Enhanced Recovery After Surgery (ERAS®) Society Postoperative Care

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ERAS
✓ By using evidence-based practices
✓ Multimodal perioperative care
✓ Supporting the physiologic function
✓ Reduction of stress response to surgery
✓ Acceleration of recovery
✓ Reduction in duration of hospital stay
Members of the Multidisciplinary Team

Surgeons ⭐
- Anesthetists
- Nurses
- Dietitians
- Hospital management
- Physiotherapists
- Occupational therapists
- Pain team
- Theatre staff
- Audit team
ERAS

• Three distinct phases
  - pre operative phases
  - intra operative phases
  - Post operative phases
Post operative phases

- Prophylaxis against thromboembolism
- Postoperative fluid therapy
- Perioperative nutritional care
- Prevention of postoperative ileus
- Postoperative glucose control
- Postoperative analgesia
- Peritoneal drainage
- Urinary drainage
- Early mobilization
- Prevention of postoperative nausea and vomiting
Society position statements/white papers


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HIGHLIGHTS

• We provide evidence supporting postoperative management of patients undergoing gynecologic/oncology surgery.
• This guideline will help integrate knowledge into practice, align perioperative care, and encourage future investigations.

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ABSTRACT

© 2016 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).
### Immediate postoperative prophylaxis

- **Pneumatic compression stockings** reduce the rate of VTE (venous thromboembolism) when compared to observation.
- The risk reduction is equivalent when compared to **heparin** and improved when combined with heparin in gynecologic oncology patients.

*Cochrane Database of Systematic Reviews* Graduated compression stockings for prevention of deep vein thrombosis (Review). 2018

*A protocol of dual prophylaxis for venous thromboembolism prevention in gynecologic cancer patients, Obstet. Gynecol.* 2008
Postoperative Thromboembolism Prophylaxis

Summary and recommendations

- Patients should wear well-fitting compression stockings and have intermittent pneumatic compression
- Extended prophylaxis (28 days) should be given to patients after laparotomy for abdominal or pelvic malignancies

Evidence level

- High

Recommendation grade

- Strong
Postoperative Thromboembolism Prophylaxis

• The role of extended prophylaxis in minimally invasive surgery is likely not necessary without other high risk features (elevated BMI, previous VTE, coagulopathy, decreased mobility)

M.S. Rasmussen, Prolonged thromboprophylaxis with low molecular weight heparin for abdominal or pelvic surgery, Cochrane Database Syst. Rev. 2009
Postoperative Thromboembolism Prophylaxis

- Low molecular weight heparin (e.g. Dalteparin 5000 U SC daily or equivalent) starting POD 1 (regimen continued for 28 days for all patients undergoing laparotomy for cancer)
Intravenous fluids should be terminated within 24 h after surgery; balanced crystalloid solutions are preferred to 0.9% normal saline.

- **Evidence level**: Moderate
- **Recommendation grade**: Strong
Postoperative Fluid Therapy

- Fluids at 40 mL/h postoperatively (typical duration 8–12 h)
- Fluid bolus of 250–500 mL for urine output <20 mL/h
- Peripheral lock IV when patient has 600 mL oral intake
Perioperative Nutritional Care

Summary and recommendations
- A regular diet **within the first 24 h** after gynecologic/oncology surgery is recommended

Evidence level
- **High**

Recommendation grade
- **Strong**
Postoperative Diet

• Solid diet (regular or low fat/fiber) started postoperative day (POD) 0

• Oral Nutritional Supplement (e.g. Ensure Plus, Twocal HN) on POD 0 and continue until discharge
Prevention of Postoperative İleus

Summary and recommendations
- The use of postoperative **laxatives** and **chewing gum** should be considered

Evidence level
- Laxatives: **Low**
- Chewing gum: **Moderate**

Recommendation grade
- Laxatives: **Weak**
- Chewing gum: **Weak**
Prevention of Postoperative İleus

