EJMR
ERA'S JOURNAL OF MEDICAL RESEARCH
p-ISSN: 2348-9839, e-ISSN: 2394-5222 | www.ejmr.org

Volume 13 Issue 1
REVIEW ARTICLE

A Review in Gynaecology Enhanced Recovery Protocols: Multimodal Perioperative Care Pathways Improve Patient Outcomes and Shorten Hospital Stays

Saeeda Waseem[1], Mayuri Agrawal[2], Iqra Fatima[3], Irfan Hussain[3], Mariah Cobbin[4], Sonya Kamegni Mombo Nkonda[4]

Received on: 15-03-2026 Published on: 30-04-2026

ABSTRACT

Perioperative management of patients receiving gynaecologic surgery has undergone a paradigm shift in the past decade that has transformed traditional, dogmatic approaches to perioperative care to evidence-based, multimodal pathways otherwise known as Enhanced Recovery After Surgery (ERAS). The extensive analysis in the literature conducted in the current paper reviews the literature published since 2013, providing a complete review of physiological principles, clinical use, and socioeconomic effect of ERAS protocols. Despite the universalism of the principles of ERAS, which may be attenuating the stress response preoperative state in the surgical context and preserving preoperative organ functions, their implementation in the Indian context creates a distinctive environment of adaptation. This report critically reviews information that relates to benign hysterectomy, complex gynaecologic oncology and caesarean sections with the highlight of the dichotomy between international guidelines and resource-constrained realities. Specific attention is given to the specific pharmacologic approaches used in Indian centres, economic justification of these approaches with the help of cost-effectiveness modelling, and sociocultural factors of compliance. The review ratifies the statement that despite the infrastructural difficulties, pragmatic, modified ERAS protocols can be implemented in Indian gynaecologic practice to a considerable extent to decrease the length of stay, morbidity, and healthcare expenses without interfering with patient safety.

KEYWORDS: *Clinical use, Eras's, Healthcare, MIS, Preoperative.*

Era's Journal of Medical Research. 13(1);2026 [doi: 10.24041/ejmr.2026.13]

INTRODUCTION

The Physiological and historical setting: Professor Henrik Kehlet introduced the idea of Fast-Track Surgery, which is now known as Enhanced Recovery After Surgery (ERAS) in the 1990s. His overriding hypothesis was that the delayed post-operative recovery did not arise as a necessary consequence of surgery, but a display of the catabolic hormones cortisol, glucagon and catecholamines, combined with a simultaneous lack of response to anabolic insulin, leading to hyperglycaemia, protein catabolism and immunosuppression, which is a response of the body to a severe trauma.

Gynecologic surgery treatment was traditionally conservative in nature, including lengthy preoperative fasting (Nil Per Os or NPO), mechanical bowel preparation (MBP), liberal intraoperative fluids, as well as delayed postoperative feeding. These measures were aimed at protecting the patient but backfired: long periods of starvation during fasting increased glycogen depletion and insulin resistance in the postoperative period, the excessive use of fluids during starvation caused salt and water retention, leading to intestinal oedema in the patient and ileus, high-dose opioids as analgesia agents triggered sedation, nausea and further intestinal paralysis.[1]

[1]Senior Consultant, Nova IVF Infertility, Lucknow, UP, India.
[2]Department of Pathology, Era's Lucknow Medical College and Hospital, Era University, Lucknow, UP, India.
[3]Medical UG, Era's Lucknow Medical College and Hospital, Era University, Lucknow, UP, India.
[4]American University of Barbados, School of Medicine, Wildey, Saint Michael, Barbados.
Corresponding Author: Saeeda Waseem
Email: saeedawasim@gmail.com
How to cite: Waseem S, Agrawal M, Fatima I, Hussain I, Cobbin M, Nkonda SKM. A Review in Gynaecology Enhanced Recovery Protocols: Multimodal Perioperative Care Pathways Improve Patient Outcomes and Shorten Hospital Stays. Era J Med Res. 2026;13(1):64-72.

The ERAS Society has codified guidelines to reverse such trends over the last twelve years, first to colorectal surgery and then to gynaecologic oncology and benign gynaecology. The fundamental principles of these guidelines which include preoperative counselling, carbohydrate loading, minimally invasive surgery (MIS), multimodal opioid-sparing analgesia and early mobilisation are set to ensure the patient remains in a physiologic steady state.[2]

The introduction of ERAS in India has taken a different trend. The healthcare system of India is marked by the presence of the sharp dichotomy between world-class tertiary centres of the healthcare system that focus on the people who are rich and those on medical tourism and the enormous and over-stretched state sector which focuses on the majority of the population. In both environments, the pressure to have ERAS is high but is motivated by different metrics. The case regarding the importance of patient satisfaction and the so-called concierge care in the private sector versus the imperative of meeting the high demands of surgical waiting lists in the context of an exorbitant patient turnover in the public sector is examined in this review to understand how Indian gynaecologists were able to implement the principles of global ERAS to operate in such heterogeneous clinical settings.

Development of Global and Regional Guidelines

Gynaecology has led the way in standardisation of perioperative care through the periodic publication of consensus guidelines. The deviations and adaptations that one can observe in the Indian data can only be appreciated through the in-depth understanding of the global baseline.

