



PERIOPERATIVE ANESTHETIC MANAGEMENT IN ENHANCED RECOVERY AFTER GYNECOLOGIC SURGERY: A NARRATIVE REVIEW

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ABSTRACT

Gynecologic surgery includes procedures ranging from minor ambulatory interventions to complex open operations for advanced malignancy. Anesthetic management has an important influence on postoperative pain, nausea and vomiting, gastrointestinal recovery, mobilization, length of hospitalization, and patient satisfaction. Enhanced Recovery After Surgery pathways integrate evidence-based anesthetic, surgical, nursing, and rehabilitative interventions to reduce the physiological stress of surgery and accelerate functional recovery. Important anesthetic components include preoperative assessment and counseling, avoidance of prolonged fasting, multimodal analgesia, opioid-sparing anesthesia, prevention of postoperative nausea and vomiting, maintenance of normothermia, rational fluid therapy, and early resumption of oral intake and activity. Regional techniques, including neuraxial analgesia and abdominal wall blocks, may provide benefit in selected patients, but their use should be adapted to the surgical approach and expected pain burden. Evidence published between 2014 and 2017 indicates that standardized enhanced recovery pathways can shorten hospital stay and reduce opioid exposure without increasing complications or readmissions after major gynecologic surgery. Successful implementation requires multidisciplinary cooperation, protocol adherence, clinical audit, and individualized management of patients with major comorbidities. This narrative review examines perioperative anesthetic strategies for women undergoing gynecologic surgery using references published from 2014 through 2017.

Key words: anesthesia; gynecologic surgery; enhanced recovery; multimodal analgesia; postoperative nausea and vomiting; perioperative care

Introduction

Gynecologic surgery encompasses hysteroscopy, laparoscopy, hysterectomy, pelvic-floor reconstruction, fertility-preserving procedures, and extensive oncologic operations. The anesthetic requirements of these procedures differ according to surgical approach, duration, patient position, physiological disturbance, and anticipated postoperative pain. [1,2]

Traditional perioperative care frequently involved prolonged fasting, routine bowel preparation, liberal intravenous fluids, extensive opioid administration, delayed oral intake, and extended bed rest. Enhanced Recovery After Surgery protocols replaced many of these practices with coordinated interventions designed to reduce surgical stress and support early recovery [1,2].

The Enhanced Recovery After Surgery Society published specific recommendations for preoperative, intraoperative, and postoperative care in gynecologic oncology surgery in 2016 [1,2]. Although developed primarily for gynecologic oncology, many principles are applicable to major benign gynecologic procedures.

Anesthetic management is central to these pathways. The anesthesiologist influences preoperative optimization, analgesia, hemodynamic stability, fluid therapy, temperature control, postoperative nausea and vomiting, and early functional recovery. The objective is not merely to provide unconsciousness during surgery but to minimize the adverse physiological consequences of both surgery and anesthesia. [1,2]

2. Literature-Review Approach

This narrative review evaluates publications concerning anesthesia and enhanced recovery in gynecologic surgery. References were restricted to literature published from January 2014 through December 2017.

- ☐ Anesthesia for gynecologic surgery
- ☐ Enhanced Recovery After Surgery
- ☐ Gynecologic oncology
- ☐ Multimodal analgesia
- ☐ Opioid-sparing anesthesia
- ☐ Postoperative nausea and vomiting
- ☐ Perioperative fluid management
- ☐ Regional anesthesia
- ☐ Early feeding
- ☐ Postoperative mobilization

Priority was given to professional recommendations, consensus guidance, systematic reviews, cohort studies, and clinical implementation studies. Because of differences in surgical procedures, anesthetic techniques, institutional protocols, and outcome definitions, the evidence is presented as a narrative synthesis.

