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Umbrella Review Protocol: Evidence Grading of Acupoint Stimulation for Postoperative Recovery under General Anesthesia

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ADMINISTRATIVE INFORMATION

Support - No support.

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 24 July 2026 and was last updated on 24 July 2026.

INTRODUCTION

Review question / Objective Research question (PICOS): Among surgical patients receiving general anesthesia (P), does any type of acupoint stimulation as a perioperative adjunct (I), compared with sham or standard/blank care (C), improve postoperative recovery outcomes (O), based on evidence from published systematic reviews and meta-analyses (S)? Objectives: (1) Systematically summarize published SR/MAs on acupoint stimulation for postoperative recovery under general anesthesia; (2) appraise their methodological quality with AMSTAR-2; (3) grade certainty of evidence per outcome using GRADE, cross-validated by the Ioannidis 4-tier classification; (4) evaluate overlap of primary studies across SR/MAs using CCA; (5) compare evidence by stimulation type (electroacupuncture/TEAS vs manual acupuncture vs acupressure vs auricular) and by control type (sham vs standard care); (6) identify weak-evidence areas and future research directions.

Rationale Acupoint stimulation (electroacupuncture, TEAS, manual acupuncture, acupressure, auricular acupuncture, moxibustion, laser acupuncture) is widely studied as a perioperative adjunct to improve postoperative recovery after general anesthesia, including PONV, pain, recovery quality, and length of stay. Numerous SR/MAs have been published, but they differ substantially in inclusion criteria, methodological quality, and conclusions. Intervention heterogeneity is high across stimulation types, making clinical interpretation difficult. No unified re-appraisal and grading of this evidence exists, leaving clinical guidelines without a clear strength-of-evidence basis. An umbrella review is needed to systematically re-evaluate existing evidence, grade certainty per outcome, and distinguish trustworthy from weak evidence.

Condition being studied The health problem is impaired postoperative recovery following general anesthesia, encompassing postoperative nausea and vomiting (PONV), postoperative pain, poor recovery quality, prolonged hospital stay,

postoperative delirium/cognitive dysfunction, and delayed bowel function. Acupoint stimulation is used as an adjunct intended to mitigate these. This review focuses on the strength and consistency of systematic-review-level evidence for these recovery outcomes in the general-anesthesia surgical population.

METHODS

Search strategy Databases: PubMed, Embase, Cochrane Library, Web of Science Core Collection, CNKI, Wanfang, CBM (inception to search date).
English (PubMed) strategy:
#1: (acupunct* OR electroacupunct* OR "transcutaneous electrical acupoint stimulation" OR TEAS OR acupressure OR "auricular acupunct*" OR "auricular acupressure" OR "perioperative acupuncture" OR moxibustion OR "laser acupuncture")
#2: ("general anesthesia" OR "general anaesthesia" OR surgery OR surgical OR perioperative)
#3: ("postoperative recovery" OR PONV OR "postoperative nausea" OR "postoperative vomiting" OR "postoperative pain" OR "recovery quality" OR QoR OR "length of stay" OR "postoperative delirium" OR POCD OR "postoperative cognitive dysfunction")
#4: ("systematic review" OR "meta-analysis" OR "overview of systematic reviews" OR "umbrella review")
Final: #1 AND #2 AND #3 AND #4
Chinese (CNKI/Wanfang) strategy:
（针刺 OR 电针 OR 经皮穴位电刺激 OR TEAS OR 穴位按压 OR 耳针 OR 穴位刺激 OR 艾灸）AND（全身麻醉 OR 全麻 OR 手术 OR 围手术期）AND（术后恢复 OR 术后康复 OR 术后恶心呕吐 OR PONV OR 术后疼痛 OR 恢复质量 OR 住院时间）AND（系统评价 OR Meta分析 OR 荟萃分析 OR 系统综述.

Participant or population Surgical patients receiving general anesthesia, regardless of surgical type, age, or sex (adults and children both eligible).

Intervention Any type of acupoint stimulation as a perioperative adjunct: electroacupuncture, transcutaneous electrical acupoint stimulation (TEAS), manual acupuncture, acupressure, auricular acupuncture, as well as moxibustion and laser acupuncture. Because moxibustion and laser acupuncture differ mechanistically, they are analyzed in separate strata and not pooled with needle-based methods.

Comparator Two comparator strata analyzed separately and never pooled: (1) sham/placebo acupuncture (estimates specific efficacy); (2) standard care or blank control (estimates incremental efficacy).

Study designs to be included Published systematic reviews and/or meta-analyses (with explicit inclusion/exclusion criteria and search strategy) of randomized controlled trials on the topic. Narrative reviews, editorials, and abstracts without meta-analysis are excluded.

Eligibility criteria Inclusion: SR/MA must report at least one defined postoperative recovery outcome with a quantitative pooled effect size (RR/OR/MD/SMD) and 95% CI; languages Chinese or English. Exclusion: non-systematic reviews; SRs without quantitative pooling; duplicate publications (retain newest/most complete); unobtainable full text after multiple attempts; non-surgical anesthesia populations (e.g., painless abortion, endoscopy); studies using acupuncture as the primary anesthetic (acupuncture anesthesia) rather than an adjunct.