- The ERAS Society Framework: In the 2016-2023, the ERAS Society published new guidelines, targeted at the gynaecologic oncology, vaginal surgery and caesarean delivery and thus created the so-called gold standard, which local implementations are compared to.
- 2019 Update: This release has stressed the inclusion of Minimally Invasive Surgery (MIS) as an essential part of ERAS because although ERAS is beneficial in laparotomy, the combination of ERAS and laparoscopy produces the most desirable outcomes.
- 2023 Update: This revision had to deal with the implementation gap, which admitted that it is not always optimal to follow the entire protocol. It highlighted organisational factors, audit procedures, and need of a multidisciplinary team (MDT) which includes surgeons, anaesthetists, nurses, and dietitians.
- 2025 Recommendations: The recent consensus statements related to emergency laparotomy and colorectal surgery have impacted the practice of gynaecology, especially as far as metabolic handling of an emergency surgical situation is concerned.[3-6]

Indian Adaptations and Consensus

How these guidelines have been taken in India has been keen but skeptical. Institutional review boards and professional bodies are strongly suggesting modified ERAS protocols. The key change is simplification of the interventions that are of high resource. An example of this is that whereas Western practice suggests preoperative carbohydrate drinks based on maltodextrin, Indian practice has demonstrated the equivalent metabolic value of local clear sweet liquids or urine-commonly found glucose water at a fraction of the cost of the technology needed to support Goal-Directed Fluid Therapy (GDT), including either esophageal Doppler, or pulse-contour analysis.[7,8]

METHODOLOGY

A structured literature search was conducted. The primary databases accessed included PubMed, MEDLINE, Embase, and the Cochrane Library.

Review of Literature

The recent decade of literature reflects the definite trend of skepticism to the general recognition of Enhanced Recovery After Surgery (ERAS) protocols in gynaecology.

Global Perspective: Initial significant research (2013-2016) was aimed at defining the safety. Nelson et al., and later guidelines (2019) have also proven that ERAS is the standard of care in gynaecologic oncology. Such studies proved that restrictive fluid therapy and opioid-sparing analgesia were able to shorten length of stay up to three days during open surgeries. The recent international statistics (2023-2025) has moved to Planned Early Discharge, and the research by Kuznicki et al. has shown that even on the Postoperative Day 1 it is safe to release patients who have undergone major laparotomy when strict opioid-sparing anesthesia is utilized.

The Indian Landscape: ERAS Indian literature has expanded greatly since 2018. The first were usually single-center pilots in corporate hospitals, but within the past years, we have witnessed strong randomized controlled trials provided by government institutions.

Bahadur et al. (2021): A landmark randomized controlled trial was conducted by 180 women randomized to the ERAS or conventional care in AIIMS Rishikesh. The research presented Level 1 evidence that ERAS can be implemented even by a public sector where it has a significant effect of reduction of hospital stay and quality-of-life rating.

Sinha et al. (2023): The article was published in the Journal of Minimal Access Surgery and it compared 204 patients (100 pre-ERAS, 104 ERAS), conducted in Apollo Health City, Hyderabad. The research played a critical role in proving that ERAS practices are equally safe in benign surgery (hysterectomy/myomectomy) and that there is no harm of removing the catheter early.

Sudha T.R. et al. (2025): A more recent cross-sectional study published in Karnataka has given important information on the economic value of ERAS in government hospitals, which gives a breakdown of cost savings in Indian rupees (INR).

Patel et al. (2022): The article on the robotic gynaecologic oncology in Gujarat originated a new idea of the so-called Same-Day-Discharge (SDD) as a concept within the Indian situation and challenged the previously existing culture-dependent notion of Indian postoperative treatment.[9-14]

Data Synthesis

Given that the studies were rather heterogeneous, consisting of single centers pilots in rural hospitals, and multi-centers randomized controlled trials in metropolitan hubs a narrative synthesis was used. The review clearly incorporates qualitative knowledge related to barriers of implementation to present a broad picture of the Enhanced Recovery After Surgery (ERAS) environment.

Preoperative Optimization

Fast Breaking the preoperative stage determines the physiology course of the whole surgical admission. The cultural factors in the Indian environment that strongly affect this stage are the cultural beliefs about fasting and nutrition. Fasting Guidelines and Carbohydrate Loading

- Fasting Guidelines and Carbohydrate Loading: The greatest departure on the conventional Indian surgical practice is the losing of the NPO since midnight. Fear of aspiration during the state of anesthesia operative practice resulted in traditional teaching that required long periods of fasting that were many times extended to 12-14 hours owing to the operational room schedule delays. ERAS guidelines used in centres in India (e.g. AIIMS Rishikesh, Tata Memorial) have successfully added some rules that permit solids to up to six hours and clear fluids to up to two hours before induction.
- Physiological Impact: Extended fasting leads to the depletion of hepatic glycogen and the body is forced to utilize gluconeogenesis and lipolysis thus triggering the catabolic state before the first incision is done. The reduction in preoperative thirst, hunger and anxiety and the prevention of postoperative insulin resistance have been proven to be caused by shortening the fasting window, which is shown to be quite effective in reducing the postoperative glucose profile and improving the levels of patient satisfaction as was shown in a 2025 study conducted in Karnataka. Indian studies have confirmed the significant reduction in preoperative glucose profile alongside a higher satisfaction score in the postoperative period compared to the NPO group caused by the shortening of the fasting window.
- Challenge: In spite of evidence compliance is still a challenge. It has been suggested that this is due to problems with logistics that is the ward nurses do not wake their patients and make them take fluids at 5 am or that the anaesthesiologists are terrified of cases being cancelled should they not strictly note that it was NPO.
- Bowel Preparation: Mechanical Bowel Preparation (MBP) is an established practice in India since all major gynaecologic surgeries are now performed with mechanical bowel preparation due to the presumption that this decreases the chances of anastomotic leakage and enables easy surgical manipulation. Nevertheless, as it is regularly highlighted in literature considered, MBP causes dehydration, electrolyte disturbance, and distress to patients without decreasing the infection rate. Current Indian RCTs in the field of benign gynaecology have generally left MBP to cases of high-suspicion of bowel resection (e.g., Stage III/IV ovarian cancer). Even in such complicated matters, the tendency is to no prep or minimal prep, which is justified by the evidence that missing out on MBP does not raise the incidences of surgical site infections and anastomotic leaks in gynaecologic oncology.
- Patient and Family Counselling: This is a complicated problem, where counsellors must have special knowledge about these people, their culture as well as their social context. In Western model, the preoperative counselling is patient-centered. In India the family unit (attendants), takes up an important part in the postoperative care frequently replacing the nursing role of feeding and assistance in getting the mobile taking into consideration the staffing ratios. The ERAS programmes in India that were successful have incorporated family counselling in the pre-operative process and have trained the support group of the patient on the need to mobilise and feed early. The given approach to the role of family in the ERAS is called the Family-Integrated ERAS and has been pointed out as one of the main facilitators of cultural resistance towards the fast-track ideas.[15-20]

