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General Anesthesia versus Regional Anesthesia on Perioperative Outcomes in Patients with Heart Disease: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

Support - None.

Review Stage at time of this submission - The review has not yet started.

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 4 May 2026 and was last updated on 4 May 2026.

INTRODUCTION

Review question / Objective This review aimed to investigate whether general anesthesia differs from regional anesthesia in perioperative adverse cardiac events and mortality among adult surgical patients with preoperative heart disease. Secondary outcomes were assessed including postoperative complications, and length of hospital stay.

Condition being studied Patients with underlying heart disease belong to high-risk surgical populations and are susceptible to hemodynamic fluctuation, myocardial ischemia, arrhythmia and other perioperative cardiovascular complications. Appropriate anesthetic strategy is critical for perioperative cardiac protection. General anesthesia and regional anesthesia (including neuraxial blockade and peripheral nerve block) are two mainstream clinical anesthesia methods. At present, existing clinical studies have inconsistent conclusions regarding the prognostic differences between general anesthesia and regional anesthesia in cardiac comorbid patients. No comprehensive meta-analysis has focused specifically on cardiac patients to unify controversial clinical results. Therefore, this systematic review and meta-analysis was conducted to quantitatively summarize current clinical evidence.Patients with underlying heart disease belong to high-risk surgical populations and are susceptible to hemodynamic fluctuation, myocardial ischemia, arrhythmia and other perioperative cardiovascular complications. Appropriate anesthetic strategy is critical for perioperative cardiac protection. General anesthesia and regional anesthesia are two mainstream clinical anesthesia methods. At present, existing clinical studies have inconsistent conclusions regarding the prognostic differences between general anesthesia and regional anesthesia in cardiac comorbid patients. Regional anesthesia includes neuraxial blockade and peripheral nerve block in this study. No comprehensive meta-analysis has focused specifically on cardiac patients to unify controversial clinical results. Therefore, this

systematic review and meta-analysis was conducted to quantitatively summarize current clinical evidence.

METHODS

Participant or population Adult patients aged ≥18 years with diagnosed heart disease undergoing non-cardiac surgery.

Intervention General anesthesia.

Comparator Regional anesthesia, including neuraxial blockade (spinal, epidural, combined spinal-epidural) and peripheral nerve block.

Study designs to be included Randomized controlled trials and clinical observational studies.

Eligibility criteria Study design: Published randomized controlled trials and clinical observational studies.
Participants: Adult patients aged ≥18 years with diagnosed heart disease undergoing non-cardiac surgery.
Intervention: General anesthesia.
Comparator: Regional anesthesia, including neuraxial blockade (spinal, epidural, combined spinal-epidural) and peripheral nerve block.
Outcomes: Report at least one primary or secondary outcome
Language: English and Chinese.

Information sources PubMed, Embase, Cochrane Library, Web of Science, CNKI, Wanfang, VIP (from inception to the search date).

Main outcome(s) Perioperative adverse cardiac events and mortality.

Quality assessment / Risk of bias analysis Randomized controlled trials: Cochrane Risk of Bias 2.0
Observational studies: Newcastle-Ottawa Scale.

Strategy of data synthesis Dichotomous data will be analyzed using risk ratio (RR). Continuous data will be analyzed using Mean Difference (MD) or Standardized Mean Difference (SMD). Heterogeneity will be assessed using I^2 statistic. Fixed-effects model will be used if $I^2 < 50\%$; otherwise, random-effects model will be applied.

Subgroup analysis Predefined subgroups: type of underlying heart disease, surgical category, subtype of regional anesthesia (neuraxial versus peripheral nerve block).

Sensitivity analysis Leave-one-out analysis and exclusion of high-risk-of-bias studies to verify the robustness of pooled results.

Country(ies) involved China.

Keywords Heart disease, General anesthesia, Regional block anesthesia, Adverse cardiac events.

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