3. Enhanced Recovery Principles in Gynecologic Surgery

Enhanced recovery is a multidisciplinary model rather than a single anesthetic technique. It combines several modest improvements that collectively reduce physiological stress and support earlier return of function. [1–3]

1. Prepare and educate the patient
2. Correct modifiable medical problems
3. Reduce unnecessary fasting and dehydration
4. Limit the stress response to surgery
5. Maintain physiological stability
6. Provide effective opioid-sparing analgesia
7. Prevent nausea and vomiting
8. Encourage early nutrition and mobilization
9. Avoid tubes, drains, and catheters that are not clinically necessary [1–3]

Implementation of standardized enhanced recovery pathways in major gynecologic surgery has been associated with shorter hospitalization and reduced variation in perioperative care [3–5]. These improvements depend on adherence across the entire pathway rather than isolated use of one intervention.

4. Preoperative Assessment

4.1 Medical evaluation

Preoperative evaluation should identify conditions that may increase anesthetic or surgical risk, including cardiovascular disease, respiratory disease, obesity, diabetes mellitus, renal dysfunction, anemia, malnutrition, venous thromboembolism, obstructive sleep apnea, chronic pain, long-term opioid use, and anticoagulant or antiplatelet therapy. [1,2]

Women undergoing gynecologic oncology surgery may be older and may have cancer-related anemia, ascites, pleural effusion, malnutrition, previous chemotherapy, or extensive thromboembolic risk. [1,2]

The assessment should determine whether additional investigations or medical optimization will alter management. Unnecessary routine testing should be avoided, while abnormalities with clinical relevance should be addressed before elective surgery. [1,2]

4.2 Correction of anemia

Preoperative anemia is associated with reduced physiological reserve and an increased likelihood of perioperative transfusion. Hemoglobin should be assessed before major gynecologic surgery, particularly when substantial blood loss is anticipated [1]. [1,2]

Potential causes include iron deficiency, chronic inflammation, uterine bleeding, nutritional deficiency, renal disease, or bone-marrow suppression. Treatment should be based on the cause and the time available before surgery. [1,2]

Correction of anemia is preferable to relying on postoperative blood transfusion. However, surgery for malignant disease should not be delayed without balancing the potential benefits and oncologic consequences. [1,2]

4.3 Assessment of venous-thromboembolism risk

Gynecologic malignancy, pelvic surgery, immobility, obesity, increasing age, and previous thrombosis increase the risk of venous thromboembolism. A plan for mechanical and pharmacological thromboprophylaxis should be established before surgery [1,2].

The timing of anticoagulant administration must be coordinated with neuraxial anesthesia or analgesia. Epidural or spinal procedures should follow accepted safety intervals for anticoagulant administration and catheter removal. [1,2]

5. Patient Education and Shared Expectations

Preoperative counseling is a fundamental component of enhanced recovery. Patients should receive realistic information regarding the anesthetic plan, expected postoperative pain, methods of pain relief, prevention of nausea and vomiting, early oral intake, urinary-catheter removal, mobilization, respiratory exercises, discharge criteria, and recovery after discharge. [1–3]

Clear expectations may reduce anxiety and encourage active participation in recovery. Written information and consistent communication among the surgeon, anesthesiologist, nursing staff, and physiotherapy team are preferable to conflicting instructions. [1–3]

Patients with chronic opioid use or previous severe postoperative pain require an individualized analgesic plan. Abrupt discontinuation of established opioid therapy may lead to withdrawal and inadequate pain control. [1,2]

6. Preoperative Fasting and Carbohydrate Intake

Prolonged fasting may cause thirst, discomfort, dehydration, insulin resistance, and patient dissatisfaction. Enhanced recovery recommendations support clear liquids until approximately two hours and solid food until approximately six hours before anesthesia in appropriately selected patients [1].

