

## Effects of enhanced recovery after surgery on thyroid and parathyroid surgery patients: a meta-analysis

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Wang, HL<sup>1</sup>; Gou, JX<sup>3</sup>; Jiang, YX<sup>3</sup>.**Corresponding author:**

Hailan Wang

whailan2022@163.com

**Author Affiliation:**

Thyroid surgery center, West China Hospital of Sichuan University.

**ADMINISTRATIVE INFORMATION****Support** - Cross disciplinary cooperation project ZY2016204 of "1 · 3 · 5 Project of Discipline Excellence Development" of West China Hospital of Sichuan University.**Review Stage at time of this submission** - Completed but not published.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202370106**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 26 July 2023 and was last updated on 26 July 2023.**INTRODUCTION**

**Review question / Objective** To systematically evaluate the effectiveness of enhanced recovery after surgery (ERAS) in patients undergoing thyroid/parathyroid surgery.

**Condition being studied** ERAS is a series of optimization measures for perioperative period based on evidence-based medicine to reduce the physiological and psychological trauma stress of patients undergoing surgery and achieve the medical concept and model of rapid recovery, and was first introduced into China in 2007. At present, ERAS is widely used in the perioperative diagnosis and treatment of various diseases, which can reduce postoperative complications, accelerate patient recovery, shorten hospital stay, and reduce medical costs, such as weight loss surgery, upper gastrointestinal surgery, breast reconstruction surgery, gastrointestinal surgery, pancreatic surgery, and urology, and achieved remarkable results.

**METHODS**

**Participant or population** Patients receiving thyroid surgery/parathyroid surgery.

**Intervention** Enhanced recovery after surgery.

**Comparator** Routine care.

**Study designs to be included** Randomized clinical trial.

**Eligibility criteria** Inclusion criteria: (1) Patients receiving thyroid surgery/parathyroid surgery; (2) The intervention was ERAS; (3) The type of study was randomized controlled trial or semi randomized controlled trial; (4) At least one of the following outcomes should be included: complications, length of stay, pain assessment, opioid use, hospital costs, and nursing satisfaction. Exclusion criteria: (1) Review, case report, conference, letter and meta analysis

articles; (2) Animal studies, non randomized controlled studies or studies with wrong statistical methods; (3) Statistics are not available; (4) Similar studies from the same institution.

**Information sources** Pubmed, Embase, Medline and Cochranlibrary; China online journals and China national knowledge infrastructure.

**Main outcome(s)** 3252 patients undergoing thyroid surgery from 10 studies were included in the study. In the fixed-effect meta-analysis of 10 studies, ERAS significantly reduced the incidence of postoperative complications (OR = 0.51, 95%CI = 0.40-0.66,  $P < 0.001$ ), postoperative hospital stay (OR = -0.95, 95%CI = -0.98- -0.91,  $P < 0.001$ ), postoperative pain score (OR = -0.79, 95%CI = -0.90- -0.69,  $P < 0.001$ ) and the proportion of postoperative opioid use (OR = 0.09, 95%CI = 0.07-0.11,  $P < 0.01$ ) in patients undergoing thyroid surgery.

**Quality assessment / Risk of bias analysis** Two researchers independently used the risk bias assessment form provided by Cochrane collaboration network to evaluate: (1) generation of random order; (2) Allocation hidden; (3) Blind method of research object and implementer; (4) Results The blind method of the evaluator; (5) Completeness of outcome index data; (6)The possibility of selectively reporting research results; (7) Other sources of bias. If all the above conditions are met, it will be rated as Grade A, indicating low bias; If some of the above conditions are met, it will be rated as Grade B, indicating moderate bias; If none of the above conditions are met, it will be rated as Grade C, indicating a high degree of bias.

**Strategy of data synthesis** Review Manager 5.3 software was used for meta-analysis. Each effect size is given its point estimate and 95% confidence interval (CI). No statistical heterogeneity ( $P > 0.1$ ), using fixed effects model analysis; If there is heterogeneity ( $P < 0.1$ ), analyze the source of heterogeneity first. If there is no obvious clinical heterogeneity and no definite source of statistical heterogeneity can be found, random effects model analysis can be used; if there is obvious clinical heterogeneity or methodological heterogeneity or incomplete data provided, then perform descriptive analysis. If there is significant statistical heterogeneity due to the different methodological quality of the included studies, low-quality studies can be removed for sensitivity analysis. For dichotomous variables, Mantel-Haenszel method was used for analysis, fixed-quantity effect model, and odds ratio (OR) for

the effect index was selected for analysis. For continuous variables, Inverse Variance analysis, fixed-quantity effect model, and mean difference methods were used for analysis.  $P < 0.05$  was significant difference.

**Subgroup analysis** Effect of ERAS on the incidence of postoperative complications. Effect of ERAS on postoperative pain score. Effect of ERAS on postoperative hospital stay.

**Sensitivity analysis** Not applicable.

**Country(ies) involved** China.

**Keywords** enhanced recovery after surgery, thyroid/parathyroid surgery, postoperative complications, hospital stay, postoperative pain.

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

Author 1 - Hailan Wang.

Author 2 - Juxiang Gou.

Author 3 - Yixue Jiang.