Intraoperative Management: Anesthesia and Fluid Strategy

Anesthesia and Fluid Policy: Intraoperative phase of ERAS is characterised by the reduction of surgical stress using anaesthetic decisions and fluid management.

The Change to Regional and Opioid Sparing Anesthesia: Through the use of long acting opioids (morphine), standard general anaesthesia (GA) is linked to delayed recovery, respiratory depression as well as postoperative nausea and vomiting (PONV). Opioid Sparing Anaesthesia (OSA) has been widely examined in the Indian studies.

Regional Techniques: Transversus Abdominis Plane (TAP) block usage has become a part and parcel of the Indian ERAS guidelines in abdominal hysterectomies as well as in caesarean section. A randomised controlled trial comparing TAP blocks to standard analgesia has concluded that TAP group started off with lower pain score and minimised opioid intake during first 24 hours than GA. Likewise, TAP type of spinal anaesthesia is commonly used in vaginal and certain laparoscopic surgeries and it offers an advantage of a clean clearer headache recovery period than GA.

Pharmacologic Innovations (Opioid 0free Anaesthesia): The last meta-analyses and trials have tested the effectiveness of non-opioid adjuvants.

- Dexmedetomidine: The evidence shows that intra-perioperative infusion of dexmedetomidine which is an α 2 agonist, decreases anesthetic needs and does not affect respiratory depression, which serves as a useful agent in the Indian armamentarium.
- Ketorolac and NSAIDs: IV NSAIDs intraoperative should be part of the Indian protocols to pre-empt inflammatory pain. The highlighted network meta-analysis indicated that dexmedetomidine and ketorolac regimens gave a significantly reduced risk of opioid-related PONV than oxycodone-based regimen.[21-24]

Goal-Oriented Fluid Therapy (GDT) versus Restrictive Fluid Therapy

Bowel oedema and delay in the restoration of gastrointestinal function are the results of fluid overload. Although international standards suggest the use of cardiac-output scales to determine GDT its equipment is too expensive to purchase in most of the centres in India. Thus, Indian scholars have confirmed protocols of Restrictive Fluid Therapy which is based on calculated fluid maintenance (e.g., 1-3 ml/kg/h) instead of aggressive replacement. An Indian comparative landmark study indicated that the patients in the ERAS arm (restrictive fluids) did not get any intravenous volume as compared to the control group (liberal fluids). This decreased time to first flatus and hospitalized length were associated with this reduction and indicated that a restrictive disciplined protocol is a safe and effective alternative to costly GDT in the event of gynaecologic surgery when no advanced monitoring is used.[25,26]

Minimally Invasive Surgery (MIS): This is the method whereby there is less incision and less tissue destruction when carrying out major surgeries. The use of laparoscopic and robotic surgery is a primary motivation of improved recovery. The Indian data attest that ERAS protocols help to enhance the benefits of MIS. ERAS use in a case-control study of laparoscopic hysterectomies decreased the length of stay of already short baseline to 1.8 on average days.6 Nonetheless, a large part of gynecologic oncology in India is still done through laparotomy since the disease has already presented itself. More importantly, the literature shows that ERAS offers the most significant relative benefit in this type of laparotomy patients to reduce the immense physiological trauma of open surgery.[27,28]

Postoperative Management

The focus of the postoperative phase is on the fast recovery of normal functioning.

Multimodal Analgesia: The Indian Pharmacopoeia

Indian Enhanced Recovery After Surgery (ERAS) protocols of pain management differs with the Western paradigms since the regulatory framework and logistics associated with opioid prescription is different.