Patients with delayed gastric emptying, bowel obstruction, severe reflux, or other aspiration risks require individualized fasting instructions. [1]

Preoperative carbohydrate drinks may reduce thirst, hunger, and postoperative insulin resistance in selected patients. They should not be used routinely in patients with bowel obstruction, severe gastroparesis, or other contraindications. [1]

Carbohydrate loading does not replace nutritional assessment. Patients with malnutrition or prolonged inadequate intake may require a broader nutritional plan. [1]

7. Premedication

Routine sedative premedication may delay recovery, impair mobilization, and increase respiratory depression, particularly in older patients or those with obstructive sleep apnea. Long-acting sedatives should therefore generally be avoided within enhanced recovery pathways [1]. [1,2]

Anxiolysis should be individualized. Explanation, reassurance, and short-acting medication may be appropriate for selected patients with severe anxiety. [1,2]

Preemptive nonopioid analgesic medication may include acetaminophen and, when not contraindicated, a nonsteroidal anti-inflammatory drug or cyclooxygenase-2 inhibitor [1,2]. These agents form the foundation of multimodal analgesia.

Gabapentinoids were incorporated into some enhanced recovery protocols during the review period. Their potential opioid-sparing benefit must be balanced against sedation, dizziness, visual disturbance, and delayed mobilization, particularly in older or medically fragile patients. [1,2]

8. Choice of Anesthetic Technique

8.1 General anesthesia

General anesthesia remains the most common technique for major laparoscopic, robotic, vaginal, and open gynecologic surgery. It provides airway control, immobility, muscle relaxation, and tolerance of pneumoperitoneum and positioning. [1,2]

The anesthetic plan should promote rapid emergence and minimize residual sedation, respiratory depression, and postoperative nausea. [1,2,6]

Short-acting agents and careful neuromuscular monitoring are preferred. Residual neuromuscular blockade can impair ventilation, airway protection, and recovery-room safety. [1,2]

8.2 Total intravenous anesthesia

Propofol-based total intravenous anesthesia may reduce the risk of postoperative nausea and vomiting compared with volatile-anesthetic maintenance in susceptible patients [6].

It may be particularly useful in women with several risk factors for postoperative nausea and vomiting, including previous nausea, motion sickness, nonsmoking status, expected postoperative opioid use, and laparoscopic surgery. [6]

Total intravenous anesthesia does not remove the need for antiemetic prophylaxis in high-risk patients. [6]

8.3 Neuraxial anesthesia

Spinal or epidural anesthesia may be suitable for selected vaginal, pelvic-floor, and lower abdominal procedures. Neuraxial techniques can reduce systemic opioid requirements and provide effective analgesia. [1,2]

Thoracic epidural analgesia may be considered for extensive open gynecologic oncology surgery. However, possible disadvantages include hypotension, motor block, urinary retention, delayed mobilization, technical failure, and interference with pharmacological thromboprophylaxis [1,2].

The routine use of epidural analgesia for minimally invasive surgery is generally unnecessary because the expected pain burden is lower and the potential adverse effects may delay recovery. [1,2]

9. Physiological Effects of Laparoscopic and Robotic Surgery

Laparoscopic and robotic gynecologic procedures require carbon-dioxide pneumoperitoneum and frequently use steep Trendelenburg positioning. These conditions can produce important cardiorespiratory changes. [1,2]

Pneumoperitoneum may increase systemic vascular resistance, reduce lung compliance, increase airway pressure, promote atelectasis, increase carbon-dioxide absorption, and reduce venous return under some conditions. [1,2]

Steep Trendelenburg positioning may increase venous pressure in the head and neck, worsen facial and airway edema, increase intraocular pressure, and reduce functional residual capacity. [1,2]

Ventilation should be adjusted to maintain adequate oxygenation and carbon-dioxide elimination. Lung-protective ventilation commonly includes appropriate tidal volumes, positive end-expiratory pressure, and recruitment maneuvers when clinically indicated. [1,2]

The face, eyes, pressure points, and upper extremities should be protected carefully. Long robotic procedures require particular attention because access to the patient may be limited after docking. [1,2]

10. Airway Management

Tracheal intubation is generally preferred for lengthy laparoscopic or robotic procedures, severe Trendelenburg positioning, or operations associated with increased aspiration risk. [1,2]

