

# INPLASY

## Perioperative anesthetic management for adult elective craniotomy: a scoping review protocol

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### ADMINISTRATIVE INFORMATION

**Support** - No support.

**Review Stage at time of this submission** - Preliminary searches.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202660142

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 30 June 2026 and was last updated on 30 June 2026.

### INTRODUCTION

**Review question / Objective** The objective of this scoping review is to identify and map existing standards, guideline recommendations, consensus statements, institutional protocols, and commonly recommended perioperative anesthetic care processes relevant to adult patients undergoing elective intracranial craniotomy under general anesthesia.

The review will address the following question: What practice guidance and perioperative anesthesia care processes have been described for adult elective craniotomy, and how can these recommendations be organized across preoperative, intraoperative, and postoperative domains?

**Background** Elective craniotomy is a complex neurosurgical procedure requiring careful perioperative anesthetic management to maintain cerebral perfusion, optimize surgical conditions, support neurologic protection, and reduce

postoperative complications. Anesthetic care for craniotomy may involve preoperative risk assessment, intraoperative monitoring, hemodynamic and ventilatory management, brain relaxation strategies, analgesia, emergence planning, postoperative disposition, and structured handover. Although these elements are widely recognized as important, the specific practices recommended across the literature vary considerably.

Existing guidance for adult elective craniotomy anesthesia is distributed across clinical practice guidelines, society statements, consensus documents, narrative reviews, systematic reviews, institutional pathways, and individual clinical studies. These sources differ in scope, level of evidence, terminology, and practical specificity. Some emphasize ideal or resource-intensive practices, while others provide broader recommendations that may not clearly define which perioperative care processes are consistently recommended across settings. As a result, clinicians, educators, researchers, and quality-improvement teams lack a consolidated

map of the available guidance relevant to adult elective craniotomy anesthesia.

A scoping review is therefore appropriate to systematically identify, catalogue, and organize existing recommendations and perioperative care processes for adult patients undergoing elective intracranial craniotomy under general anesthesia. By mapping the available literature across preoperative, intraoperative, and postoperative domains, this review will clarify areas of consistency, highlight variation in current guidance, and identify gaps requiring further research or standardization.

**Rationale** Elective craniotomy is a physiologically complex procedure requiring close coordination between anesthetic management, surgical conditions, and neurologic protection. Although multiple guidelines, reviews, institutional pathways, and expert recommendations address aspects of craniotomy anesthesia, the available guidance is heterogeneous in scope, specificity, and applicability. A scoping review is therefore needed to systematically identify, catalogue, and organize existing recommendations and care processes relevant to adult elective craniotomy anesthesia. This evidence map will clarify what guidance exists, identify recurring perioperative care domains, and highlight gaps in the available literature.

## METHODS

**Strategy of data synthesis** Findings will be synthesized narratively and presented in tables and evidence maps. Recommendations and care processes will be grouped by perioperative domain and source type. Redundant or overlapping recommendations will be consolidated where appropriate, while preserving important distinctions in wording, scope, and context. No meta-analysis will be performed.

**Eligibility criteria** Sources will be eligible if they address perioperative anesthetic management for adult patients undergoing elective intracranial craniotomy under general anesthesia. Eligible sources may address preoperative, intraoperative, or postoperative anesthesia-related care processes, including assessment, optimization, monitoring, induction, maintenance, hemodynamic management, ventilation, brain relaxation, neuroprotection, emergence, analgesia, postoperative disposition, and handover.

**Source of evidence screening and selection** All records identified through electronic database

searches will be imported into reference management software (Covidence) and duplicates will be removed. Titles and abstracts will then be screened independently by two reviewers against the predefined eligibility criteria. Sources considered potentially relevant by either reviewer will undergo full-text review. Full texts will be assessed independently by two reviewers, with disagreements resolved through discussion or consultation with a third reviewer.

