



## ENHANCED RECOVERY AFTER SURGERY Vs. CONVENTIONAL RECOVERY IN ELECTIVE ABDOMINAL SURGERIES

### General Surgery

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### ABSTRACT

**Background:** Enhanced Recovery After Surgery is a multidisciplinary, evidence-based protocol combined to reduce surgical injury and support speedy recovery. This study evaluates ERAS versus conventional recovery (NERAS) in elective abdominal surgeries. **Methods:** This study was conducted on 278 patients (139 ERAS, 139 NERAS) undergoing elective abdominal surgeries. Pre-, intra-, and postoperative variables were monitored. Interventions included early feeding, minimal drain use, multimodal analgesia, and early mobilization. Data were analysed using Stata MP-17 with chi-square and t-tests. **Results:** ERAS patients had earlier mobilization (POD 0 in 77.6%), faster gut motility recovery, and earlier tolerance of oral feeds (POD 0 in 80.6%) compared to NERAS. Use of bowel preparation and drains was significantly lower in ERAS. Statistically significant improvements were observed in return of bowel function ( $p=0.0019$ ), motion passage ( $p=0.0266$ ), & solid diet tolerance ( $p<0.05$ ). Postoperative nausea and emesis incidence was lower but not statistically significant. **Conclusion:** ERAS significantly improves postoperative recovery in elective abdominal surgeries compared to conventional care. The protocol is safe, feasible, and leads to reduced morbidity and hospital stay. Wider implementation is encouraged.

### KEYWORDS

ERAS, abdominal surgery, postoperative recovery, multimodal analgesia.

### INTRODUCTION

In the field of Colorectal surgery, ERAS is now an integral part & is firmly established as the gold standard for postoperative care, having consistently demonstrated reduction in postoperative complications and accelerated recovery in multiple clinical studies.<sup>[1]</sup>

Pioneered by Professor Henrik Kehlet, the ERAS protocol transformed conventional perioperative care by reducing practices like extended preoperative fasting and routine use of drains. Kehlet proposed that reducing surgical stress improves metabolic response, enhances recovery, and lowers complication rates. This has led to shorter hospital stays and reduced healthcare costs.<sup>[1,2]</sup>

The ERAS protocol traces its origins to 2001, when a coalition of European surgeons including figures like Professors Ken Fearon, Ollie Ljungqvist, and Henrik Kehlet formed the ERAS Study Group to establish standardized, evidence based perioperative pathways for colorectal surgery. Intraoperative focus includes antibiotic use, normothermia, and fluid management. Postoperative care emphasizes early feeding, mobilization, and reduced use of tubes and drains. Together, these strategies improve recovery and reduce complications.<sup>[4-6]</sup>

Applying ERAS principles in abdominal surgery reduces surgical stress, enhances pain control, minimizes opioid use, and speeds up recovery. Patient education and engagement improve compliance and outcomes, even in emergency settings.<sup>[7]</sup>

### AIMS AND OBJECTIVES

This study aimed to compare postoperative outcomes between patients undergoing elective abdominal surgeries managed with ERAS versus conventional recovery protocols.

#### Objectives:

- To evaluate day of mobilization, feeding initiation, feed tolerance, return of bowel function, wound healing, and incidence of PONV.
- To assess ERAS impact on hospital stay and early discharge readiness.
- To identify barriers in implementing ERAS protocols.

### MATERIALS AND METHODS

A randomized controlled trial was carried out in the tertiary care hospital in Ghaziabad, over a duration of one and a half years. A total of 278 patients undergoing elective abdominal surgeries were enrolled and randomized equally into ERAS and conventional recovery (NERAS) groups using the NCI Clinical Trial Randomization Tool.

#### Study Procedure:

Eligible patients scheduled for elective abdominal surgeries were assessed preoperatively and stratified according to the eligibility criteria. Following informed consent, patients were randomly allocated to the ERAS cohort or the NERAS cohort using NCI Clinical Trial Randomization Tool to ensure unbiased allocation.

In the ERAS group, patients underwent preoperative counselling, received carbohydrate loading until 2 hours prior to surgery, while routine mechanical bowel preparation was omitted unless clinically indicated. Intraoperative protocols included goal-directed fluid therapy, normothermia maintenance, and the use of multimodal analgesia to reduce reliance on opioids. Prophylactic antibiotics were administered within one hour of incision. Postoperatively, early enteral feeding was initiated as early as POD 0, drains and catheters were minimized, and mobilization began within 6–12 hours post-surgery.

