (second- and third line) medications, Fluid administration and transfusion of blood and blood products, minimally invasive surgical approaches, Surgical treatment, and parameters for escalation / transfer. The strength and certainty of evidence supporting each recommendation will be reported.
3. Assessment of methodological quality: As described in the quality assessment section, each

guideline will be assessed using the Modified NEATS instrument, which includes ten components scored on a 5 point Likert scale. For each guideline, we will calculate an overall score by averaging the ratings across all items. This mean score will represent the guideline's overall adherence to the Institute of Medicine standards for trustworthiness. In accordance with the Modified NEATS framework, the four critical domains described in the quality assessment section will serve as the primary measure of trustworthiness, and mean scores across them will be calculated separately. To aid interpretation, scores will also be expressed as percentages of the maximum possible score (mean score ÷ 5 × 100).

Subgroup analysis NA.

Sensitivity analysis NA.

Language restriction We will not limit the search by Language of the publication of guidelines.

Country(ies) involved The review will be carried out in Canada, in the Department of Obstetrics and Gynaecology at McMaster University.

Keywords Obstetric hemorrhage; Postpartum hemorrhage; Definition; Diagnostic criteria; Prevention; Treatment Clinical practice guidelines; Clinical Consensus Statements; Protocols; Maternal health; Systematic review.

Dissemination plans The results of this systematic review will be published as three separate papers in open-access journals with a global readership – the first will be a comparison of definitions of PPH and Severe PPH, the second a comparison of recommendations and methodological quality of Canadian CPGs and protocols as compared with the WHO-FIGO-ICM CPG and the third will be a comparison of methodological quality and recommendations of international CPGs as compared with the same reference standard. The findings will also be presented at national and international conferences of Obstetrics & Gynecology and midwifery. Summaries and editorials will be published in the WHO Bulletin and journals with a global health focus. Copies of these publications will be sent to all organizations whose documents were included in the publications.

Contributions of each author

Author 1 - Jiadong Li - Designing the review; screening and data collection; data extraction, analysis, and interpretation for the first part of the review question; and drafting the manuscript.
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References

1. Ubom AE, Muslim Z, Beyeza-Kashesya J, Schlembach D, Malel ZJ, Begum F, et al. Postpartum hemorrhage: Findings of a global survey by the World Association of Trainees in Obstetrics and Gynecology (WATOG). Int J Gynaecol Obstet. 2025;171(2):593-600.
2. Blaha J, Bartosova T. Epidemiology and definition of PPH worldwide. Best Pract Res Clin Anaesthesiol. 2022;36(3-4):325-39.
3. Division WHOUUWBGUP. . Geneva: WHO; 2025. Contract No.: 9789240108462.
4. Mehrabadi A, Liu S, Bartholomew S, Hutcheon JA, Kramer MS, Liston RM, et al. Temporal trends in postpartum hemorrhage and severe postpartum hemorrhage in Canada from 2003 to 2010. J Obstet Gynaecol Can. 2014;36(1):21-33.
5. Escobar MF, Nassar AH, Theron G, Barnea ER, Nicholson W, Ramasauskaite D, et al. FIGO recommendations on the management of postpartum hemorrhage 2022. Int J Gynaecol Obstet. 2022;157 Suppl 1(Suppl 1):3-50.
6. Malhame I, Seymour RJ, Ashraf R, Gehrke P, Beyene J, Seedu T, et al. Feasibility of establishing a Canadian Obstetric Survey System (CanOSS) for severe maternal morbidity: results of a nationwide survey. Public Health Pract (Oxf). 2025;10:100650.
7. Sprague AE, Roberts NF, Lavin Venegas C, Nath T, Shah PS, Barrett J, et al. Mortality Following Childbirth in Ontario: A 20-Year Analysis of Temporal Trends and Causes. J Obstet Gynaecol Can. 2024;46(12):102689.

8. McGowan J. . J Clin Epidemiol. 2016;75:6.
9. Johnston A, Kelly SE, Hsieh SC, Skidmore B, Wells GA. Systematic reviews of clinical practice guidelines: a methodological guide. J Clin Epidemiol. 2019;108:64-76.
10. Ghadimi M, Guyatt G, Brignardello-Petersen R. Modifications to the NEATS instrument for more appropriate and reproducible assessment of guidelines trustworthiness. Clinical and Public Health Guidelines. 2024;1(3).