



Guidelines for perioperative care in
gynecologic/oncology: Enhanced
Recovery After Surgery (ERAS)
Society recommendations—2019
update

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ERAS

:Enhanced Recovery After Surgery (ERAS)
a global surgical **quality improvement**

- **clinical improvements**¹
- **cost benefits** to the healthcare system



Recommendations

- Recommendations are based on quality of evidence (**high, moderate, low**)
- but also on the balance between **desirable and undesirable effects**,
- and on **values and preferences** of practitioners. Thus, strong recommendations may be reached from low-quality data and vice versa.



Pre-operative Bowel Preparation

- Pre-operative bowel preparation has **traditionally** been used under the assumption that the reduction in the stool burden may decrease post-operative infectious morbidity including **anastomotic leak**.

patient dissatisfaction,

adverse outcomes :

- **pre-operative dehydration**
- **electrolyte abnormalities**

that can hinder post-operative recovery.



Pre-operative Bowel Preparation

Data from **randomized controlled trials** on the use of bowel preparation in gynecologic surgery are limited to patients undergoing **minimally invasive** gynecologic surgery.

its use **is not associated** with

- improved intraoperative visualization,
- ease of bowel handling
- or procedure performance.



mechanical bowel preparation

lack of data for gynecologic surgery, data are extrapolated from the **colorectal** literature. Four **meta-analyses** showed that the use of *mechanical bowel preparation* **was not** associated with a

- decrease in **overall mortality**
- **surgical site infection rate**
- **anastomotic leak rate**
- **reoperation**

.compared with **no mechanical bowel preparation**



oral antibiotics

- **retrospective studies** have shown that:

oral antibiotics alone compared with no bowel preparation

significantly reduced post-operative infectious morbidity including anastomotic leaks as well as major morbidity.



oral antibiotics

- The combination of oral antibiotics with mechanical bowel preparation **did not offer any additional benefit** in reducing post-operative infectious morbidity compared with oral antibiotics alone.
- These data suggest that oral antibiotics may have value as pre-operative bowel preparation and bring into question the significance of adding mechanical bowel preparation in this setting.



pre-operative bowel preparations

- well-established ERAS pathways in gynecologic surgery **without pre-operative bowel preparations** (including cases with scheduled bowel resection) have been **proven safe** with very low rates of anastomotic leak



patient education, 4% chlorhexidine gluconate shower before surgery, antibiotic administration, 2% chlorhexidine gluconate and 70% isopropyl alcohol coverage of incisional area, and cefazolin redosing 3–4 hours after incision. New elements initiated were: sterile closing tr and staff glove change for fascia and skin closure, dressing removal at 24–48 hours, dismissal with 4%

chlorhexidine gluconate, and follow-up nursing
Using Bundled Interventions to Reduce Surgical Site Infection After Major Gynecologic Cancer Surgery

phone call. ay



pre-operative bowel preparations

- ERAS pathways of surgical site infection reduction bundles which **forgo** bowel preparation have resulted in a significant decrease in the surgical site infection rate **as low as 2.4%** among ovarian cancer patients , the highest risk group for post-operative infectious morbidity.
- Notably, this *compares favorably* to surgical site infection bundles which incorporate combined oral antibiotics with mechanical bowel preparation, in which infection rates decreased **to 7%** in a comparable high-risk ovarian cancer population.



:Summary and Recommendation

Routine pre-operative bowel preparation should not be used before minimally invasive gynecologic surgery. Its use is similarly discouraged **before open** laparotomy in gynecologic surgery/gynecologic oncology, especially within an established ERAS pathway. Surgeons who feel bowel preparation is necessary should limit its use to patients in which a colon resection is planned. In these cases the use of oral antibiotics alone should be considered or combined with mechanical bowel preparation. High quality data from the colorectal literature have shown that **mechanical bowel preparation alone does not decrease post-operative morbidity and should thus be abandoned.**

