# Systematic review

see Systematic literature review.

- Bed rest duration and development of cerebrospinal fluid leaks after intradural spinal surgery: a meta-analysis of comparative studies
- Clinical epidemiology, management and outcomes of traumatic cervical spinal-cord and spine injuries: a systematic review of 1645 pooled cases
- Efficacy of repeat discectomy alone versus with spinal fusion in recurrent lumbar disc herniation: a systematic review and meta-analysis of randomized studies
- Edaravone dexborneol for the treatment of acute ischemic stroke: A systematic review and meta-analysis
- Stereotactic laser ablation for pediatric central nervous system tumors: a systematic review and meta-analysis of the literature
- Massive pneumocephalus as a risk factor for recurrence after chronic subdural hematoma surgery: A systematic review and meta-analysis
- Artificial Intelligence based radiomic model in Craniopharyngiomas: A Systematic Review and Meta-Analysis on Diagnosis, Segmentation, and Classification
- Constructing a Digital Bridge: A Systematic Review Assessing EMR and Telehealth Implementation for Neurosurgery in Uganda

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Systematic reviews are categorized into various types based on their objectives, methods, and areas of focus. Below are the main types of systematic reviews:

1. Quantitative Systematic Review Focus: Synthesizes quantitative data from studies (e.g., clinical trials) to answer a specific research question. Example: Evaluating the effectiveness of a drug or intervention. Common Method: Meta-analysis (when data are combinable). Outcome: Numerical estimates of effects or outcomes. 2. Qualitative Systematic Review Focus: Synthesizes qualitative data to explore themes, perspectives, and experiences related to a specific phenomenon. Example: Understanding patient experiences with a chronic disease. Common Method: Thematic or narrative synthesis. Outcome: Descriptive insights and frameworks. 3. Mixed-Methods Systematic Review Focus: Combines both quantitative and qualitative data to provide a comprehensive understanding of a research question. Example: Assessing the effectiveness of an intervention alongside patients' experiences with it. Outcome: Integration of numerical results with contextual understanding. 4. Umbrella Review (Overview of Reviews) Focus: Synthesizes findings from multiple systematic reviews on related topics. Example: Reviewing evidence on different treatments for the same condition. Outcome: Broad summary of evidence across reviews. 5. Scoping Review Focus: Maps the extent, range, and nature of research in a field to identify gaps or clarify concepts. Example: Exploring all research on digital health interventions for chronic diseases. Outcome: Overview of the literature without critical appraisal. 6. Rapid Review Focus: Conducts a systematic review within a condensed timeframe by simplifying certain methods (e.g., limiting the number of databases searched). Example: Quick evidence synthesis for urgent policy decisions during a pandemic. Outcome: Timely but potentially less comprehensive evidence. 7. Cochrane Review Focus: A gold-standard systematic review focusing on health interventions and conducted according to strict Cochrane Collaboration protocols. Example: Comparing outcomes of different surgical techniques. Outcome: High-quality, rigorously appraised evidence. 8. Realist Review Focus: Explores how and why complex interventions work (or don’t) in particular contexts. Example: Investigating why community health programs succeed in some regions but not others. Outcome: Context-sensitive explanations and theories. 9.

Network Meta-Analysis Focus: Compares multiple interventions directly and indirectly within a systematic review framework. Example: Ranking the effectiveness of different drugs for the same condition. Outcome: Comparative effectiveness and rankings. 10. Living Systematic Review Focus: Regularly updated review to include newly published evidence on a rapidly evolving topic. Example: Monitoring COVID-19 vaccine efficacy. Outcome: Continuously updated synthesis of evidence. 11. Systematic Review of Methodologies Focus: Examines and synthesizes research methods used in a field. Example: Evaluating methods for assessing quality of life in cancer patients. Outcome: Recommendations for methodological best practices. 12. Integrative Review Focus: Integrates quantitative, qualitative, and theoretical literature to provide a comprehensive understanding of a topic. Example: Exploring the social determinants of mental health. Outcome: Conceptual models or frameworks.

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Neurosurgeons are inundated with the Herculean task to keep abreast with the rapid pace at which clinical research is proliferating. Systematic reviews and meta-analyses (SRMAs) have consequently surged in popularity because when executed properly, they constitute the highest level of evidence, and may save busy neurosurgeons many hours of combing the literature. Well-executed SRMAs may prove instructive for clinical practice, but poorly conducted reviews sow confusion and may potentially cause harm. Unfortunately, many SRMAs within neurosurgery are relatively lackluster in methodological rigor. When neurosurgeons apply the results of an SRMA to patient care, they should start by evaluating the extent to which the employed methods have likely protected against misleading results [1)]

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Despite clearly established guidelines, recent audits have found the conduct and reporting of systematic reviews and metaanalysis (SRMAs) within neurosurgery to be relatively lackluster in methodological rigor and compliance. Protocols of SRMAs allow for planning and documentation of review methods, guard against arbitrary decision-making during the review process, and enable readers to assess for the presence of selective reporting. To aid transparency, authors should provide sufficient detail in their protocol so that the readers could reproduce the study themselves. Development of our guideline drew heavily from the Preferred Reporting Items for Systematic Reviews and Meta-analyses Protocols (PRISMA-P) initiative. The objective of this article is not to enumerate every detail of this checklist, but to provide guidance to authors preparing their protocol, with examples, for a systematic review in neurosurgery. Particularly, we emphasize on the PICO framework - population (P), interventions (I), comparators (C), outcomes (O) - which is central to constructing a clinical question, defining the scope of the systematic review, defining and prioritizing the primary outcome, to specifying the eligibility criteria, designing the search strategy, and identifying potential sources of heterogeneity. We encourage our readers to make use of this guideline alongside the PRISMA-P 2015 statement, when drafting and appraising systematic review protocols [2)].

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Lee KS, Higgins JP, Prevedello DM. Systematic reviews and meta-analyses in neurosurgery part I: interpreting and critically appraising as a guide for clinical practice. Neurosurg Rev. 2024 Jul 18;47(1):339. doi: 10.1007/s10143-024-02560-4. PMID: 39023639.
2)
Lee KS, Prevedello DM. Systematic reviews and meta-analyses in neurosurgery Part II: a guide to designing the protocol. Neurosurg Rev. 2024 Jul 26;47(1):360. doi: 10.1007/s10143-024-02555-1. PMID: 39060698.