Supraglottic airway devices may be appropriate for selected short procedures in patients with low aspiration risk, but their use should account for pneumoperitoneum, positioning, airway pressure, and surgical duration. [1,2]

Before extubation following prolonged steep Trendelenburg positioning, the anesthesiologist should consider the possibility of airway edema. Clinical assessment may include inspection for facial or tongue swelling and evaluation of the cuff leak when significant edema is suspected. [1,2]

11. Hemodynamic and Fluid Management

Both fluid excess and inadequate fluid administration may delay recovery. Excessive crystalloid administration can contribute to tissue edema, impaired pulmonary function, delayed gastrointestinal recovery, and increased body weight [1]. [1,2]

Restrictive fluid administration should not result in untreated hypovolemia or organ hypoperfusion. The objective is individualized, near-zero fluid balance rather than indiscriminate fluid restriction. [1,2]

Balanced crystalloid solutions are generally preferred for routine replacement. Colloid or blood-component therapy should be guided by the clinical situation, blood loss, laboratory results, and institutional policy. [1,2]

For extensive surgery with major fluid shifts, hemodynamic monitoring may be used to guide treatment. Vasopressors are appropriate for vasodilation-related hypotension after adequate evaluation of intravascular volume. [1,2]

Urine output should be interpreted in context. Temporary oliguria during surgery does not always indicate that large volumes of intravenous fluid are required. [1,2]

12. Temperature Management

Perioperative hypothermia can increase discomfort, shivering, coagulation disturbance, wound complications, and delayed anesthetic recovery. Active warming should begin before or during anesthesia for procedures of sufficient duration [1].

- ☐ Forced-air warming
- ☐ Warming of intravenous fluids when appropriate
- ☐ Limiting unnecessary exposure
- ☐ Increasing operating-room temperature for high-risk patients
- ☐ Continuous or intermittent core-temperature monitoring

Normothermia should be maintained through the recovery period. [1]

13. Multimodal Analgesia

Effective analgesia is essential for coughing, deep breathing, mobilization, sleep, and patient satisfaction. Excessive opioid use may cause nausea, vomiting, sedation, pruritus, urinary retention,

ileus, and respiratory depression. [1,2]

Multimodal analgesia combines medications and techniques with different mechanisms of action to improve pain control while reducing opioid exposure [1,2].

- ☐ Acetaminophen
- ☐ A nonsteroidal anti-inflammatory drug or cyclooxygenase-2 inhibitor
- ☐ Local-anesthetic infiltration
- ☐ Regional analgesia
- ☐ Limited rescue opioids
- ☐ Selected adjunctive medications

Analgesic plans should consider renal function, gastrointestinal risk, cardiovascular disease, bleeding risk, allergy, age, and preexisting pain. [1,2]

13.1 Acetaminophen

Acetaminophen is a core component of multimodal analgesia. It can be administered orally or intravenously and has relatively few contraindications when appropriate dosage limits are observed. [1,2]

Oral administration is generally suitable when gastrointestinal absorption is expected to be reliable.

13.2 Nonsteroidal anti-inflammatory drugs [1,2]

Nonsteroidal anti-inflammatory drugs reduce pain and opioid requirements. Potential concerns include renal injury, gastrointestinal bleeding, platelet dysfunction, and cardiovascular risk.

They should be used cautiously or avoided in patients with significant renal dysfunction, active gastrointestinal bleeding, severe hypovolemia, or relevant drug allergy. [1,2]

13.3 Opioids

Opioids remain appropriate for breakthrough pain but should not be the sole method of analgesia. Short-acting oral opioids are generally preferable once the patient can tolerate oral medication. [1,2] Patient-controlled intravenous analgesia may be useful after extensive surgery when oral intake is not possible. It should be discontinued when no longer necessary.