• Multifactorial
• **Postoperative strategy**
  – Thoracic epidural analgesia
  – Avoiding the use of opioids (NSAİD, Cox2 inh.)
  – Avoid prophylactic nasogastric tube
  – Early mobilization
  – Chewing gum (Chewing gum orally for 30min after meals three times per day as tolerated starting on POD 0)
  – Use of laxatives
Impact of enhanced recovery after surgery (ERAS) protocol on gastrointestinal function in gynecologic oncology patients undergoing laparotomy☆

Teresa K.L. Boitano a, Haller J. Smith b,*, Tullia Rushton a, Mary C. Johnston c, Prentiss Lawson d, Charles A. Leath III b, Anisa Xhaja e, Meredith P. Guthrie e, J. Michael Straughn Jr. b

n:197 in the control group and 179 in the ERAS group

CONCLUSIONS:
Implementation of an ERAS protocol significantly decreases the risk of postoperative ileus in gynecologic oncology patients undergoing laparotomy. ERAS also reduced length of stay compared to pre-ERAS controls.
Postoperative Glucose Control

- Perioperative hyperglycemia;
  - Perioperative mortality
  - Hospital length of stay
  - Intensive care unit length of stay
  - Postoperative infection

Postoperative Glucose Control

Summary and recommendations

- ERAS elements that reduce metabolic stress should be employed to reduce insulin resistance and the development of hyperglycemia
- Perioperative maintenance of blood glucose levels: \(<180-200\, \text{mg/dL}\)
- Glucose levels above this range should be treated with insulin infusions and regular blood glucose monitoring to avoid the risk of hypoglycemia

Evidence level

- Use of stress reducing elements: High
  - Treating hyperglycemia above 180–200 mg/dL: High

Recommendation grade

- Use of stress reducing elements: Strong
  - Treating hyperglycemia above 180–200 mg/dL: Strong
Postoperative Analgesia

• Uncontrolled acute post-operative pain is associated with;
  - Dissatisfaction
  - Prolong time to mobilization
  - Postoperative complications
  - Length of hospital stay
  - Development of chronic pain
Postoperative Multimodal Analgesia

- Multimodal analgesia is **not new**
- The aim is to reduce the postoperative opioid requirement
  - Opioids
  - Combination of **NSAID** and acetaminophen
  - Gabapentin
  - Dexamethasone
Postoperative Multimodal Analgesia

For patients unable to tolerate diet following surgery, then an opioid IV PCA can be used until resumption of GI function, but the oral route should be used as soon as possible.

*Acetaminophen* and NSAIDs in combination should be administered regularly to all patients.

*Gabapentin* may reduce pain and side effects and may be considered, although the optimal dose is not known.

*Dexamethasone* may be administered to prevent PONV and reduce pain.
Postoperative Multimodal Analgesia

Evidence level:
- Use of multimodal analgesia: **High**
- Combination of acetaminophen and NSAIDs: **High**
- Gabapentin: **Moderate**
- Dexamethasone as an analgesic: **Low**

Recommendation grade:
- **Strong**
Analgesia for Vaginal Hysterectomy

Summary and recommendations
- Local anesthetic infiltration may be effective at reducing early postoperative pain and opioid consumption, and facilitating early mobilization.
- Either paracervical nerve block or intrathecal morphine may reduce pain and opioid consumption after vaginal hysterectomy. However, the effect is small.

Evidence level
- Low

Recommendation grade
- Weak
Analgesia for Open General Gynecologic Surgery

Summary and recommendations

- **TEA** or **spinal anesthesia with intrathecal morphine** may improve recovery parameters and are recommended.
- Where patients have undergone general anesthesia without neuraxial blockade, a truncal block, such as **TAP blocks**, may reduce pain and opioid consumption for up to 24 h and should be employed.
- **Continuous wound infiltration** or intraperitoneal instillation of local anesthetic may improve recovery for colorectal surgery and may be considered as an alternative to TAP blocks or TEA, however the evidence of benefit in gynecologic surgery is lacking.
- Systemic opioids may be given either orally or by **intravenous PCA**.
Analgesia for Open General Gynecologic Surgery

Evidence level
- Intrathecal morphine: Moderate
- Thoracic epidural analgesia: High
- TAP blocks: Moderate
- Continuous Wound Infiltration (CWI): Moderate

Recommendation grade
- Strong
**Analgesia for Major Oncologic Surgery**

**Summary and recommendations**

- **TEA** is effective in reducing post-operative pain after gynecologic laparotomy. However, TEA may not improve other post-operative outcomes and patients may require additional IV opioids in addition to TEA to achieve adequate analgesia. TEA may compound hypotension that requires vasopressor support.

