

Enhanced Recovery After Surgery (ERAS): Role of the AnesthesiologistPradeep Kumar¹, Satyapal Yadav², Rajesh Agarwal³¹Senior Resident, Department of Anaesthesiology, V.R.I.M.S. Chakia East Champaran, Bihar, India²Senior Resident, Department of Anaesthesiology, G.M.C.H. Bettiah West Champaran, Bihar, India³Professor & Head, Department of Anaesthesiology, (DNB) V.R.I.M.S. Chakia East Champaran, Bihar, India

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Abstract:

Background: Enhanced Recovery After Surgery (ERAS) is an evidence-based, multidisciplinary perioperative care pathway designed to reduce surgical stress, maintain physiological function, and accelerate postoperative recovery. Since its introduction by the ERAS Society, ERAS protocols have demonstrated significant reductions in postoperative complications, hospital length of stay, opioid consumption, and healthcare costs while improving patient satisfaction and functional outcomes. The anesthesiologist plays a central and pivotal role in the successful implementation of ERAS programs. Preoperatively, the anesthesiologist contributes to patient optimization through risk stratification, comorbidity management, anemia correction, prehabilitation support, patient education, and appropriate fasting and carbohydrate loading strategies. Intraoperatively, the anesthesiologist ensures goal-directed fluid therapy, maintenance of normothermia, multimodal opioid-sparing analgesia, prevention of postoperative nausea and vomiting, and use of short-acting anesthetic agents to facilitate early recovery and mobilization. Regional anesthesia techniques and ultrasound-guided nerve blocks further enhance analgesia while minimizing systemic opioid requirements.

Postoperatively, anesthesiologists support early extubation, effective pain control, early enteral nutrition, glycemic control, and thromboprophylaxis in collaboration with surgeons, nurses, and physiotherapists. Their leadership in protocol development, audit, and quality improvement initiatives ensures adherence to ERAS guidelines and continuous outcome monitoring.

Conclusion: the anesthesiologist is integral to the success of ERAS pathways, functioning not only as a perioperative physician but also as a coordinator of multidisciplinary care. Active anesthetic management within ERAS protocols significantly enhances patient recovery, safety, and overall surgical outcomes.

Keywords: ERAS, PONV, BMI.**DOI:** 10.25258/ijcpr.18.2.132

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Introduction

Enhanced Recovery After Surgery (ERAS) is a patient-centered, evidence-based approach to perioperative care designed to reduce the physiological stress of surgery and promote faster functional recovery. Originally developed in colorectal surgery by Henrik Kehlet in the 1990s, the ERAS concept has since expanded across multiple surgical specialties, including orthopedics, gynecology, urology, hepatobiliary, and cardiac surgery. The establishment of the ERAS Society further standardized and disseminated ERAS guidelines worldwide. Traditional perioperative care often involved prolonged fasting, liberal intravenous fluid administration, routine use of drains and tubes, delayed mobilization, and heavy reliance on opioids for pain control. These practices were associated with increased surgical stress response, delayed recovery of gastrointestinal function, prolonged

hospital stay, and higher complication rates. In contrast, ERAS protocols integrate multimodal strategies that address each phase of perioperative care—preoperative, intraoperative, and postoperative—aiming to preserve physiological function and enhance recovery. The anesthesiologist plays a pivotal role in the implementation and success of ERAS pathways. As a perioperative physician, the anesthesiologist contributes to patient optimization, evidence-based anesthesia techniques, opioid-sparing analgesia, goal-directed fluid therapy, and early postoperative rehabilitation strategies. Through close collaboration with surgeons, nurses, physiotherapists, and nutritionists, anesthesiologists help ensure adherence to ERAS principles and improve patient outcomes.

This paper explores the evolution of ERAS protocols and highlights the expanding and critical

role of the anesthesiologist in delivering safe, efficient, and high-quality perioperative care within the ERAS framework.