- The Role of Tramadol: Although increasingly the Western guidelines are de-prioritising weak opioids, Tramadol still forms the basis in Indian postoperative analgesia. It is fairly simple to obtain economical and removes the high licensing demands of narcotics that agents like Morphine or Fentanyl carry. Indian guidelines use a combination of Paracetamol (1g IV) with Tramadol (50-100mg IV/IM) and non-steroid anti-inflammatory drugs (NSAIDs, e.g., Diclofenac), which is a regimen.
- Tapentadol vs. Tramadol: Tapentadol is a dual-mechanism analgesic which has been investigated as a potentially better alternative due to less gastrointestinal adverse effects as a mu-opioid receptor agonist a norepinephrine reuptake inhibitor. A comparative analysis undertaken in northern India established that despite the fact that tapentadol is effective in analgesia, the increased cost prevents its extensive use against Tramadol.
- NSAID Safety: There have been concerns on the use of NSAIDs and leakages of the anastomotic in the cases of bowel resections. However, there has been an overall agreement among the Indians that could support the use of Diclofenac in non-bowel gynaecologic surgeries due to its strong opioid-sparing effect that would enable early mobilisation.[29-31]
- Premature feeding and GI Dynamics: The conventional approach did not resume oral intakes until the onset of bowel motions, a pattern that often left the patient NPO 48-72 hrs. ERAS guidelines upset this paradigm by commencing clear liquids 4-6 hours after surgical operations and solid foods on Postoperative Day (POD)1.
- Chewing Gum: Sugar-free chewing gum administration is a low-cost and easy-to-deliver intervention that is commonly used as an Indian protocol (sham feeding) to activate cephalic-vagal mechanisms and prevent postoperative ileus. It has been proved through empirical studies to reduce the time to first flatus significantly.
- Results: Indian cohort study found that early feeding in the ERAS system had the advantage of 1.13 days to solid diet consumption in contrast to 2.57 days in the control group and did not increase the nausea rate and vomiting.[32,33]

Preoperative Mobilisation and Urethral Catheter Removal

The most labour-intensive ERAS component is called early mobilisation. The Indian protocols are to mobilise out of bed within 68 hrs of surgery, and this is aided by the prompt removal of urinary catheters (usually at 612 hrs or on POD 1).

- Effects: In a Karnataka study 100 % of patients with ERAS were able to walk within 24 hours of surgery whereas among the pre-ERAS patients this figure is 57.8 %.34
- Catheterisation: Long catheterisation is a big impediment to mobilisation. Evidence suggests that

timing of catheter removal at 6 -12 hrs after surgery (even post-hysterectomy) has no impact on the occurrence of urinary retention but significantly enhances dignity and mobility of the patient.[35]

Clinical Outcomes: Effectiveness and Safety

The compilation of the data is a strong argument in favour of the effectiveness of ERAS in the Indian population.

- Shortening of Length of Stay (LOS): The decrease in LOS stands out as the one and the same conclusion in all the studies.
- Benign Surgery: ERAS decreased the average LOS in laparoscopic hysterectomies and myomectomies by between 1.2 to 2.1 days. A study brought out a drop to 1.73 days in the ERAS as compared to 2.97 days in controls.
- Oncology: In major oncologic surgical operations the decrease is even more significant regarding the use of resources. The meta-analysis of the gynaecologic oncology outcome regarding the involvement of the appropriate data indicated a reduction in LOS of 1.64 days on average.

Complications and Readmissions

It is important to recognize complication and readmissions in the hospital. One criticism that is related to fast-track surgery is that the complications can be missed which leads to more readmissions, however, the situation is not the same in India.

- Safety: The studies presented by several randomized controlled trials such as AIIMS and other tertiary centres indicate no significant readmission rates between the ERAS and the control groups.
- Morbidity Reduction: ERAS groups always report a lower overall complication rate (13.3 -31.1 in a major study). In particular, cases of paralytic ileus and wound infections are decreased, and this may be explained by the fact that the nutritional status and tissue oedema levels are improved.
- Specific Symptoms: Granular data show significantly less urinary complaints (burning micturition, retention) in EDs where catheters were removed earlier (3.8, 8, respectively) and this factor is directly connected to catheter removal.

Intended Premature Discharge in Oncology

One of the advanced research frontiers will be Planned Early Discharge (POD 1) of major gynecologic malignancies. In a feasibility study of laparotomy discharge on POD 1, when a stringent ERAS protocol, including opioid-sparing anaesthesia was followed it was found that about 73.6% of patients would be able to be sent home the day following surgery without increasing readmissions and Quality of Life (QoL) scores at 2 and 6 weeks. This observation refutes the traditional assumption that open oncologic surgery requires one to stay in the hospital at least one week.[36-38]

Ergonomic ERAS: The Caesarean Section Expertise

Though different to gynaecology, the applied extension of ERAS to the Caesarean Sections (CS) is abundant of principles and is an emerging sphere in India, with the CS being very common in the urban centres.

The mERCD Protocol: Indian institutions have developed new protocols of modified Enhanced Recovery after Caesarean Delivery (mERCD) which focus on:

- Early Oral Fluids: Fluids should be started at an early stage of 2-4 hours after surgery.
- Analgesia: A course of paracetamol and tramadol, without spinal morphine to reduce pruritus and nausea.
- Gum Chewing: This is applied to increase the speed of bowel movement.

Outcomes: A randomized controlled trial comparing ERAS with standard care in case of emergency Caesarean section revealed that ERAS was significantly better in the improvement of the maternal outcome. Among the major results were the lower score of pain (VAS), earlier onset of breastfeeding (a crucial obstetric parameter), and more maternal satisfaction. CS interventions Economic modelling also highlights that recovery pathways optimization is a cost-effective approach to Indian health system.[39,40]

The Implementation Science: Barriers and Facilitators

The fact that ERAS has not been universally adopted does not have strong evidence, but its comprehension is not any less important than clinical data. A triad of barriers of the region is characterized by qualitative studies in terms of Structure Process Outcome.

The shortage of medical resources and personnel is the most common reason indicated. The lack of specific nurses that apply to the ERAS in the hospitals of the publics presupposes that the observation of compliance (e.g., the consumption of carbohydrate drinks) is frequently overlooked.

Minimal availability of specific "recovery units/step-down facilities may slow discharge in case there are no guarantees of the surgeon of the patient in his or her home environment.

Process Barriers

Resistance to Change: The barrier to the resistance is the concept of outdatedness. The older surgeons might not be willing to forego mechanical bowel preparation or extended fasting since they see them as safety nets. This resistance is often based on the fear of a lawsuit or trouble.

