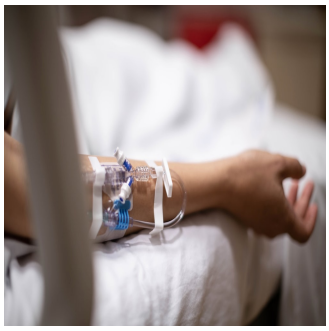
ICU
MANAGEMENT & PRACTICE

SUNRRISE: Negative Pressure Dressings to Prevent SSI After Emergency Laparotomy



Surgical site infections (SSI) occur in up to 40% of patients after emergency laparotomy, leading to delayed healing, wound dehiscence, hernia risk, longer hospital stays, and higher readmission rates. These infections are a significant burden on patients, hospitals, and healthcare systems. Emergency laparotomies are critical for treating conditions like cancer and trauma, making up 9.1% to 21.1% of surgeries in both high- and low-income settings. Patients undergoing these procedures are at high risk for SSIs due to factors like intra-abdominal contamination and higher severity scores.

One potential strategy for preventing SSIs is the use of incisional negative pressure wound therapy (iNPWT), which involves a battery-powered suction pump that applies negative pressure to the closed incision. This method reduces SSIs by removing exudate, increasing blood flow, and promoting healing. While evidence on its effectiveness in abdominal surgeries is mixed, the WHO's 2018 SSI prevention guidelines recommend it for high-risk patients, which is supported by UK guidelines. However, no trials have assessed its efficacy in emergency laparotomy specifically.

The SUNRRISE trial aims to address this gap in evidence. The trial was conducted across 22 UK hospitals and 12 Australian hospitals. It involved adult patients undergoing emergency laparotomy between December 18, 2018, and May 25, 2021. Participants were followed for 30 days after the procedure, with database closure occurring on August 25, 2021. Participants were randomly assigned in a 1:1 ratio to either receive iNPWT (n = 411) or the surgeon's choice of wound dressing (n = 410). Randomisation and the application of the dressing took place in the operating room at the conclusion of the surgical procedure.

The primary outcome of the trial was the occurrence of SSI up to 30 days post-procedure, assessed by an evaluator masked to the randomisation and using CDC criteria. There were seven secondary outcomes, including hospital stay length, postoperative complications within 30 days, hospital readmissions for wound-related issues, wound pain, and quality of life.

A total of 840 patients were randomised in the trial (536 from the UK, 304 from Australia), with a mean age of 63.8 years, and 52% were female. After exclusions, 394 participants from each group were included in the primary analysis. The incidence of SSIs was 28.4% in the iNPWT group and 27.4% in the surgeon's preference group, with no significant difference between the two groups across various subgroups and sensitivity analyses. Of the seven secondary outcomes, six showed no significant differences, including hospital readmissions, quality of life, and length of stay, which was similar between the two groups (median stay of 8 days in the iNPWT group vs. 9 days in the surgeon's preference group).

The SUNRRISE trial found that iNPWT was not effective in reducing SSIs in patients undergoing emergency laparotomy. This result was consistent across all preplanned subgroups and sensitivity analyses. There was a small reduction in wound-related pain at day 7 in the iNPWT group, but the difference was minimal and of uncertain clinical significance. Most secondary outcomes, including hospital readmission and quality of life, showed no significant difference between the groups.

The results challenge earlier WHO recommendations for iNPWT use in high-risk wounds, as a meta-analysis published after the trial began found mixed evidence on the effectiveness of negative pressure dressings in reducing SSIs. SUNRRISE provided valuable data to inform decision-making in emergency abdominal surgeries.

The study also highlighted differences in SSI rates depending on follow-up methods. SSI rates were higher when assessed in person (36% in the iNPWT group and 37% in the surgeon's preference group) compared to video or phone assessments. This raises concerns about the accuracy of SSI detection using remote methods and emphasises the importance of in-person evaluations. Despite the challenges of studying this patient group, the trial's findings align with similar studies, showing an overall SSI rate of around 28% for emergency laparotomy patients.

The study's findings do not support the routine use of iNPWT to reduce SSI in adults undergoing emergency laparotomy.

Source: JAMA
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Published on : Tue, 4 Feb 2025