Materials and Methods

Study Design: This prospective observational study was conducted in the Department of Anesthesiology at Virat Ramayan Institute of Medical Sciences Chakia East Champaran, Bihar. and a tertiary care hospital, Study duration is one years.

Study Population: A total of 36 adult patients undergoing elective abdominal surgery under ERAS protocol were included in the study.

Inclusion Criteria

- Age 18–70 years
- ASA physical status I–III
- Elective major abdominal surgery
- Patients willing to participate

Exclusion Criteria

- Emergency surgeries
- ASA physical status IV or above
- Severe cardiac, hepatic, or renal dysfunction
- Known allergy to study medications
- Patients requiring postoperative mechanical ventilation

1. Preoperative Phase

- Pre-anesthetic evaluation and risk stratification
- Patient counseling and education regarding ERAS pathway
- Optimization of comorbidities
- Reduced fasting (6 hours for solids, 2 hours for clear fluids)
- Preoperative carbohydrate loading
- Avoidance of routine sedative premedication

2. Intraoperative Phase

- Standard ASA monitoring

- Balanced general anesthesia using short-acting agents
- Multimodal analgesia (paracetamol, NSAIDs, regional blocks where appropriate)
- Opioid-sparing techniques
- Goal-directed fluid therapy
- Maintenance of normothermia
- Prophylaxis for postoperative nausea and vomiting

3. Postoperative Phase

- Early extubation in the operating room
- Multimodal analgesia with minimal opioid use
- Early oral intake (within 24 hours)
- Early ambulation (within 24 hours)
- Removal of drains and catheters as early as feasible

Data Collection

The following parameters were recorded:

- Demographic data (age, gender, BMI)
- ASA status
- Duration of surgery
- Intraoperative fluid administration
- Postoperative pain scores (VAS)
- Incidence of postoperative nausea and vomiting (PONV)
- Time to first ambulation
- Time to first oral intake
- Length of hospital stay
- Postoperative complications

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using appropriate statistical software. Continuous variables were expressed as mean ± standard deviation (SD), and categorical variables were expressed as percentages. A p-value < 0.05 was considered statistically significant.

Results

Time after operation	How might I feel?	What is safe to do?	Fit to work?
1 - 4 days	<ul style="list-style-type: none"> • You are likely to be in hospital during this time • You will have some pain and discomfort in abdomen • You may feel sore moving in and out of bed • You may have some bleeding like a light period 	<ul style="list-style-type: none"> • Get up and move about • Go to the toilet • Get yourself dressed • Start eating and drinking as usual • You will feel tired and feel like a sleep in the afternoon 	✗ No
5 - 7 days	<ul style="list-style-type: none"> • You should be at home by now • Your pains should be reducing in intensity and you will be able to move about more comfortably • You will still tire easily and may require a nap during the day 	<ul style="list-style-type: none"> • Continue as for days 1 - 4 • Go for short walks • Continue with exercises that have been recommended to you • Wash and shower as normal • Have a rest or sleep in the day if you need to 	✗ No
1 - 2 weeks	<ul style="list-style-type: none"> • There will be less pain as you move about and you will find your energy levels slowly returning • Bleeding should have settled or be very little 	<ul style="list-style-type: none"> • Build up your activity slowly and steadily • Restrict lifting to light loads 	✗ No
2 - 4 weeks	<ul style="list-style-type: none"> • There will be even less pain as you move about more and more • You will find your energy levels are returning to normal • You should feel stronger every day 	<ul style="list-style-type: none"> • Continue to build up the amount of activity you are doing towards your normal levels • You can start to do low-impact sport • Make a plan for going back to work 	✓ Yes, on reduced hours or lighter duties
4 - 6 weeks	<ul style="list-style-type: none"> • Almost back to normal • You may still feel tired 	<ul style="list-style-type: none"> • All daily activities including lifting • Usual exercise. • Driving. • Have sex if you feel ready 	✓ Yes, but not heavy work
6 - 8+ weeks	<ul style="list-style-type: none"> • Back to normal 	<ul style="list-style-type: none"> • Everything 	✓ Yes, including heavy work <small>If you don't feel ready to go to work, talk to your GP or employer about the return to work.</small>

