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Perioperative Management in Neurosurgery: Protocol for A Scoping Review of Multicenter Randomized Controlled Trials

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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 17 June 2025 and was last updated on 27 June 2025.

INTRODUCTION

Review question / Objective To map and characterize multicentered randomized controlled trials that evaluate perioperative management strategies in adult patients undergoing brain neurosurgery. The findings will help clarify the current state of high-level evidence in this field and inform future research directions.

Background Neurosurgery of the brain involves a range of complex procedures with significant implications for patients' neurological and functional outcomes. Optimal perioperative management is essential to mitigate risks such as cerebral ischemia, raised intracranial pressure, and postoperative cognitive dysfunction. Directing research efforts towards high-impact clinical questions is essential to ensure clinical practice aligns with the best available evidence. Despite advances in anesthetic and neuromonitoring strategies, high-level evidence and guidance in this field remains fragmented.

Rationale A clear overview of key evidence in the perioperative management of patients undergoing brain surgery is essential to inform research directions, knowledge translation, and clinical practice and highlight gaps in the literature. By consolidating existing high-level evidence, this scoping review will help distinguish well-studied areas from those lacking robust data and provide a foundation for future systematic reviews, clinical trials, and research efforts.

METHODS

Strategy of data synthesis Search strategies will be created with the help of a librarian. A comprehensive literature search will be performed

through the MEDLINE, PubMed, Cochrane, Web of Science, and Embase databases. Reference lists of included studies will also be manually searched. The complete search strategies will be included with the published manuscript.

Eligibility criteria The review will include multicenter randomized controlled trials involving adult patients (≥18 years) undergoing intracranial neurosurgical procedures. Eligible studies must examine perioperative management strategies, including but not limited to anesthetic techniques, hemodynamic management, neuromonitoring, neuroprotective measures, or sedation protocols. Outcomes of interest include neurological endpoints (e.g., stroke, intracranial pressure control, functional recovery), neurocognitive outcomes (e.g., postoperative delirium or cognitive dysfunction), perioperative morbidity or mortality, and overall quality of recovery. Studies must be published in English. No restrictions will be placed on date of publication.

Source of evidence screening and selection Titles and abstracts will be screened independently by two reviewers. Full-text review will follow to confirm eligibility. Discrepancies will be resolved by consensus or a third reviewer.

Data management A standardized data extraction form will be created and refined. Data will be charted independently by two reviewers and will include study characteristics, population, type of neurosurgery, intervention, comparator, outcomes measured, and key findings.

Language restriction English.

Country(ies) involved Canada.

Keywords Perioperative management; Neurosurgery; Multicenter randomized controlled trials; Neuroanesthesia; Neuromonitoring; Anesthetic techniques; Intracranial pressure; Postoperative cognitive dysfunction.

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