- Evidence level: moderate
- Recommendation grade: **strong**



Pre-operative Fasting and Carbohydrate Treatment

- **Surgical stress** following major surgery induces a marked and well-defined post-operative **metabolic response**. The use of pre-operative oral carbohydrates and avoiding pre-operative fasting attenuate these post-operative responses.
- Several randomized controlled trials have reported that **clear fluids** can be safely given up to **2 hours**, and a **light meal up to 6 hours**, before elective procedures requiring general anesthesia, in children and adults.
- most investigations used a pre-operative beverage(**tea,coffee..**) containing 50 g carbohydrate
- high osmolality or fat may **slow** gastric emptying



Oral carbohydrates

- Oral carbohydrates in randomized controlled trials have been shown to
 - improve pre-operative **well-being**,
 - reduce post-operative **insulin resistance**,
 - decrease **protein breakdown**,
 - better maintain **lean body mass** and muscle strength
 - provide beneficial **cardiac effects**



Oral carbohydrates

In one randomized placebo-controlled trial,

- less post-operative nausea and vomiting,
- metoclopramide consumption,
- improved patient satisfaction

was noted 24 hours after abdominal myomectomy.

Ajuzieogu OV , . Effect of preoperative fasting on residual ..in patients myomectomy. Niger J Clin Pract 2016;



Oral carbohydrates

A Cochrane review of abdominal surgery, studies reported that **preoperative carbohydrate treatment** was associated with

- **reduced post-operative insulin resistance,**
- **enhanced return of bowel function,**
- **and shorter hospital stay** with no effect on **post-operative complication rates.**

*Preoperative carbohydrate treatment for enhancing recovery after elective surgery.
Cochrane Database Syst Rev 2014*



Oral fluids

- Oral fluids including oral carbohydrates may not be administered safely in patients with documented **delayed gastric emptying** or **gastrointestinal motility disorders** as well as in patients undergoing **emergency surgery**.
- Although **obese** and **diabetic** patients have been included in recent studies of oral carbohydrates and no issues with regard to safety have been reported,

Studies are insufficient to allow a general recommendation



:Summary and Recommendation

- Patients should be encouraged to eat a light meal up until 6 hours,
- consume clear fluids including oral carbohydrate drinks up until 2 hours, before initiation of anesthesia.
- Patients with delayed gastric emptying should fast overnight or **8 hours** before surgery. Oral carbohydrates reduce insulin resistance and improve well-being and should be used routinely (extrapolated from non-gynecological surgery data). There are **insufficient data to make recommendations in diabetic** patients.



Quality of Evidence:

- 6–8 hour fasting for solids and 2 hours for clear fluids including oral carbohydrate drinks (in patients without delayed gastric emptying): **high**
- Oral carbohydrate drinks improving insulin resistance and well-being: **moderate**



:Recommendation Grade

- Avoiding overnight fasting: strong
- Administration of pre-operative oral carbohydrates: strong
- Administration of pre-operative oral carbohydrates in well controlled diabetic patients: weak



Perioperative Nutrition

- Several randomized studies on early feeding have been performed in gynecologic oncology and ovarian cancer.
- Maintenance of appropriate nutritional status post-operatively has led to improvements in return of bowel activity, reduced length of hospital stay, and equivalent complication rates as measured by wound healing, anastomotic leaks, or pulmonary complications.
- In colorectal patients, delivery of post-operative nutrition on day 1 is an independent prognostic factor of 5-year survival and mortality



Perioperative Nutrition

- Perioperative nutritional supplementation, or immune nutrition, is another field of research, examining the roles of polyunsaturated fatty acids, arginine, glutamine, antioxidants, and nucleotides on the effects of inflammation and post-operative healing.
- Arginine supplemented diets, which may improve vasodilation and tissue oxygenation, have been examined in a large systematic review, and showed a reduction in overall infection (RR 0.59) and length of hospital stay with no difference in mortality compared with a heterogeneous control group of nutrition regimens.
- Although most of the included trials were from gastric/colon surgery, one study in gynecologic oncology supported these results.



