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ADMINISTRATIVE INFORMATION

Support - No sponsors are included in this study.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY2025110043

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 16 November 2025 and was last updated on 16 November 2025.

INTRODUCTION

Review question / Objective This study aims to evaluate and rank perioperative outcomes and bowel function across multiple surgical approaches for Hirschsprung's disease in children using a network meta-analysis.

Rationale There are multiple surgical approaches for Hirschsprung's disease, but no comprehensive ranking based on comparative perioperative efficiency and long-term bowel function. This study uses a network meta-analysis (NMA) to address this gap and inform clinical decision-making.

Condition being studied Hirschsprung's disease is a congenital disorder where nerve cells are missing from the colon and intestine, causing a blockage. The condition led to severe constipation, abdominal swelling, and vomiting. The patients who suffer from Hirschsprung's disease need to be treated with surgery to remove the affected part of the intestine.

METHODS

Search strategy A systematic literature search was conducted following PRISMA guidelines across PubMed, Embase, and the Cochrane Library, from inception to October 31, 2025.

Participant or population Children and infants diagnosed with Hirschsprung's disease and underwent surgeries.

Intervention Nine techniques: Open Soave (OS), Open Swenson (OSw), Open Duhamel (OD), Laparoscopic Soave (LS), Laparoscopic Swenson (LSw), Laparoscopic Duhamel (LD), Transanal Soave (TS), Transanal Swenson (TSw), and Robotic-assisted procedures (Robot).

Comparator Indirect comparisons among all interventions based on the data extracted from the included studies through frequentist network meta-analysis by using MetaInsight.

Study designs to be included Comparative studies regarding all major surgical techniques mentioned above (Soave/ Swenson/ Duhamel) via multiple approaches, including open/laparoscopic/transanal.Comparative studies mentioned.

Eligibility criteria Inclusion of comparative studies focused on surgical approaches for Hirschsprung's disease. Exclusion of non-comparative, non-related to surgical outcomes, and studies of systematic reviews and meta-analyses.

Information sources PubMed, Embase, and the Cochrane Library.

Main outcome(s) Primary outcomes: operative time (OP time), length of stay (LoS), and intraoperative blood loss.

Additional outcome(s) Secondary outcomes: postoperative Hirschsprung-associated enterocolitis (HAEC), constipation, and fecal incontinence.

Data management Data extraction and analysis were conducted through frequentist network meta-analysis by using MetInsight software.

Quality assessment / Risk of bias analysis The Risk of Bias 2.0 (RoB 2.0) tool was used to assess the risk of bias in the included randomized clinical trials (RCTs), and the Newcastle-Ottawa Scale (NOS) for assessing the quality of non-randomized studies.

Strategy of data synthesis Frequentist network meta-analysis with a random-effects model.

Subgroup analysis Systematic reviews focused on subgroups divided by different surgical procedures and approaches, such as Soave vs. Swenson vs. Duhamel procedures, and open vs. laparoscopic vs. transanal vs. robotic approaches.

Sensitivity analysis Sensitivity analysis excluding high-risk bias studies.

Language restriction Only English-language studies were included.

Country(ies) involved Taiwan.

Other relevant information This is the first network meta-analysis to comprehensively compare all major surgical approaches.

Keywords Hirschsprung's disease, Network Meta-analysis, Soave procedure, Swenson procedure,

Duhamel procedure, Minimal invasive surgery, Robot-assisted surgery.

Dissemination plans Planned to submit the abstract to PAPS 2026 and submission to the Journal of Pediatric Surgery (JPS).

Contributions of each author

Author 1 - Hsiao-Chien Ku - drafted the study design, analysis and interpretation, data collection, writing of the article, statistical analysis, and critical appraisal of the studies included.

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Author 2 - Fu-Huan Huang - provided the study concept, results interpretation, statistical analysis, and critical appraisal of the studies included.

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