Patients receiving opioids require monitoring for sedation and respiratory depression, particularly when obesity, sleep apnea, advanced age, renal impairment, or concurrent sedative medication is present. [1,2]

14. Regional Analgesic Techniques

14.1 Epidural analgesia

Epidural analgesia may provide excellent pain relief following extensive open abdominal surgery. Local-anesthetic-based regimens can reduce systemic opioid requirements. [1,2]

Potential disadvantages include hypotension, motor weakness, urinary retention, technical failure, and delayed mobilization. Epidural catheters also complicate the timing of anticoagulant prophylaxis. [1,2]

The benefits are most likely to outweigh the disadvantages in selected patients undergoing large open incisions rather than routine minimally invasive procedures [1,2].

14.2 Intrathecal opioids

A single intrathecal opioid dose may provide prolonged analgesia without the need for an indwelling epidural catheter. It may be considered for open hysterectomy or major oncologic surgery. [1,2]

Potential adverse effects include pruritus, nausea, urinary retention, and delayed respiratory depression. Appropriate postoperative monitoring is required. [1,2]

14.3 Transversus abdominis plane block

A transversus abdominis plane block provides somatic analgesia to the anterior abdominal wall. It may reduce incisional pain following open or laparoscopic gynecologic surgery. [1,2]

The technique does not reliably treat visceral pelvic pain and should be used as part of a multimodal regimen rather than as a complete analgesic technique. [1,2]

Ultrasound guidance improves visualization of tissue planes and local-anesthetic spread. The total local-anesthetic dose must remain within safe limits, particularly when bilateral blocks or additional wound infiltration are performed. [1,2]

14.4 Surgical-site infiltration

Local-anesthetic infiltration of port sites or abdominal incisions is simple and can be incorporated into routine practice. Continuous wound-infusion catheters may be considered after selected open procedures. [1,2]

The relative benefit depends on incision type, local-anesthetic dose, and the other components of the analgesic pathway. [1,2]

15. Prevention of Postoperative Nausea and Vomiting

Women undergoing gynecologic surgery frequently possess several risk factors for postoperative nausea and vomiting. Laparoscopic surgery, volatile anesthetics, and postoperative opioids may further increase risk. [6]

Consensus recommendations support risk assessment and the use of multimodal prophylaxis in patients with moderate or high risk [6].

Risk-reduction strategies include minimizing perioperative opioids, considering propofol-based total intravenous anesthesia, avoiding unnecessary nitrous oxide, maintaining appropriate hydration, using regional and nonopioid analgesia, and administering antiemetics from different pharmacological classes. [6]

Common prophylactic agents include dexamethasone, serotonin-receptor antagonists, droperidol or haloperidol, and anticholinergic medication. [6]

A rescue antiemetic should generally be selected from a different drug class from those already used for prophylaxis. Persistent vomiting should prompt assessment for causes such as ileus, bowel obstruction, medication effects, hypotension, or metabolic disturbance. [6]

16. Neuromuscular Blockade and Reversal

Adequate muscle relaxation may improve operating conditions during laparoscopic and robotic surgery. However, residual neuromuscular blockade increases the risk of airway obstruction, hypoventilation, and postoperative pulmonary complications. [1,2]

Quantitative neuromuscular monitoring should guide additional relaxant administration and reversal. Extubation should occur only after satisfactory recovery of neuromuscular function. [1,2]

Reversal strategy should be based on the depth of blockade and the drug used. Pharmacological reversal does not replace objective monitoring. [1,2]

17. Post-Anesthesia Care

The immediate postoperative priorities include airway protection, adequate ventilation, hemodynamic stability, pain control, prevention and treatment of nausea, temperature control, assessment of bleeding, evaluation of urine output when clinically relevant, and early identification of complications. [1,2,6]

Excessive sedation should not be interpreted simply as normal recovery. Opioid accumulation, residual anesthetic effect, neuromuscular weakness, hypercapnia, hypoglycemia, and neurological complications should be considered when recovery is delayed. [1,2]

Analgesic and antiemetic plans should continue without interruption during transfer from the operating room to the recovery unit and ward. [1,2,6]

18. Early Oral Intake

Enhanced recovery pathways encourage early resumption of oral fluids and food after gynecologic surgery when clinically appropriate [2].