In contrast, the NERAS group followed conventional perioperative protocols, including prolonged fasting, liberal use of intraabdominal drains, delayed oral intake, and traditional pain control with opioids.

All patients were monitored for postoperative outcomes including time to mobilization, day of first oral intake and tolerance, passage of flatus and motion, incidence of surgical site infection, postoperative nausea and vomiting, and overall recovery.

#### Inclusion Criteria:

- Age 18–80 years
- Elective surgical candidates of both sexes

#### Exclusion Criteria:

- Emergency surgeries
- Immunocompromised patients (without optimization)

- Age below 18 or above 80

Data Collection and Outcomes: Parameters assessed included:

- Day of mobilization
- Feed allowance and tolerance
- Day of solid diet initiation
- Bowel function recovery (flatus and motion)
- Incidence of PONV
- Usage of drains and bowel preparation
- Quality of life and wound healing

#### Statistical Analysis:

Analysed by chi square test.

#### RESULT

This study has assessed 278 patients divided equally into ERAS (n=139) and NERAS (n=139) groups. Multiple perioperative and postoperative parameters were compared using chi-square tests. Below is a summary and interpretation of the findings.

##### 1. Gender Distribution

Gender proportions did not differ significantly between the groups ( $p = 0.531$ ), indicating a balanced gender distribution that likely did not bias the allocations or affect the study outcomes.

##### 2. Carbohydrate Loading

A perfect protocol adherence was noted: 100% of ERAS patients received carbohydrate loading, while none in the NERAS group did. This reinforces strict implementation of preoperative ERAS components.

##### 3. Selective Bowel Preparation

A highly significant difference ( $p < 0.001$ ) was observed, with bowel preparation avoided in nearly all ERAS cases (98.6%) and universally applied in NERAS. This reflects a key contrast between evidence-based and conventional practice.

##### 4. Use of Intra-abdominal Drains

Drain usage was significantly lower in ERAS (66.9% vs. 77.7%,  $p = 0.044$ ), aligning with ERAS objectives to reduce unnecessary invasiveness and promote early recovery.

##### 5. Early Mobilization

The ERAS cohort demonstrated significantly more frequent same-day mobilization (POD 0) compared to controls (77.7% vs. 64.7%;  $p = 0.0242$ ), reflecting successful attainment of an important ERAS objective – early postoperative ambulation.

##### 6. Gut Motility Stimulation

A strong association was found ( $p < 0.00001$ ), with early and more frequent use of rectal stimulation in ERAS patients. Most NERAS patients did not receive any such intervention, suggesting a conservative approach.

##### 7. Day of First Feed Allowed

Feeding on POD 0 occurred in 86.3% of ERAS vs. 64.7% of NERAS patients. The difference was highly significant ( $p = 0.0005$ ), emphasizing early enteral nutrition as a core ERAS principle.

##### 8. Day of First Feed Tolerated

Tolerance was regained more quickly among patients in the ERAS group ( $p = 1.78 \times 10^{-8}$ ), with 80.6% tolerating feeds on POD 0, compared to 44.6% in the NERAS group, showcasing faster gastrointestinal recovery.

##### 9. Day of First Solid Diet Allowed

Most ERAS patients (84.9%) were started on solid food by POD 1 compared to 61.9% in NERAS ( $p < 0.05$ ), reflecting earlier advancement of diet in ERAS and faster return of gut function.

##### 10. Day of First Flatus Passed

Early clinical improvements were observed in a significantly larger % of patients following ERAS protocol experienced early gastrointestinal recovery ( $p = 0.0019$ ), with 67.6% passing flatus on postoperative day 1, compared to 48.2% in the non-ERAS cohort.

##### 11. Day of First Motion Passed

First bowel motion occurred earlier within the ERAS cohort ( $p = 0.0266$ ), with a majority passing stools by POD 2–3 (62.6%

vs. 60.4%). Fewer ERAS patients failed to pass stools during hospital stay (20.1% vs. 17.3%).

##### 12. Postoperative Nausea and Vomiting (PONV)

No significant variation ( $p = 0.522$ ) was found in PONV incidence, indicating that both protocols achieved comparable outcomes in controlling this complication.

Table no. 1 shows comparison of ERAS and NERAS protocol components and outcomes.