POSTOPERATIVE CARE: BED EXERCISES & MOBILIZATION

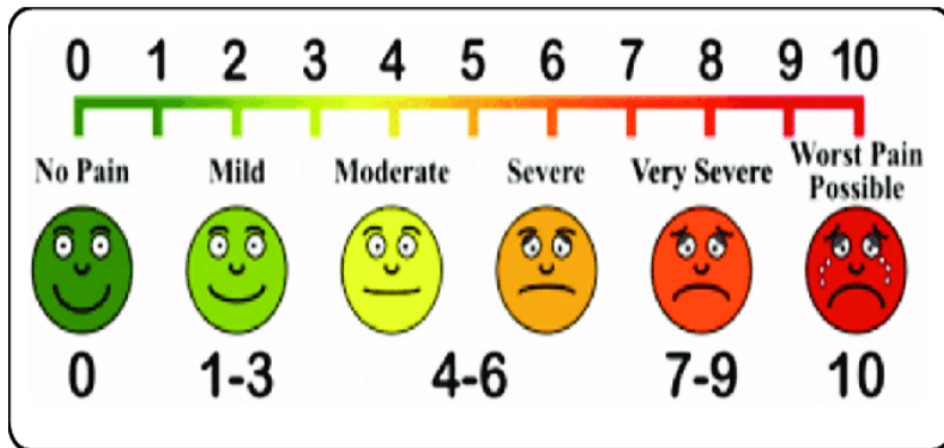


Benefits of early ambulation after surgery

- Helps prevent clot formation
- Stimulates circulation and blood flow
- Improves GI, GU, and respiratory functions
- Improves client's outlook and feeling of independence
- Can relieve pain and increase muscle tone
- Decreases length of hospital stay

Progressive ambulation

Bed exercises	Dangling at bedside	Standing	Walking
<p>Assess client's muscle strength, sensation, and coordination.</p>  <p>Assist client to perform:</p> <ul style="list-style-type: none"> - Foot pumps - Leg lifts - Turning 	<p>Assist client to dangle their feet at the bedside.</p>  <p>Assist client by:</p> <ul style="list-style-type: none"> - Helping them to edge of bed - Guiding their feet over the side of bed - Supporting their balance 	<p>Assist client to standing position.</p>  <p>Assist client by:</p> <ul style="list-style-type: none"> - Asking client to rise on count of 3 - Assisting client to stand - Assessing their balance, any signs of distress or weakness - Asking client to walk in place 	<p>Assist client to ambulate.</p>  <p>Assist client by:</p> <ul style="list-style-type: none"> - Ambulating a short distance - Maintaining grip on gait belt - Having wheelchair or seat available if needed



Demographic Characteristics

A total of 36 patients were included in the study.

- Mean age: 48.6 ± 12.4 years
- Gender distribution: 20 males (55.6%), 16 females (44.4%)
- Mean BMI: 24.8 ± 3.1 kg/m²
- ASA status:
 - ASA I – 14 patients (38.9%)
 - ASA II – 17 patients (47.2%)
 - ASA III – 5 patients (13.9%)

Intraoperative Parameters

- Mean duration of surgery: 118 ± 26 minutes
- Mean intraoperative crystalloid administration: 1,450 ± 320 mL
- All patients were successfully extubated in the operating room.
- Regional anesthesia techniques were used in 22 patients (61.1%) as part of multimodal analgesia.

Postoperative Outcomes

- Mean VAS pain score at 6 hours: 3.2 ± 0.9

- Mean VAS pain score at 24 hours: 2.4 ± 0.8
- Incidence of PONV: 4 patients (11.1%)
- Time to first oral intake: 14.6 ± 4.2 hours
- Time to first ambulation: 18.3 ± 5.1 hours
- Mean length of hospital stay: 3.8 ± 1.2 days

Postoperative Complications

- Surgical site infection: 2 patients (5.6%)
- Ileus: 1 patient (2.8%)
- No cases of deep vein thrombosis, pulmonary embolism, or mortality were reported.

