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Enhanced recovery after surgery (ERAS), a multidisciplinary care pathway composed of evidence-based interventions, has challenged the traditional perioperative care paradigm with a goal of enhancing recovery and improving perioperative outcomes ¹.

Enhanced recovery” or “fast track” surgical principles were first described in 1990s by European anesthesiologists and surgeons most notably Dutch professor, Henrik Kehlet ^{1,8}. They introduced the concept (1) limit the degree of the surgical injury itself and (2) find ways to help the body cope by decreasing its stress response to injury. The response to surgical stress is mediated by neurohormonal pathways and complement pathways leading to increased catabolism, immunosuppression, relative hypoxia, insulin resistance, and generalized organ dysfunction that can delay the body’s ability to recover.

The first pathway was developed in Europe for colorectal surgery and has since been adapted for other surgical specialties, including gynecology ^{3,4}. The most studied population in gynecology are oncology patients undergoing laparotomies with hospitalizations longer than 2 days ⁵. After ERAS implementation these patients experienced decreased length of admission, hastened return of bowel function, and decreased narcotic use, resulting in better postoperative pain control, and high patient satisfaction ^{1,6,7}.

Central to ERAS are the core components of patient education, preoperative optimization, avoidance of preoperative fasting, carbohydrate loading, intraoperative euvolemia, standardized opioid-sparing anesthesia, prevention of postoperative pain and nausea, and early mobilization ¹⁻². “Fast-track” protocol, aims to minimize the physiologic stress of surgery and optimize the rehabilitation of patients. This is a multidisciplinary team effort and requires active patient participation in the process.

ERP has been rigorously studied in many surgical specialties. Data showing benefit of ERP principles and protocols is most robust in colorectal surgery, but it has also been implemented with similar positive outcomes in a variety of other surgical specialties including vascular surgery, thoracic surgery, cardiac surgery, urology, hepatobiliary surgery, orthopedics, as well as in gynecologic oncology. However, there is limited data in obstetrics and benign gynecology.

ERAS components 1- ERP protocol for gynecology and gynecologic oncology patients.

Preoperative optimization

- ☑ Assessment preoperative office visit or phone call
- ☑ Screen for chronic conditions and assess optimization for surgery
- ☑ Screen for tobacco and alcohol abuse- cessation 4-6 weeks prior to surgery
- ☑ Assess for weight loss and malnutrition
- ☑ Assess postoperative nausea and vomiting risk using simplified Apfel criteria
- ☑ Perioperative expectations, reinforcing the patient’s role in their own recovery
- ☑ Provide ERAS brochure and nutrition patient information
- ☑ Exercise 30 minutes of walking daily until surgery
- ☑ Diet Protein and carbohydrate-rich foods 1 week prior to surgery
- ☑ Regular diet until midnight the night before surgery
- ☑ Clear liquids until 3 hours prior to surgery (water, black coffee, clear tea, carbonated beverages, fruit juice without pulp, Gatorade)
- ☑ Patients with diabetes should avoid sugar-containing liquids
- ☑ Verification Preoperative phone call the day prior to surgery
- ☑ Nothing by mouth instructions reviewed

☒ Medications reviewed
☒ Shower with soap the night before surgery
 Day of surgery- Preoperative –
☒ Multimodal pain management:
 Celecoxib 400 mg PO (200 mg if age >65 y); omit if GFR <60
 Acetaminophen 1000 mg PO (omit if hepatic dysfunction)
 Morphine sulfate ER 30 mg PO (15 mg if age >65 y)
☒ Postoperative nausea and vomiting prevention:
 Perphenazine 8 mg PO
 Anesthesia can add scopolamine patch if age <65 y
☒ Antibiotic prophylaxis - Cefotetan 2 g IV within 60 minutes of incision
☒ No routine fluid administration
☒ No IV opioid premedication
 Intraoperative Induction:
☒ Propofol (1-2 mg/kg or titrate to amnesia and anesthesia)
☒ Ketamine 20 mg
☒ Lidocaine 100-200 mg bolus
☒ Muscle relaxant (no opioids)
☒ For spinal block-Bupivacaine + hydromorphone (40-100mcgm)
☒ Dexamethasone 4-5 mg IV (avoid if diabetes)
 Maintenance:
☒ Ketamine 10 mg q 1 hour (avoid in final hour)
☒ Lidocaine boluses q 1 hour (1 mg/kg)
☒ Avoid opioids intraoperatively unless patient c/o pain at emergence
☒ Avoid routine use of NGT
☒ Fluid management: Goal is euolemia: 2 mL/kg per hour, Boluses for MAP <60 mm Hg or 20% of baseline
 Emergence:
☒ Propofol titration
☒ Ondansetron 4 mg IV
☒ No IV ketorolac (unless celecoxib not given preoperatively)
☒ No IV acetaminophen (unless not given preoperatively)
☒ Postoperative Transition from IV to PO opioids for rescue pain management
☒ Avoid patient controlled anesthesia
☒ Ketorolac and acetaminophen scheduled
☒ Start ice chips/sips of clear liquids as tolerated
☒ IV fluids at 40 mL/h until tolerating oral fluids
☒ Discharge checklist Tolerating oral fluids without nausea and emesis
☒ Pain controlled (pain score <5)
☒ Voiding trial complete
☒ Independent ambulation
☒ No signs of delirium (oriented to person, place, time, current events)
☒ Postoperative follow-up
☒ Assessment POD 1 Phone call from office nurses
☒ Home health if required (urinary retention, DVT prophylaxis)
 Benefits of ERP-
 Meta-analyses & RCTs of ERP pathways have shown benefit.1, 3-6, and 8.

- Improved routine postoperative care
- Reduction in length of stay, with no difference in readmissions.
- Significant reduction in postoperative morbidity and mortality
- Improvement or no change in rates of postoperative complication and readmission.
- A recent meta-analysis across variety of surgical subspecialties confirmed that ERPs are cost-effective.
- Data on patient satisfaction and quality of life are more limited, but the available information suggests a benefit to ERP.
- ERP is consistently associated with improvements in pain scores.
- Rapid return to baseline functional status.
- Improved symptom scores
- Decreased rates of fatigue
- Study of gynecologic patients found improvements in “autonomy”, “physical complaints” and “postoperative pain”

 Conclusion-
 Implementation of an ERP is difficult, not only due to the high degree of coordination that is required, but because many of these interventions run counter to the current practice patterns. Practice patterns can be ingrained and difficult to change. As such, auditing and monitoring ERP implementation is crucial to achieving success. Incidences of protocol deviation must be examined. Parameters audited should include protocol compliance and deviation, measuring clinical outcomes of ERP, and measuring the patient’s quality of life and

satisfaction.

Future of ERP -

In a health care world that is increasingly focused on evidence-based medicine, resource use, and measuring the quality of delivered care, ERP seems a natural fit across the surgical specialties. The cost to implement an ERP are few whereas the benefits are tangible. As we move towards quality metrics, bundled payments, benchmarks, and pay for performance models, ERP is the future. The NHS Britain has embraced ERP as a quality improvement and service tool and considers it standard of care following surgery.

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