Traditional waiting for bowel sounds or passage of flatus is usually unnecessary after uncomplicated surgery. Early feeding may support recovery but can be limited by nausea, vomiting, ileus, or extensive bowel surgery. [2,7]

Intravenous fluids should be reduced or discontinued once oral intake is adequate. Continued intravenous fluid solely because a cannula is present may contribute to fluid overload and restrict mobility. [2,7]

19. Urinary Catheter and Drain Management

Urinary catheters may restrict mobilization and increase infection risk. They should be removed as early as clinically appropriate [2].

Longer catheterization may be required after radical pelvic surgery, extensive bladder dissection, urinary-tract reconstruction, or significant epidural-related urinary retention. [2]

Routine drains and nasogastric tubes are not recommended after uncomplicated gynecologic surgery unless there is a specific indication [1,2]. Their continued need should be reviewed daily.

20. Early Mobilization

Prolonged bed rest contributes to muscle loss, insulin resistance, pulmonary complications, and venous thromboembolism. Mobilization should begin on the day of surgery or the first postoperative morning when clinically feasible [2]. [2,7]

Effective analgesia, control of nausea, early removal of catheters, and avoidance of excessive intravenous lines facilitate mobility. [2,7]

Mobilization targets should be realistic and documented. Patients who cannot mobilize should be assessed for uncontrolled pain, hypotension, anemia, sedation, neurological impairment, or surgical complications. [2,7]

21. Thromboprophylaxis

Major gynecologic surgery, particularly for malignancy, carries a substantial risk of venous thromboembolism. Mechanical and pharmacological prophylaxis should be selected according to patient and procedural risk [1,2].

Intermittent pneumatic compression should begin before or during surgery in high-risk patients. Pharmacological prophylaxis is usually provided with low-molecular-weight heparin or an alternative approved agent. [1,2]

Extended prophylaxis may be appropriate after major open surgery for malignancy. The decision should consider bleeding risk, mobility, cancer status, and applicable institutional guidance. [1,2]

Coordination with neuraxial procedures is essential to reduce the risk of spinal or epidural hematoma. [1,2]

22. Outcomes of Enhanced Recovery Programs

Implementation studies published during the selected period reported reductions in hospital stay and opioid use after major gynecologic surgery without clear increases in readmission or major complications [3–5,7]. [3–5,7–12]

An enhanced recovery program for women undergoing major gynecologic operations demonstrated that standardized perioperative care could improve recovery-related outcomes [3]. Similar programs in abdominal hysterectomy and gynecologic oncology supported earlier discharge and more consistent perioperative practices [4,5]. [3–5,7–12]

The success of a pathway depends on compliance. Labeling routine care as “enhanced recovery” without changing fasting, analgesia, fluids, mobilization, and postoperative nutrition is unlikely to produce meaningful benefit. [7–10,12]

23. Special Considerations in Gynecologic Oncology

Women undergoing surgery for gynecologic cancer may present with complex physiological problems, including malnutrition, anemia, ascites, pleural effusion, renal impairment, venous

thromboembolism, previous chemotherapy, bowel obstruction, large pelvic or abdominal masses, and extensive planned cytoreductive surgery. [1,2,8–10,12]

Large ovarian masses or ascites may impair ventilation and venous return. Induction of anesthesia and surgical decompression may produce rapid hemodynamic changes. [1,2,8]

Extensive cytoreductive surgery may involve bowel resection, splenectomy, diaphragmatic surgery, major blood loss, and prolonged operating time. Invasive monitoring, blood-product availability, postoperative critical care, and advanced analgesic techniques may be required. [1,2,8]

Enhanced recovery principles should be adapted rather than applied rigidly when severe disease or major complications require different management. [1,2,8–10,12]