Summary of Findings

Implementation of the ERAS protocol demonstrated:

- Effective postoperative pain control with low opioid requirement
- Low incidence of PONV
- Early mobilization and oral intake
- Reduced length of hospital stays
- Low complication rates

These findings suggest that adherence to ERAS principles contributes to improved perioperative

outcomes and enhanced recovery in patients undergoing elective abdominal surgery.

Discussion

The present study evaluated the impact of an Enhanced Recovery After Surgery (ERAS) protocol in 36 patients undergoing elective abdominal surgery and highlighted the pivotal role of the anesthesiologist in its implementation. The findings demonstrate that adherence to ERAS principles resulted in effective pain control, early mobilization, reduced postoperative complications, and shorter hospital stay. ERAS protocols, originally conceptualized by Henrik Kehlet and later standardized by the ERAS Society, aim to attenuate the surgical stress response and maintain physiological homeostasis. Our study supports these objectives, as evidenced by low postoperative pain scores and minimal opioid requirements. The use of multimodal analgesia, including regional anesthesia techniques, significantly contributed to improved pain control while reducing opioid-related adverse effects such as postoperative nausea and vomiting (PONV). The low incidence of PONV (11.1%) observed in this study may be attributed to prophylactic antiemetic administration and opioid-sparing strategies. Effective perioperative fluid management through goal-directed therapy likely minimized fluid overload and tissue edema, thereby promoting early return of gastrointestinal function. Early initiation of oral intake and ambulation within 24 hours further enhanced functional recovery and reduced the risk of complications such as ileus and thromboembolism.

The mean length of hospital stay (3.8 ± 1.2 days) observed in our study is consistent with existing literature demonstrating reduced hospitalization with ERAS implementation. Early extubation and maintenance of normothermia also contributed to faster recovery and improved patient comfort. The anesthesiologist's role extends beyond intraoperative care. Preoperative optimization, patient education, individualized anesthetic planning, and postoperative pain management are essential components of ERAS pathways. Acting as perioperative physicians, anesthesiologists coordinate multidisciplinary efforts to ensure adherence to ERAS guidelines and continuous quality improvement.

Limitations: This study has certain limitations. The sample size was relatively small (36 patients), and the absence of a control group limits direct comparison with conventional perioperative care. Additionally, the study was conducted at a single center, which may affect generalizability.

Clinical Implications: Despite these limitations, the findings reinforce the effectiveness of ERAS protocols in improving perioperative outcomes. The

anesthesiologist plays a central leadership role in protocol implementation, patient safety, and outcome optimization. Broader adoption of ERAS pathways may contribute to enhanced recovery, reduced healthcare costs, and improved patient satisfaction.

Conclusion

The present study demonstrates that implementation of the Enhanced Recovery After Surgery (ERAS) protocol in 36 patients undergoing elective abdominal surgery resulted in improved perioperative outcomes, including effective postoperative pain control, reduced incidence of postoperative nausea and vomiting, early ambulation, early initiation of oral intake, and shorter hospital stay. Postoperative complications were minimal, and no major adverse events were observed. These findings align with the principles established by the ERAS Society, emphasizing evidence-based, multimodal, and multidisciplinary perioperative care. The anesthesiologist plays a central and indispensable role in the success of ERAS pathways through preoperative optimization, intraoperative physiological management, opioid-sparing analgesia, goal-directed fluid therapy, and facilitation of early recovery strategies. ERAS protocols significantly enhance patient recovery and surgical outcomes. Active leadership and engagement of anesthesiologists in perioperative care are essential for effective implementation and sustained success of ERAS programs. Broader adoption of ERAS principles can contribute to improved patient safety, reduced healthcare costs, and higher overall quality of surgical care.

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