Information sources Seven databases (PubMed, Embase, Cochrane Library, Web of Science, CNKI, Wanfang, CBM) from inception to the search date. Supplementary: hand-searching reference lists of included SR/MAs (snowballing); searching protocol registries (PROSPERO, INPLASY) for unpublished or ongoing SR/MAs; manual search of core journals and recent conference proceedings; contacting original authors for missing data.

Main outcome(s) (1) PONV incidence: total incidence within 24 h postoperatively (RR/OR). (2) Postoperative pain intensity: 24-h VAS/NRS pain score or opioid consumption (MD/SMD). Effect metrics and time points reported per SR/MA.

Additional outcome(s) (1) Recovery quality: QoR-40/QoR-15 scores; (2) Length of stay: postoperative days; (3) Postoperative delirium/cognitive dysfunction (POD/POCD) incidence; (4) Bowel function recovery: first flatus/defecation time; (5) Adverse events related to acupoint stimulation.

Data management Identified records managed in EndNote/Zotero with automatic deduplication. A standardized Excel extraction form captures SR/MA characteristics, AMSTAR-2 items, effect sizes, CIs, I2, sample sizes, and the primary-study lists needed for CCA. Two reviewers extract independently; discrepancies resolved by discussion or a third reviewer. Missing data

requested from authors; if unavailable, noted and addressed in analysis. Extracted data and analysis scripts will be shared on completion.

Quality assessment / Risk of bias analysis Methodological quality of each included SR/MA appraised with AMSTAR-2 (16 items; rated high/moderate/low/critically low). Risk of bias in the evidence body informed by mapping AMSTAR-2 overall rating to GRADE risk-of-bias input (high -> no downgrade; moderate -> -1; low/critically low -> -1 to -2). Overlap of primary studies across SR/MAs assessed with CCA; publication bias via funnel plot, Egger's/Begg's tests (>=10 SR/MAs per outcome), p-curve, and excess-significance test.

Strategy of data synthesis Synthesis conducted at the SR/MA level; individual patient data are NOT re-pooled. Methods: (1) descriptive synthesis tabulating SR/MA characteristics, quality, effect sizes and 95% CIs; (2) forest plots per outcome; (3) GRADE grading per 'intervention x outcome' evidence body, with sham and standard-care strata separate; (4) Ioannidis 4-tier classification as cross-validation. A 'combination filter' applies: only 'intervention x outcome x comparator' combinations with >=2 SR/MAs receive formal GRADE grading and pooling; combinations with a single SR/MA are described only and flagged as weak evidence.

Subgroup analysis Pre-specified subgroups: (a) by stimulation type – electroacupuncture/TEAS, manual acupuncture, acupressure, auricular, moxibustion and laser acupuncture analyzed separately; (b) by comparator – sham vs standard care; (c) by surgical type – abdominal, orthopedic, gynecologic, other; (d) by methodological quality – high vs moderate/low/critically-low SR/MAs. AMSTAR-2 quality rating is mapped to GRADE risk-of-bias.

Sensitivity analysis (1) Leave-one-out: sequentially remove one SR/MA to test conclusion stability; (2) high-quality only: restrict to high/moderate-quality SR/MAs (AMSTAR-2); (3) overlap-adjusted: exclude the SR/MA with the highest CCA overlap; (4) language: sensitivity to Chinese-only vs English-only inclusion if feasible. Multiple-comparison correction (Bonferroni/FDR) applied across outcomes as a robustness check, independent of Ioannidis grading.

Language restriction No language restriction; Chinese and English publications are included.

Country(ies) involved China.

Other relevant information This is an Umbrella Review (Overview of Systematic Reviews) – a systematic review of published systematic reviews/meta-analyses, not a primary-study review; therefore no re-pooling of individual patient data is performed. Primary registration target is PROSPERO; INPLASY is used as an alternative/bilateral registration if PROSPERO processing is delayed. Evidence grading uses GRADE as primary with Ioannidis 4-tier cross-validation. Overlap is quantified by CCA with four-tier thresholds (=15%). Single-SR/MA combinations are described only. All manuscripts must be in English except the search-strategy field.

Keywords acupuncture; acupoint stimulation; electroacupuncture; TEAS; manual acupuncture; acupressure; auricular acupuncture; moxibustion; laser acupuncture; general anesthesia; perioperative; postoperative recovery; postoperative nausea.

Dissemination plans Findings will be submitted to a SCI journal in anesthesiology or complementary medicine; presented at academic conferences; translated into a clinical decision-support summary; and the data-extraction form and analysis results will be made publicly available upon completion.

Contributions of each author

Author 1 - Daichen Song - Conceived the umbrella review, drafted the protocol, designed the evidence-grading framework (GRADE + Ioannidis), and will supervise study selection, quality appraisal, data synthesis and manuscript approval.
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Author 2 - Xiaoling Yan - Developed and executed the search strategy across databases, performed title/abstract and full-text screening, managed records, and will extract data and assess citation overlap (CCA).
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Author 3 - Chong Li - Contribution: Performed AMSTAR-2 quality appraisal of included systematic reviews, conducted statistical synthesis and bias assessment (Egger/Begg, excess significance), and drafted the methods and results sections.
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