24. Special Considerations in Minimally Invasive Surgery

Minimally invasive surgery is generally associated with less incisional pain, reduced blood loss, and faster recovery than open surgery. Analgesic techniques should reflect this lower pain burden. [9,11,12]

Routine epidural analgesia is rarely justified for uncomplicated laparoscopic hysterectomy. Oral nonopioid medication, port-site infiltration, and limited rescue opioids are often sufficient. [1,2,9,11,12]

However, prolonged Trendelenburg positioning, obesity, severe endometriosis, extensive adhesiolysis, and robotic operating time may increase anesthetic complexity despite small incisions. [1,2,9,11,12]

Same-day discharge may be appropriate after selected minimally invasive procedures when pain and nausea are controlled, oral intake is tolerated, mobility is adequate, and appropriate support is available at home. [9,11,12]

25. Barriers to Implementation

Common barriers include inconsistent staff education, conflicting instructions, resistance to changing established practice, inadequate preoperative counseling, lack of standardized medication orders, failure to measure compliance, limited weekend services, delayed catheter removal, excessive reliance on opioids, and lack of multidisciplinary ownership. [8–10,12]

Successful programs require agreed protocols, electronic or written order sets, staff training, patient information, and regular audit. [8–10,12]

The pathway should be reviewed when outcomes are poor. Complications should not automatically be attributed to enhanced recovery without examining individual clinical circumstances and protocol adherence. [8–10,12]

26. Limitations of the Evidence

Studies from 2014–2017 included observational cohorts, before-and-after implementation studies, consensus recommendations, and relatively few large randomized trials. [7–12]

Important limitations included differences in surgical procedures, variation in pathway components, inconsistent definitions of compliance, changes in surgical technique over time, institutional differences, limited reporting of patient-reported outcomes, possible selection bias, and difficulty determining which individual component produced benefit. [7–12]

Enhanced recovery should therefore be viewed as an integrated care model. Evidence for the complete pathway does not necessarily prove the independent benefit of every individual intervention. [7–12]

27. Future Directions

Future research should identify which anesthetic interventions provide the greatest benefit for particular gynecologic procedures and patient populations. [7–12]

Priority areas include procedure-specific analgesic pathways, optimal use of abdominal wall blocks, opioid-free and opioid-minimizing anesthesia, enhanced recovery in frail and older women, recovery after extensive cytoreductive surgery, same-day discharge after minimally invasive procedures, patient-reported recovery measures, long-term opioid use, cost-effectiveness, digital monitoring after

discharge, and strategies to improve pathway compliance. [7–12]

Future studies should report individual enhanced recovery components, protocol adherence, complications, readmissions, patient experience, and functional recovery. [7–12]

28. Conclusion

Anesthetic management is a central component of enhanced recovery after gynecologic surgery. Evidence and recommendations published from 2014 through 2017 support coordinated perioperative care involving patient education, avoidance of prolonged fasting, multimodal analgesia, prevention of postoperative nausea and vomiting, rational fluid management, maintenance of normothermia, early feeding, and early mobilization [1–6].

Opioid-sparing analgesia should be adapted to the surgical approach. Epidural analgesia may be useful after selected extensive open procedures, whereas minimally invasive operations usually require less intensive regional analgesia [1,2].

Women undergoing gynecologic surgery commonly have a high risk of postoperative nausea and vomiting. Risk assessment, reduction of emetogenic anesthetic factors, and multimodal antiemetic prophylaxis are therefore important [6].

Enhanced recovery programs can shorten hospitalization and standardize care without an apparent increase in major complications when implemented appropriately [3–5,7]. However, protocols should not replace clinical judgment. Patients with severe comorbidity, advanced malignancy, bowel obstruction, major blood loss, or extensive surgery require individualized management.

The most effective model is multidisciplinary. Anesthesiologists, gynecologists, nurses, physiotherapists, pharmacists, dietitians, and patients must work within a coordinated pathway that is regularly audited and revised. [1–5,7–10,12]

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