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**Preventing postoperative delirium in elective surgery patients using multi-component interventions: A systematic review and meta-analysis of randomized controlled trials**

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**ADMINISTRATIVE INFORMATION**

**Support** - None.  
**Review Stage at time of this submission** - Completed but not published.  
**Conflicts of interest** - None declared.  
**INPLASY registration number:** INPLASY202570072  
**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 July 2025 and was last updated on 18 July 2025.

**INTRODUCTION**

**Review question / Objective** This study aims to systematically evaluate and explore, through meta-analysis, the effectiveness of multi-component interventions in preventing POD among elderly patients undergoing elective surgery.

**Condition being studied** Postoperative delirium (POD) is a common acute cognitive disorder in elderly patients following elective surgery. It not only prolongs hospital stays, increases the risk of postoperative complications and readmission, but may also lead to long-term cognitive decline, significantly reducing patients' quality of life. Currently, various preventive measures exist for POD in elderly elective surgery patients, but single interventions often yield limited effects.

**METHODS**

**Search strategy** ("postoperative delirium"[Mesh]) AND ("elective surgical procedures"[Mesh]) AND "randomized controlled trials"[Publication Type].  
**Participant or population** Elderly patients undergoing elective surgery.  
**Intervention** Multi-component interventions.  
**Comparator** Standard care.  
**Study designs to be included** RCTs.  
**Eligibility criteria** The eligibility criteria were as follows: (1) participants: elderly patients undergoing elective surgery; (2) intervention: multi-component interventions; (3) comparator: standard care; (4) outcome: incidence of POD in both

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groups; and (5) study design: only RCTs were included.

**Information sources** PubMed, EmBase, Web of Science, and Cochrane Library.

**Main outcome(s)** Incidence of POD in both groups.

**Quality assessment / Risk of bias analysis** The methodological quality of each trial was assessed using the Risk of Bias (RoB) tool.

**Strategy of data synthesis** For statistical analysis in this study, we used relative risk (RR) with 95% confidence intervals (CI) to quantify the effect of multi-component interventions versus standard care on POD risk in elderly patients undergoing elective surgery. Given potential heterogeneity across studies in intervention protocols, sample characteristics, and follow-up duration, all pooled effect estimates were calculated using a random-effects model.

**Subgroup analysis** To investigate heterogeneity sources and intervention consistency, we conducted subgroup analyses by country, sample size, mean age, sex distribution, and surgical type, with interaction tests evaluating between-subgroup differences.

**Sensitivity analysis** Sensitivity analysis was performed by sequentially excluding individual studies to verify result robustness.

**Country(ies) involved** China.

**Keywords** postoperative delirium; elective surgery; multi-component interventions; systematic review; meta-analysis.

#### **Contributions of each author**

Author 1 - Xu Yang.

Author 2 - Huachun Zhang.

Author 3 - Sheng Peng.