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Severe Cardiovascular Complications during and after Pregnancy: Protocol for a Scoping Review

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ADMINISTRATIVE INFORMATION

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Conflicts of interest - Rohan D'Souza reports grants from the Public Health Agency of Canada, Juravinski Research Institute, and Hamilton Academic Health Sciences Organization, International Vasa Previa Foundation, and the Perinatal Society of Australia and New Zealand and personal fees from Ferring, Sanofi and Pfizer outside the submitted work. He also holds a Tier-2 Canada Research Chair Award (#CRC-2021-00337). Other authors have no conflicts of interest to declare.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 7 February 2026 and was last updated on 7 February 2026.

INTRODUCTION

Review question / Objective Numerous terminologies, definitions and indicators have been used to describe severe cardiovascular complications during and after pregnancy (SCCP) making it difficult to estimate its true global incidence or compare outcomes between countries. The objective of this scoping review is to identify all published terminologies, definitions and indicators describing SCCP.

Background Pregnancy induces substantial physiological changes in the cardiovascular system [1] thereby increasing the risk of cardiovascular complications among individuals with pre-existing heart disease and those with risk factors such as anemia, hypertension, diabetes, obesity, and thrombophilia who are unable to adequately accommodate these adaptations. Cardiovascular conditions have also been major

contributors to the rise in severe maternal morbidity (SMM) in recent years,[2] which refers to serious complications during pregnancy, labour, childbirth, and postpartum resulting in severe illness, prolonged hospitalization or long-term disability[3] and remain a leading cause of pregnancy related deaths, near miss events and severe maternal morbidity globally [4,5]. One of the key objectives in cardio-obstetrics research is to study SCCP. However, research aimed at reducing SCCP is challenged by the lack of a standardized definition and set of indicators to describe these events.

Rationale The lack of uniformity in outcome definitions for SCCP limits the ability to accurately estimate incidences, compare findings across studies, and inform clinical practice and policy development. This scoping review seeks to address this gap by identifying and comparing the definitions of SCCP currently in use, as a first step

in operationalizing a harmonized definition through international consensus.

METHODS

Strategy of data synthesis A medical information specialist (MH) developed a comprehensive search strategy for literature review. The search strategy included controlled vocabulary (medical subject headings/Emtree) terms and keywords / free text terms related to cardiovascular System, pregnancy complications, cardiovascular disease. These terms were paired with pregnancy-related keywords including pregnancy, maternal, prenatal, postpartum, obstetric, childbirth, and peripartum. Boolean operators and proximity searching (e.g., adj3, adj4) were used to capture variations in phrasing and ensure relevant studies were included. No limitations were applied regarding language and publication year.

Eligibility criteria Inclusion Criteria:

- All original research studies included but are not limited to randomized controlled trials, cohort studies, case-control studies, and cross-sectional studies.
- Studies published in English-language
 - o Studies published from January 2000 to September 2024
 - o Studies that define severe cardiovascular complications of pregnancy

Exclusion Criteria:

Studies that list various cardiovascular morbidities that are not considered severe or life-threatening.

Source of evidence screening and selection

The following databases were searched by a medical information specialist (MH) according to the Peer Review of Electronic Search Strategies (PRESS) Guidelines[6]: Ovid MEDLINE, Ovid Embase, Ovid EBM Reviews – Cochrane Database of Systematic Reviews, Ovid EBM Reviews – Cochrane Central Register of Controlled Trials, PubMed, and Clarivate Web of Science. The first 100 results from Google Scholar were extracted using the Publish or Perish application[7]. Grey literature including clinicalTrials.gov and manual searching of reference lists were also performed. Four reviewers (NS,SS,SA and TT) independently reviewed the titles and abstract to check inclusion and exclusion criteria. Any disagreements were resolved by discussion or consulting a senior author. The same four reviewers independently screened full texts. Discrepancies were resolved by a third reviewer (RD), if any disagreements remained after discussion among the reviewers.

Data management All references and duplicate records were managed and screened using Covidence software [8]. Data extraction was performed using a predefined form developed on Microsoft Excel to capture study characteristics including study year, title, study period, sample size, author, country, terminologies, definitions, indicators and international classification of disease (ICD) codes to describe SCCP.

Reporting results / Analysis of the evidence

Preferred Reporting Items for Systematic Reviews and Meta-Analyses – Extension for Scoping Reviews (PRISMA-ScR) guidelines [9] will be used for reporting the study results. Given the nature of the review, we will only perform a narrative synthesis listing all published terminologies, definitions, indicators and international classification of disease (ICD) codes. If data permits, we will categorize these based on region, study design, and population characteristics. No subgroup analysis or sensitivity analysis is planned.

Presentation of the results Tables will be used to provide a descriptive summary of the key characteristics of the included studies, such as the country, scope, sample size, selection process of the indicators, definitions used. A PRISMA flowchart will be used to present the selection process.

Language restriction No language restriction was imposed in the search strategy.

Country(ies) involved Canada.

Keywords Severe cardiovascular morbidity; pregnancy; postpartum; major adverse cardiac events; maternal cardiac health; severe pregnancy complications; severe maternal morbidity.

Dissemination plans The findings of this review will be shared through an open-access peer-reviewed publication, presentations at national and international obstetrics, maternal-fetal medicine and cardiology conferences.

Contributions of each author

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