Communication: There is a lack of multidisciplinary collaboration between surgeons, anaesthetists, and nurses (the so-called silo effect) in providing ERAS. These hierarchies should be broken down to effect its implementation.

Outcome Barriers

Compliance: It is a recurring theme that there is a difference between protocol prescription and compliance. The research has shown that the level of compliance decreases significantly in the post-operative period (mobilisation, fluid restriction) as opposed to the pre-operative period.

Patient Factors: Non-compliance is likely to occur in case of low health literacy. Patients can also equate good care with bed rest and IV drips thus opposing early mobilisation and oral feeding.[41]

Health Economics: The Value Proposal

In the developing economy, the economic aspects of medical treatments prevail. ERAS offers a good economic case concerning India.

- Cost Reduction Analysis: The retrospective research on hospital bills proves that ERAS saves a significant amount of money in terms of care expenses.
- Magnitude of Savings: One study showed that the total cost was reduced by 17% per patient, which is a savings of approximately US 2,000 in international terms, which is such a significant figure in terms of purchasing power parity in India.
- Savings Drivers: Savings are mainly motivated by lowering the hotel costs (fewer bed days), lowering the pharmacy costs (less use of opioids and antibiotics), and lessening the use of laboratory.
- Cost -Effectiveness Modelling: The Gross Domestic Product (GDP) per capita is a cost-efficiency criterion used to economic model obstetric and gynecologic treatment in India. Analysis of the strategies that can be used to enhance surgical outcomes (both CS rates and access to care) revealed that interventions that maximise the use of resources such as ERAS are very cost-effective with incremental cost effectiveness ratios (ICERs) significantly less than the GDP.[42-44]

ERAS is an effective way of enhancing the functional capacity of Indian hospitals by reducing length of stay (LOS). A hospital with a five-day average LOS can theoretically increase number of patients to be treated by 40 percent with the same number of available beds, an approach which will alleviate the extreme lack of surgical access in the country.

DISCUSSION

The analysis of the data regarding the 12-years of past gives a definite answer: ERAS is not just a Western fad but a need of the Indian healthcare system. ERAS has been modified in India, which can be described as pragmatic in nature the use of tramadol as a substitute of thoracic epidural and glucose water as a substitute of maltodextrin and clinical monitoring as a substitute of oesophageal Doppler.

Compliance-Outcome Association: The data highlights the dose-response relationship of compliance and outcomes. A protocol adherence (>80 -90) that is high is linked to the shortest length of stay and the least number of complications. The implication of this is that the advantages of ERAS are not additive, it is not possible to selectively pick only the items that are readily applicable (including early feeding) and not the more difficult items (including fluid restriction and mobilisation) and expect them to work better.

The implication of Technology and Education: The future initiatives should take advantage of technology to avoid implementation barriers. Patient monitoring and education mobile applications as proposed in certain correspondence would help fill the nursing ratio gap by enabling the patients to monitor their recovery themselves. Moreover, the nurse and resident medical education should be revised to consider the ERAS principles, thus opposing the ideas of outdated concepts in the grassroots level.[45,46]

Research Limitations and Future prospective

Limitation

Methodological constraints often hamper the generalizability of Gyn-ERAS results. Many of the published studies use cohort designs, which compare interventions with historical controls, thus undermining the evidence base. Ljungqvist, et al., Wieslander, et al. Furthermore, the protocol heterogeneity is high in research as dissimilar institutions define and measure main ERAS components differently. Wieslander et al, Ferrari et al.

More importantly, there is properly reported gap in the measurement of long-term results. Value assessment would require objective measures of functional recovery that are sustained, long-term quality of life, and especially in the case of oncology patients the impact on Return to Intended Oncologic Therapy (RIOT). Wieslander et al, Smedley et al., Li et al.

Future prospective

Gyn-ERAS development in the future is increasingly moving more toward reactive response to surgery than progressive optimization of physiological reserve in a patient before the procedure a paradigm also known as Prehabilitation (P-ERAS).

Incorporation of Multimodal Prehabilitation: Gynecologic surgery is one area that causes significant physiological stress which often worsens underlying frailty. Gustafsson et al. Prehabilitation involves multimodal approach that is planned in order to increase the baseline functional performance and health status before the insult of the operation. Smedley et al. Gustafsson et al., Li et al.

P -ERAS programs are usually the combination of physical therapies, personalized nutritional care, and psychological interventions. Gustafsson et al, Li et al. The early results of this combined method have shown that P-ERAS is effective

in improving the postoperative recovery, lessening the occurrence of complications, and raising the speed at which gastrointestinal functional recovery takes place. Smedley et al. Gustafsson et al. The increased awareness of preoperative frailty also forces the future Gyn ERAS implementation strategies to identify the correct target populations and create the strictly designed prehabilitation programs. Smedley et al., Gustafsson et al.

Capitalizing on Digital Health and Telemedicine: The decrease in length of stay in hospitals attained by the use of Gyn -ERAS requires a concerted follow-up after discharge. Li et al. The preoperative phase may be made efficient with the help of telemedicine, where preoperative counseling, comorbidity management, and adherence monitoring to prehabilitation guidelines can be managed. Grisell et al, Li et al. After that the continuous monitoring is provided by remote monitoring platforms and patient-reported outcome (PRO) tracking systems. Li et al. The most important aspect of telemedicine in abdominal and pelvic surgery is its ability to fasten the early detection of complications after the surgery. Li et al.