#### DISCUSSION

Enhanced Recovery After Surgery protocols utilizes evidence based perioperative strategies to minimize surgical stress and accelerate postoperative recovery. In our study, ERAS implementation led to earlier initiation and better tolerance of oral feeding, with most patients beginning on POD 0. This aligns with Nygren et al<sup>[6]</sup> and Weimann et al<sup>[9]</sup>, who emphasized carbohydrate loading for reducing insulin resistance and improving metabolism.

Selective bowel preparation was avoided in ERAS, consistent with Gustafsson et al<sup>[10]</sup> and Contant et al<sup>[11]</sup>, who found no benefit of routine mechanical bowel prep. Intra-abdominal drains were used less frequently in ERAS, reflecting the recommendations of Basse et al<sup>[12]</sup>, who linked minimal drain use to faster recovery.

Early mobilization was significantly more common in ERAS patients, in agreement with Barberan et al<sup>[13]</sup> and Nelson et al<sup>[14]</sup>, supporting mobilization within 24 hours. Gut motility stimulation was employed in most ERAS cases, reducing ileus risk, as supported by Lassen et al<sup>[15]</sup>.

Early feeding and tolerance were superior in ERAS, echoing Ljungqvist et al<sup>[16]</sup>, Lassen et al<sup>[17]</sup>, and Thiele et al<sup>[18]</sup>, who linked early oral intake to fewer complications and shorter stays. Solid diet initiation was earlier in ERAS patients, supporting findings by Lassen et al<sup>[19]</sup> and Lewis et al<sup>[20]</sup> on the safety and benefits of early solid feeding.

ERAS protocols were associated with quicker return of bowel function, evidenced by earlier passage of flatus and stool, as reported by Gustafsson et al<sup>[21]</sup>, Vardhan et al<sup>[22]</sup> and Scott MJ et al<sup>[23]</sup>. Although the difference in PONV was not statistically significant, ERAS showed a favorable trend, supported by Feldheiser et al<sup>[24]</sup> and Apfel et al<sup>[25]</sup> on the role of multimodal antiemetics and reduced opioid use.

Overall, this study reinforces the growing consensus that ERAS is not only safe and feasible but also superior to conventional recovery in promoting functional recovery, improving patient outcomes, and optimizing perioperative care. Broader adoption of ERAS can be facilitated through institutional guidelines, targeted training, and active auditing of perioperative practices.

#### CONCLUSION

ERAS protocols substantially improve postoperative outcomes in elective abdominal surgeries by enabling faster recovery, reduced complications, and shorter hospital stays compared to traditional care. Implementation of ERAS should be encouraged through institutional support and continuous auditing.

**Table No. 1: Comparison Of ERAS And NERAS Protocol Components and Outcomes**

| Parameter                    | ERAS<br>(n = 139) | NERAS<br>(n = 139) | p-value | Interpretation                |
|------------------------------|-------------------|--------------------|---------|-------------------------------|
| Gender (F:M)                 | 92:47             | 87:52              | 0.531   | No significant difference     |
| Carbohydrate Loading (Yes)   | 100%              | 0%                 | < 0.001 | Significantly higher in ERAS  |
| Bowel Preparation (Avoided)  | 98.6%             | 0%                 | < 0.001 | Significantly avoided in ERAS |
| Intraabdominal Drains (Used) | 66.9%             | 77.7%              | 0.044   | Lower usage in ERAS           |
| Mobilization on POD 0        | 77.7%             | 64.7%              | 0.0242  | Earlier mobilization in ERAS  |

|                                   |       |       |           |                                        |
|-----------------------------------|-------|-------|-----------|----------------------------------------|
| Gut Motility Stimulation by POD 1 | 54.3% | 1.4%  | < 0.00001 | Significantly more in ERAS             |
| Feed Allowed on POD 0             | 86.3% | 64.7% | 0.0005    | Earlier feeding in ERAS                |
| Feed Tolerated on POD 0           | 80.6% | 44.6% | < 0.00001 | Significantly better tolerance in ERAS |
| Solid Diet Started by POD 1       | 84.9% | 61.9% | < 0.05    | Earlier solid intake in ERAS           |
| First Flatus Passed by POD 1      | 67.6% | 48.2% | 0.0019    | Earlier bowel activity in ERAS         |
| First Motion by POD 3             | 62.6% | 64%   | 0.0266    | Slightly earlier in ERAS               |
| Post-op Nausea & Vomiting (PONV)  | 7.2%  | 10.1% | 0.522     | No significant difference              |

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