- **Intravenous PCA** appears to be a suitable alternative.

**Evidence level**

- Low

**Recommendation grade**

- Weak
Analgesia for Laparoscopic Gynecologic/Oncology Surgery

• For laparoscopic gynecologic/oncology surgery, neither TAP blocks nor intraperitoneal instillation of local anesthetic are recommended on the current level of evidence. For laparoscopic abdominal surgery, TEA may prolong hospital stay without improving outcomes.

• Multimodal analgesia should be employed, and post-operative opioids may be given either orally or by IV PCA depending on magnitude of surgery and predicted post-operative gut function.

Summary and recommendations

Evidence level
• Low

Recommendation grade
• Weak
Peritoneal Drainage

Summary and recommendations

- Peritoneal drainage is not recommended routinely in gynecologic/oncology surgery including for patients undergoing lymphadenectomy or bowel surgery

Evidence level

- Moderate

Recommendation grade

- Strong
Urinary Drainage

Summary and recommendations

- Urinary catheters should be used for postoperative bladder drainage for a short period preferably <24 h postoperatively

Evidence level

- Low

Recommendation grade

- Strong
Early Mobilization

- There are multiple hypothesized benefits to early mobilization;
- Pulmonary complications
- Insulin resistance
- Muscle atrophy
- Venous thromboembolic complications
- Length of hospital stay

M. Van der Leeden, et al., Early enforced mobilisation following surgery for gastrointestinal cancer: feasibility and outcomes, Physiotherapy 2015
Early Mobilization

Summary and recommendations
• Patients should be encouraged to mobilize within 24 h of surgery

Evidence level
• Low

Recommendation grade
• Strong
Prevention Of Postoperative Nausea And Vomitting

- Prolong time to oral intake of fluids and foods
- Prolong time to mobilization

Recommendation: **Multimodal approach**

• Seratonin antagonists
• Dopamine antagonists
• Dexamethasone
• Anticholinergics
• Antihistamine agents
<table>
<thead>
<tr>
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<td>A multimodal approach to analgesia should be adopted including use of NSAIDS/acetaminophen, gabapentin and dexamethasone (unless contraindications exist).</td>
<td>Multimodal; high NSAIDS/acet: high Gabapentin: moderate Dexamethasone: low</td>
<td>Strong</td>
</tr>
</tbody>
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**Vaginal hysterectomy**
- Paracervical nerve block or intrathecal morphine can be used to reduce pain and opioid consumption.

**Open general gynecologic surgery**
- Spinal anesthesia with intrathecal morphine is recommended. Alternatively, thoracic epidural analgesia (TEA) with low concentration local anesthetic solutions with the addition of opiates for 24-48 h can be considered.
- Truncal nerve blocks (TAP or ilioinguinal) can be recommended where patients have undergone general anesthesia without neuraxial blockade.
- Continuous wound infiltration (CWI) of local anesthetic can be considered.

**Major oncologic surgery**
- TEA may be considered but patients frequently require additional IV opioids in addition to TEA to achieve adequate analgesia.

**Laparoscopic gynecologic/oncology surgery**
- Lack of evidence makes it difficult to recommend one analgesic intervention over another, however a multimodal approach should be employed.

**Peritoneal drainage**
- Peritoneal drainage is not recommended routinely in gynecologic/oncology surgery including for patients undergoing lymphadenectomy or bowel surgery.

**Urinary drainage**
- Urinary catheters should be used for postoperative bladder drainage for a short period preferably <24 h postop.

**Early mobilization**
- Patients should be encouraged to mobilize within 24 h of surgery.
THANK YOU