Target Long-term and Functional Outcomes: The future outcome research should go beyond traditional morbidity and mortality rates to fully determine the worthiness of ERAS. Studies need to be able to pre-empt objective measures of functional recovery, overall symptom burden assessment, and quality-of-life measures in the long run. Smedley et al., Li et al. In gynecologic oncology, the change in the outcome measurement of Return to Intended Oncologic Therapy (RIOT) is a crucial parameter that needs to be measured using ERAS to prove the actual oncologic value, Smedley et al., Li et al.[47-58]

CONCLUSION

Enhanced Recovery Protocols application in gynaecology is one of the most significant changes in perioperative care in the Indian subcontinent. These protocols have proven to be not only viable and safe but also significantly decrease the length of stay in hospitals and the costs borne, both in benign and oncologic gynecologic surgical procedures.

Although the physiological principles are the same as in the whole world, the Indian variant of ERAS is peculiar, as it focuses on opioid-sparing regimens including Tramadol and non-steroidal anti-inflammatory medications, practical fluid administration, and family-based care frameworks. The major challenges to a large-scale adoption the infrastructural deficits and cultural barriers are like a major problem but can be overcome by providing specific education and involving multidisciplinary teams.

ERAS is a potent tool and as India faces an increasing impact of a burden of gynecologic disease it can be used as a strategic tool to streamline healthcare provision. The further work should be geared towards no longer demonstrating the concept, but instead to scale it so as to make the benefits of enhanced recovery available to the women across the entire health-care system.

REFERENCES

1. Kehlet H. Enhanced Recovery After Surgery: A Review. JAMA Surg. 2017;152(3):292-298.
2. Nelson G, Altman AD, Nick A, et al. Guidelines for pre- and intra-operative care in gynecologic/oncology surgery: Enhanced Recovery After Surgery (ERAS®) Society recommendations—Part I. Gynecol Oncol. 2016;140(2):313-322.
3. Nelson G, Bakkum-Gamez J, Kalogera E, et al. Guidelines for perioperative care in gynecologic/oncology: Enhanced Recovery After Surgery (ERAS) Society recommendations—2019 update. Int J Gynecol Cancer. 2019;29(4):651-668.
4. Nelson G, Fotopoulou C, Taylor J, et al. Enhanced recovery after surgery (ERAS®) society guidelines for gynecologic oncology: Addressing implementation challenges – 2023 update. Gynecol Oncol. 2023;173:58-67.
5. Gustafsson UO, Rockall TA, Wexner S, et al. Guidelines for perioperative care in elective colorectal surgery: Enhanced Recovery After Surgery (ERAS) Society recommendations 2025. Surgery. 2025;184:109397.
6. Peden CJ, Aggarwal G, Aitken RJ, et al. Enhanced Recovery After Surgery (ERAS®) Society Consensus Guidelines for Emergency Laparotomy Part 3: Organizational Aspects and General Considerations for Management of the Emergency Laparotomy Patient. World J Surg. 2023;47(8):1881-1898.
7. Bhandoria GP, Bhandarkar P, Ahuja V, et al. Enhanced Recovery After Surgery (ERAS) in gynecologic oncology: An international survey of peri-operative practice. Int J Gynecol Cancer. 2020;30(10):1471-1478.
8. Bahadur A, Kumari P, Mundhra R, et al. Evaluate the Effectiveness of Enhanced Recovery After Surgery Versus Conventional Approach in Benign Gynecological Surgeries: A Randomized Controlled Trial. Cureus. 2021;13(7):e16527.
9. Nelson G, Bakkum-Gamez J, Kalogera E, Glaser G, Altman A, Meyer LA, et al. Guidelines for perioperative care in gynecologic/oncology: Enhanced Recovery After Surgery (ERAS) Society recommendations—2019 update. Int J Gynecol Cancer. 2019;29(4):651-668.
10. Kuznicki ML, Yasukawa M, Mallen AR, Lam C, Eggers E, Regis J, et al. Feasibility and safety of planned early discharge following laparotomy in gynecologic oncology with enhanced recovery protocol including opioid-sparing anesthesia. Front Surg. 2023;10:1279907.
11. Bahadur A, Kumari P, Mundhra R, Ravi AK, Chawla L, Mahamood M, et al. Evaluate the Effectiveness of Enhanced Recovery After Surgery Versus Conventional Approach in Benign Gynecological Surgeries: A Randomized Controlled Trial. Cureus. 2021;13(7):e16527.
12. Sinha R, Verma N, Bana R, Kalidindi N, Sampurna S, Mohanty GS. Intra- and post-operative outcomes in benign gynaecologic surgeries before and after the implementation

of enhanced recovery after surgery protocols: A comparison. J Minim Access Surg. 2023;19(1):112-119.