Eligible sources will include documents addressing perioperative anesthetic management or practice guidance for adult patients undergoing elective intracranial craniotomy under general anesthesia. Sources focused exclusively on awake craniotomy, emergent neurosurgery, pediatric populations, procedures not requiring craniotomy, or topics without actionable relevance to anesthetic care will be excluded. Grey literature sources, including society guidance and publicly available institutional protocols or pathways, will be screened using the same eligibility criteria. Reasons for exclusion at the full-text stage will be recorded, and the selection process will be summarized using a PRISMA flow diagram.

**Data management** Titles and abstracts will be screened independently by two reviewers, followed by full-text review of potentially relevant sources. Disagreements will be resolved through discussion or consultation with a third reviewer. Data will be extracted using a standardized extraction form. Extracted information will include citation details, year of publication, country or region, source type, target population, craniotomy indication or procedure type where applicable, perioperative domain, specific recommendations or care processes, and any stated rationale or implementation considerations.

**Reporting results / Analysis of the evidence** Findings will be synthesized descriptively and presented using tables, figures, and narrative summary. Included sources will be summarized according to publication characteristics, source type, country or region, target population, clinical context, and perioperative domain. Extracted recommendations and care processes will be mapped across preoperative, intraoperative, and postoperative phases of care.

Recommendations will be grouped thematically into relevant anesthesia care domains, including preoperative assessment and optimization, intraoperative monitoring, anesthetic technique, hemodynamic management, ventilation, brain relaxation, neuroprotection, analgesia, emergence,

postoperative disposition, and handover. Where recommendations overlap, similar items will be consolidated while preserving meaningful differences in scope, wording, or clinical context. Areas of consistency, variability, and evidence gaps will be described narratively.

No quantitative meta-analysis will be performed, as the purpose of this scoping review is to map existing guidance and care processes rather than estimate intervention effects. Formal risk-of-bias assessment will not be conducted because sources will be included to identify relevant recommendations rather than to determine comparative effectiveness. The results will be reported in accordance with PRISMA-ScR guidance, and the study selection process will be presented using a PRISMA flow diagram.

**Presentation of the results** Results will be presented using a PRISMA flow diagram, summary tables, and a narrative synthesis. A table of included sources will summarize publication characteristics, source type, country or region, target population, clinical context, and perioperative domain. Extracted recommendations and care processes will be organized into a recommendation map, with rows representing discrete anesthesia care processes and columns summarizing the source, perioperative phase, clinical domain, and nature of the recommendation.

A draft charting table will include the following fields: author/year, source type, country or region, target population, craniotomy indication where applicable, perioperative phase, anesthesia care domain, specific recommendation or care process, supporting rationale where reported, and implementation considerations. Recommendations will be grouped across preoperative, intraoperative, and postoperative domains, including assessment and optimization, monitoring, anesthetic technique, hemodynamic management, ventilation, brain relaxation, neuroprotection, analgesia, emergence, postoperative disposition, and handover.

The results will be reported narratively to describe areas of consistency, variation, and gaps in available guidance.

**Language restriction** Yes, the search will be limited to English-language sources.

**Country(ies) involved** Canada and United States of America.

**Other relevant information** Not applicable.

**Keywords** Craniotomy; Neuroanesthesia; General anesthesia; Perioperative care; Neurosurgery; Practice guidance; Care pathway.

**Dissemination plans** The findings will be submitted for publication in a peer-reviewed journal and may be presented at relevant anesthesia, neuroanesthesia, or neurosurgical conferences. The review will provide an organized map of existing recommendations and care processes to inform future research, quality improvement, and protocol development in adult elective craniotomy anesthesia.

#### Contributions of each author

Author 1 - Vitaliy Voznyy - Contributed to the conception and design of the review, drafted the protocol, developed the eligibility criteria and data charting approach, will participate in screening and data extraction, synthesize the findings, and draft the final manuscript.

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Author 5 - Tumul Chowdhury - Contributed to the conception and design of the project, provided methodological and clinical oversight, will supervise study conduct and interpretation of findings, and will critically revise and approve the final manuscript.

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