Prophylactic Negative Pressure Wound Therapy For Closed Abdominal Wounds After Gastrointestinal Surgery: A Systematic Review and Meta-Analysis

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INTRODUCTION

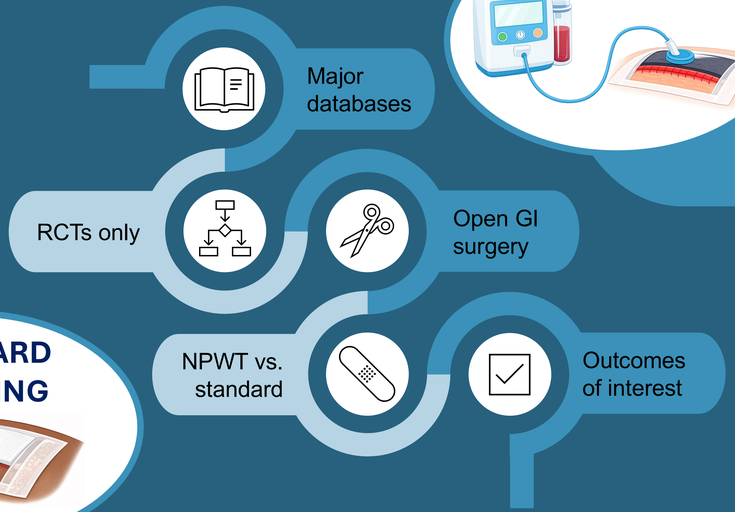
- Despite measures already in place, according to the CDC, surgical site infections (SSIs) continue to rise, making them a major ongoing healthcare and financial concern.
- Negative pressure wound therapy (NPWT) has been studied as an adjunct for wound healing and infection in abdominal surgery, showing varying results.
- Previous systematic reviews have included studies encompassing patients with abdominal surgeries from various surgical specialties. However, abdominal surgeries involving the gastrointestinal (GI) tract **carry a higher risk for SSIs**.

OBJECTIVE

To evaluate the effects of **prophylactic use of NPWT devices compared to standard post-surgical dressings** in patients undergoing open abdominal surgery involving the GI tract only, with incisions closed primarily.

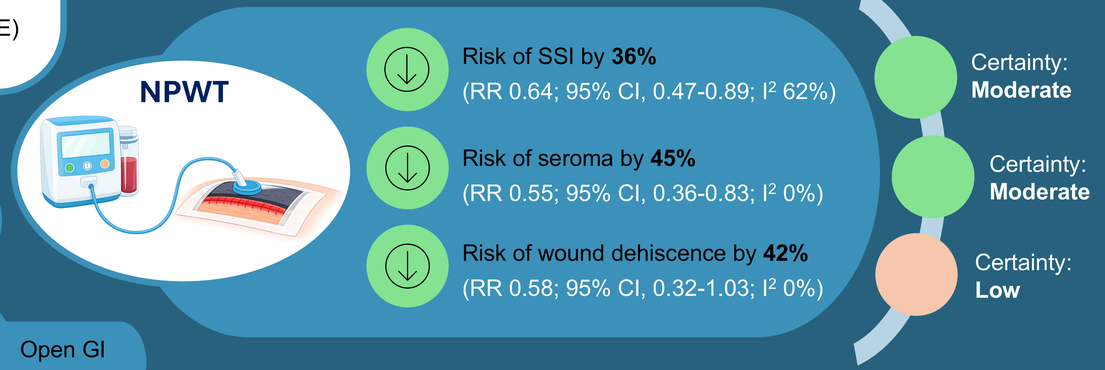
METHODS

- Main outcomes: **Any SSI, seroma and wound dehiscence, within 30 days post-operatively.**
- Meta-analysis: Random-effects model.
- Risk of bias assessment: Revised risk-of-bias tool for randomized trials (RoB 2).
- Certainty of evidence: Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach.



RESULTS

- **1728 unique patients** (871 SSD; 857 NPWT).
- **Nine different countries** (US n=4; Turkey n=1; Italy n=2; Canada n=1; Spain n=2; Poland n=1; Malaysia n=1; South Korea n=1; India n=1), across different socio-economic statuses, in both universal and predominantly private healthcare systems.
- **Fourteen RCTs**: 4 studies focused on HPB surgical patients, 6 on colorectal patients, 1 study on emergency GI surgery, and 3 enrolled a mix of GI surgeries.



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STRENGTHS

- **Comprehensive search strategy**: Multiple databases searched without language restriction.
- **Focused study population**: Reduced heterogeneity by excluding studies with mixed surgical patients.
- **Rigorous methodology**: Performed GRADE assessment and minimized risk of bias by excluding non-randomized studies.
- Together, these features address certain limitations in the existing literature.

CONCLUSION

- Prophylactic NPWT **likely reduces SSIs and seroma formation and may reduce wound dehiscence** after open abdominal GI surgery.
- NPWT devices are not routinely implemented for these wounds.
- Cost-effectiveness analyses of NPWT were not explored in this review but are needed to determine the feasibility of broader adoption.