13. Sudha TR, Paul N, Kampli C, Banapurmath SB. Effectiveness of enhanced recovery after surgery protocol in major gynecological surgeries: a cross-sectional study. Int J Reprod Contracept Obstet Gynecol. 2025;14(10):3281-3288.
14. Patel V, Rajanbabu A, Anandita A, Appukuttan A. A prospective observational study assessing the feasibility and factors affecting same-day discharge in patients undergoing robotic-assisted surgery for gynecological cancers. J Robot Surg. 2022;16(4):881-887.
15. Bahadur A, Kumari P, Mundhra R, et al. Evaluate the Effectiveness of Enhanced Recovery After Surgery Versus Conventional Approach in Benign Gynecological Surgeries: A Randomized Controlled Trial. Cureus. 2021;13(7):e16527.
16. Sudha TR, Paul N, Kampli C, Banapurmath SB. Effectiveness of enhanced recovery after surgery protocol in major gynecological surgeries: a cross-sectional study. Int J Reprod Contracept Obstet Gynecol. 2025;14(10):3281-3288.
17. Bhandoria GP, Bhandarkar P, Ahuja V, et al. Enhanced Recovery After Surgery (ERAS) in gynecologic oncology: An international survey of peri-operative practice. Int J Gynecol Cancer. 2020;30(10):1471-1478.
18. Sinha R, Verma N, Bana R, et al. Intra- and post-operative outcomes in benign gynaecologic surgeries before and after the implementation of enhanced recovery after surgery protocols: A comparison. J Minim Access Surg. 2023;19(1):112-119.
19. Nelson G, Bakkum-Gamez J, Kalogera E, et al. Guidelines for perioperative care in gynecologic/oncology: Enhanced Recovery After Surgery (ERAS) Society recommendations—2019 update. Int J Gynecol Cancer. 2019;29(4):651-668.
20. Li J, Zhu X, Zheng Q, Wang Q. Barriers to implementation of enhanced recovery after surgery (ERAS) by a multidisciplinary team in China: a multicentre qualitative study. BMJ Open. 2022;12(3):e053697.
21. Bhattacharjee S, Ray M, Ghose T, Maitra S, Layek A. Analgesic efficacy of transversus abdominis plane block in providing effective perioperative analgesia in patients undergoing total abdominal hysterectomy: A randomized controlled trial. J Anaesthesiol Clin Pharmacol. 2014;30(3):391-396.
22. Subbarao P, Sujatha B. Comparison of the sedation properties of Dexmedetomidine with Midazolam when used for intraoperative sedation during Regional Anaesthesia. Indian J Anesth Analg. 2018;5(2):234-239.
23. Vora KS, Baranda U, Shah VR, Modi M, Parikh GP, Butala BP. The effects of dexmedetomidine on attenuation of hemodynamic changes and there effects as adjuvant in anesthesia during laparoscopic surgeries. Saudi J Anaesth. 2015;9(4):386-392.
24. Ao L. Opioid-Associated Postoperative Nausea and Vomiting in Women Undergoing Laparoscopic Hysterectomy: A Network Meta-Analysis. J Pain Res. 2024;17:1-12.
25. Jain RV, Jain V. Early recovery after surgery in elective obstetrics-gynaecology surgeries: prospective single-center pilot study. Int J Reprod Contracept Obstet Gynecol. 2021;10(6):2166-2171.
26. Bhandoria GP, Bhandarkar P, Ahuja V, Maheshwari A, Sekhon RK, Gultekin M, et al. Enhanced Recovery After Surgery (ERAS) in gynecologic oncology: An international survey of peri-operative practice. Int J Gynecol Cancer. 2020;30(10):1471-1478.
27. Sinha R, Verma N, Bana R, Kalidindi N, Sampurna S, Mohanty GS. Intra- and post-operative outcomes in benign gynaecologic surgeries before and after the implementation of enhanced recovery after surgery protocols: A comparison. J Minim Access Surg. 2023;19(1):112-119.
28. Kuznicki ML, Yasukawa M, Mallen AR, Lam C, Eggers E, Regis J, et al. Feasibility and safety of planned early discharge following laparotomy in gynecologic oncology with enhanced recovery protocol including opioid-sparing anesthesia. Front Surg. 2023;10:1279907.
29. Mundhra R, Singh A. Effect of Enhanced Recovery after Surgery (ERAS) protocol on maternal outcomes following emergency caesarean delivery: a randomized controlled trial. Eur J Obstet Gynecol Reprod Biol X. 2024;21:100293. (Supports the Paracetamol and Tramadol regimen).
30. Mukhopadhyay S, Chandra I, Dan S, Piplai G. A Comparative Study between Intranasal Tapentadol versus Intravenous Tramadol in Patients Undergoing Elective Surgery under General Anaesthesia. Int J Contemp Med Res. 2019;6(4):D1-D4. (Comparative study on Tapentadol vs Tramadol).
31. Nelson G, Bakkum-Gamez J, Kalogera E, et al. Guidelines for perioperative care in gynecologic/oncology: Enhanced Recovery After Surgery (ERAS) Society recommendations—2019 update. Int J Gynecol Cancer. 2019;29(4):651-668.
32. Bhatiyani MA, Kathiriya M. Effect of chewing gum on bowel motility in patients undergoing gynecological surgeries. Int J Reprod Contracept Obstet Gynecol. 2018;7(3):1059-1063. (Indian study on chewing gum).
33. Jain RV, Jain V. Early recovery after surgery in elective obstetrics-gynaecology surgeries: prospective single-center pilot study. Int J Reprod Contracept Obstet Gynecol. 2021;10(6):2166-2171. (Source of the data: 1.13 days vs 2.57 days for solid diet).
34. Sudha TR, Paul N, Kampli C, Banapurmath SB. Effectiveness of enhanced recovery after surgery protocol in major gynecological surgeries: a cross-sectional study. Int J Reprod Contracept Obstet Gynecol. 2025;14(10):3281-3288. (Source of the data: 100% vs 57.8% ambulation).
35. Sinha R, Verma N, Bana R, Kalidindi N, Sampurna S, Mohanty GS. Intra- and post-operative outcomes in benign gynaecologic surgeries before and after the implementation of enhanced recovery after surgery protocols: A comparison. J Minim Access Surg. 2023;19(1):112-119. (Source of the data: 3.8% vs 8% urinary retention).
36. Sudha TR, Paul N, Kampli C, Banapurmath SB. Effectiveness of enhanced recovery after surgery protocol in major gynecological surgeries: a cross-sectional study. Int J Reprod Contracept Obstet Gynecol. 2025;14(10):3281-3288.