Perioperative Nutrition

- Several large randomized trials in colorectal patients compared an immune nutrition/high protein diet to a high calorie supplement and found a lower rate of infection and length of stay in the immune nutrition group.
- Higher post-operative protein intake is also associated with earlier discharge.
- Currently there are no definitive guidelines for surgical patients as it pertains to protein needs; however, in the acute care setting guidelines have recommended up to 2.0 g of protein/kg/day and 25–30 kcal/kg/day.
- It appears that a high protein diet post-operatively may reduce complications and the role of immune nutrition and arginine supplementation continues to evolve.



:Summary and Recommendation

- **A regular diet within the first 24 hours after gynecologic/oncology surgery is recommended.** High protein diets may be considered in post-operative management of surgical patients.

Evidence level:

- Feeding within first 24 hours: **high**
- High protein diet: moderate
- Recommendation grade: **strong**



Prevention of Post-operative Ileus

- Return of bowel function is often the last milestone met before post-operative hospital discharge after laparotomy.
- Rates of post-operative ileus as high as 30% have been reported among women undergoing open gynecologic cancer surgery,
- Factors that influence the return of bowel function include, but are not limited to:
 - exposure to opioids
 - fluid balance
 - extent of peritoneal disease
 - complexity of surgery
 - receipt of transfusion
 - post-operative abdomino-pelvic complications.



- Several interventions have been shown to decrease the risk of post-operative ileus either through direct or indirect effects.
- The implementation of minimally invasive surgery reduces the rate of post-operative ileus¹⁴⁷; however, not all patients are candidates for minimally invasive surgery.
- Among patients requiring laparotomy, interventions that stimulate the enteric nervous system and reduce opioid use have been shown to enhance bowel recovery time and reduce the rate of post-operative ileus.
- Simple interventions of early feeding, coffee consumption, and gum chewing have been shown to be effective in decreasing the time to bowel function return.



Prevention of Post-operative Ileus

- ERAS programs that include early feeding, as well as euvolemia, early ambulation, and multimodal analgesia, have been shown to decrease the rate of post-operative ileus by two- to five-fold with current rates ranging from 3–10% in studies of women undergoing high complexity open gynecologic cancer surgery.
- Post-operative coffee consumption has been shown to reduce the rate of post-operative ileus in women undergoing gynecologic cancer surgery from 30% to 10%.
- While the use of chewing gum is safe and inexpensive, a large well-conducted randomized trial recently showed no benefit.



Prevention of Post-operative Ileus

- Blocking or reducing the effect of opioids on the gastrointestinal tract has also been shown to reduce the time to bowel recovery and reduce the rate of post-operative ileus.
- Alvimopan is an oral selective μ -antagonist with very low bioavailability that works directly within the gastrointestinal tract to block the negative effects of opioids on gut motility.
- Randomized controlled trials in colorectal surgery, bladder resection and reconstruction, and ovarian cancer surgery have all demonstrated a reduction in time to bowel recovery and post-operative ileus in the setting of alvimopan 0%



Prevention of Post-operative Ileus

- Alvimopan has been approved by the US Food and Drug Administration (FDA) for perioperative, in-hospital use for patients undergoing planned bowel resection and the first dose is given pre-operatively, before opioid exposure.
- Reduction in opioid consumption through implementation of ERAS pathways that leverage multimodal analgesia and/or liposomal bupivacaine have also led to reduced post-operative ileus rates.
- In fact, the utilization of liposomal bupivacaine instead of bupivacaine-HCl as a single intervention change in an established ERAS protocol reduced total opioid consumption and also reduced post-operative ileus by 50%



:Summary and Recommendation

- **Drinking coffee, as well as various other elements of ERAS pathways including euvoemia, opioid-sparing analgesia, and early feeding are safe, inexpensive, and appear effective in decreasing the time to return of bowel function.**
- **Alvimopan is FDA-approved to reduce the time to bowel function return and post-operative ileus-associated morbidity in patients undergoing planned bowel resection. Liposomal bupivacaine may reduce opioid consumption and the rate of post-operative ileus.**
- **Evidence level: high**
- **Recommendation grade: strong**