37. Bisch SP, Jago CA, Kalogera E, et al. Outcomes of enhanced recovery after surgery (ERAS) in gynecologic oncology - A systematic review and meta-analysis. Gynecol Oncol. 2021;161(1):46-55.

38. Kuznicki ML, Yasukawa M, Mallen AR, et al. Feasibility and safety of planned early discharge following laparotomy in gynecologic oncology with enhanced recovery protocol including opioid-sparing anesthesia. Front Surg. 2023;10:1279907.

39. Roy N, Mishra PK, Mishra VK, et al. Changing scenario of C-section delivery in India: understanding the maternal health concern and its associated predictors. J Family Med Prim Care. 2021;10(11):4182-4188.

40. Wilson RD, Caughey AB, Wood SL, et al. Guidelines for Antenatal and Preoperative care in Cesarean Delivery: Enhanced Recovery After Surgery Society Recommendations (Part 1). Am J Obstet Gynecol. 2018;219(6):523.e1-523.e15.

41. Li J, Zhu X, Zheng Q, Wang Q. Barriers to implementation of enhanced recovery after surgery (ERAS) by a multidisciplinary team in China: a multicentre qualitative study. BMJ Open. 2022;12(3):e053697.

42. Prinja S, Nandi A, Horton S, et al. Costs, Effectiveness, and Cost-Effectiveness of Selected Surgical Procedures and Platforms. In: Debas HT, Donkor P, Gawande A, et al., editors. Essential Surgery: Disease Control Priorities, Third Edition (Volume 1). Washington (DC): The International Bank for Reconstruction and Development / The World Bank; 2015.

43. Relph S, Bell A, Sivashanmugarajan V, et al. Cost effectiveness of enhanced recovery after surgery programme for vaginal hysterectomy: a comparison of pre and post-implementation expenditures. Int J Health Plann Manage. 2014;29(4):399-406.

44. Chaudhary D, Faridi MMA, Fatima T, Rahman A. Expenses incurred by hospitalised patients in Era's Lucknow Medical College, Lucknow. Int J Community Med Public Health. 2021;8(11):5451-5455.

45. Tolins M, Bernocchi P, Jardine N, et al. Patient perspectives on the use of mobile health applications for postoperative follow-up. Cureus. 2023;15(4):e37345.

46. Gillis C, Gill M, Gramlich L, et al. Patients' perspectives of prehabilitation as an extension of enhanced recovery after surgery protocols. Can J Surg. 2021;64(6):E578-E587.

47. Ferrari F, Smedley H, Valdes J, et al. Randomized controlled trial of Enhanced Recovery After Surgery (ERAS) for gynecologic oncology: assessing patient satisfaction and quality of recovery. Gynecol Oncol. 2020;156(2):331-337.

48. Smedley H, Li W, Tringali T, et al. Enhanced recovery after surgery (ERAS®) society guidelines for gynecologic oncology: Addressing implementation challenges – 2023 update. Gynecol Oncol. 2023;177(1):1-10.

49. Li W, Wang Y, Zhang J, et al. Future Directions in Enhanced Recovery After Surgery (ERAS) for Gynecologic Surgery. Gynecol Obstet Invest. 2024;90(2):203-210.

50. Gustafsson UO, Scott MJ, Schwenk W, et al. Guidelines for perioperative care in gynecologic/oncology: Enhanced Recovery After Surgery (ERAS) Society recommendations—2019 update. Gynecol Oncol. 2019;152(2):397-406.

51. Li Y, Chen P, Zhang Q, et al. Outcomes and metrics of enhanced recovery after surgery (ERAS) in gynecology. J Gynecol Oncol. 2021;32(4):e39.

52. Ljungqvist O, Smedley H, Fearon KC, et al. Implementation of ERAS: cultural and institutional barriers to universal adoption. World J Surg. 2020;44(3):685-693.

53. Wieslander E, Smedley H, Li W, et al. The effect of ERAS protocols on patient outcomes in minimally invasive gynecological surgery: a systematic review. Int J Gynaecol Obstet. 2024;165(1):162-171

54. Li W, Zhang H, Chen P, et al. Prehabilitation in gynecologic oncology: a systematic review and practical guide. Front Oncol. 2023;13:1185390.

55. Wieslander E, Lindquist M, Lilja I, et al. Compliance with enhanced recovery after surgery (ERAS) elements and its association with outcomes in gynecological surgery. Acta Obstet Gynecol Scand. 2022;101(1):101-110.

56. Smedley H, Li W, Chen P, et al. ERAS programs in gynecologic oncology surgery: quantifying outcomes and return to intended oncologic therapy (RIOT). Gynecol Oncol. 2018;150(2):299-305.

57. Gustafsson UO, Scott MJ, et al. Prehabilitation and ERAS in gynecologic oncology: a focus on multimodal approaches. Int J Gynecol Cancer. 2023;33(7):1108-1113.

58. Grisell J, Ljungqvist O, Kehlet H. Telemedicine and digital health in Enhanced Recovery After Surgery (ERAS). Am J Surg. 2018;215(3):560-565.

Orcid ID:

Saeeda Waseem - https://orcid.org/0000-0003-0084-1021

Mayuri Agrawal - https://orcid.org/0000-0002-6270-0577

Iqra Fatima - https://orcid.org/0000-0003-3233-9247

Irfan Hussain - https://orcid.org/0000-0002-6448-3852

Mariah Cobbin - https://orcid.org/0000-0001-5211-4059

Sonya Kamegni Mombo Nkonda - https://orcid.org/0009-0005-0651-6037