Background of Enhanced Recovery after Cesarean (ERAC)

An ERAC protocol aims to standardize the perioperative care of the pregnant patient. By reducing variabilities in care and creating a specific evidence-based care pathway, maternal and fetal outcomes can be improved\(^1\text{-}\text{4}\). In this document, we present the core values and elements that a cesarean delivery-specific enhanced recovery after surgery program should include and present outcome metrics that will allow one to measure the success of the program. Many elements have been adapted from other successful enhanced recovery after surgery (ERAS) programs, predominantly enhanced recovery after colorectal surgery. The level of evidence is provided for each element, based on American College of Cardiology (ACC) and American Heart Association (AHA) Grading Criteria (Appendix), and is subject to change as further evidence is published.

Inherent to any enhanced recovery program is the interdisciplinary approach and the inclusion of all parties involved in the care of patients including anesthesiology, obstetricians, perinatologists, pediatricians, neonatologists, nursing, lactation specialists, pharmacy, hospital administration, the patient and patients’ support systems. Implementing change is always challenging and buy-in from stakeholders varies, but individual practices should still be evidence-based in your subspecialty. Importantly, successful implementation of ERAC may not necessarily lead to a reduction in length of stay for mother and/or newborn or be a cost reduction intervention, rather the mission of ERAC is to improve the global quality of care and optimize quality of recovery after cesarean delivery.

Goal of Enhanced Recovery after Cesarean (ERAC)

The goal of ERAC is to help provide all women with evidence-based, patient-centered care using a standardized, multidisciplinary approach that optimizes recovery from cesarean delivery and improves maternal and newborn outcomes. Central to this goal is a culture of critically examining and applying current knowledge through continual process improvements and collaborations.
Care Pathway
ERAC should be considered a continuum of care from preconception outreach, antepartum optimization, intrapartum care including the anesthetic, and concluding with postpartum inpatient care and outpatient support. In this guideline, we will focus on elements of the care pathway for the preoperative, intraoperative and postoperative periods, presented in table format below. Some elements may not be implemented at your clinical site, while others are likely already part of your patient workflow and care models. Success of the ERAC program lies in interdisciplinary collaborations.

The committee has identified a few core elements that are required for a program to be called ERAC. These core elements are identified by **bolded text with asterisks** within each table. ERAC pathways have been developed for scheduled cesarean delivery. However, many elements of the pathway can be applied to non-scheduled cesarean delivery. Examples of various ERAC-related documents, including patient education materials, can be found in the Appendix to help with successful implementation.

Class of Recommendations and Level of Evidence
A review of the literature was conducted for each recommendation. Existing evidence was evaluated for each of the core elements as they relate to enhanced maternal and neonatal recovery after cesarean delivery. The 2016 American College of Cardiology (ACC) and American Heart Association (ACC/AHA) Clinical Practice Guideline Recommendation Classification System have been applied to each of the Core Elements, based on the best available evidence. The classification system is available in the Appendix.
Preoperative ERAC Elements

Table 1 lists both core and recommended preoperative elements for ERAC. The aim of these preoperative elements is to reduce fasting periods, engage patients and providers in the care plan, and promote physical health optimization.

**Table 1: Pre-Operative Elements**

<table>
<thead>
<tr>
<th>ERAC Recommendation</th>
<th>Action</th>
<th>Comments</th>
<th>Level of Evidence</th>
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</table>
| **Limit fasting interval****                   | • Solids up to 6-8 hrs. prior to cesarean delivery                     | Reduces aspiration risk while limiting thirst and starvation. ASA guidelines state 6-8 hrs based on the type of food ingested:  
  • A light meal (e.g. toast and a clear liquid) or milk may be ingested for up to 6 hrs before elective procedures requiring general anesthesia, regional anesthesia, or procedural sedation and analgesia.  
  • Additional fasting time (8 or more hrs) may be needed in cases of patient intake of fried foods, fatty foods or meat. Both the amount and type of foods ingested must be considered when determining an appropriate fasting period. | Class IIb, Level C-EO  
  Low, data extrapolated from colorectal ERAS programs |
| **Non-particulate liquid carbohydrate loading**** | • Non-particulate carbohydrate drink up to 2 hrs prior to cesarean delivery (non-diabetic women only)  
  • 45 grams carbohydrate is recommended  
  • **Examples:**  
    Gatorade 945 ml (54 g carbohydrate)  
    Apple juice 475 ml (56 g carbohydrate), no pulp | • Reduces maternal hypoglycemia and metabolic stress  
  • The benefit of complex carbohydrate (e.g. maltodextrin) drinks for cesarean delivery is currently undefined, and fetal effects unknown  
  • Can omit if mother is diabetic; follow institutional protocols for maternal diabetes/neonatal monitoring | Class IIb, Level C-EO  
  Low, specifically in respect to quantity and quality of evidence; most data are extrapolated from colorectal ERAS programs. More data in cesarean population is needed specifically with respect to ideal type of carbohydrate, dose and fetal-neonatal effects |
| **Patient education****                        | • Minimum: Handout or other standardized educational tool or interaction that | • The goal of ERAC patient education is to set expectations, and to | Class IIb, Level C-NR |
| Lactation/Breastfeeding preparation and support | Minimum: Handout or other standardized tool or interaction that includes information on normal breastfeeding physiology, management of common lactation complications, and resources for breastfeeding support after discharge.  
Ideal: Structured prenatal classes with books, videos, and in-person lactation support in the hospital. Support of the “golden hour” to help women initiate breastfeeding within one hour of birth; referrals to breastfeeding support groups and/or lactation consultant after discharge. | Early breastfeeding improves newborn and maternal outcomes, including promoting emotional attachment, reducing infant infectious complications, and decreasing risk for sudden infant death syndrome.  
Breastfeeding is a public health priority because it is risk protective for downstream adverse health outcomes such as breast cancer and hypertension.  
Every woman should be supported in her informed decision on infant feeding. | Class IIa, Level B-R |
|---|---|---|---|
| Hemoglobin optimization | All pregnant women should be screened for anemia per ACOG guidelines. Women with iron deficiency anemia should be treated with supplemental PO (or if refractory anemia with IV) iron in addition to prenatal vitamins.  
Anemia other than iron deficiency should be further evaluated. | Goal: Work with obstetric provider team during prenatal visits to engage patient in understanding the importance of hemoglobin optimization; treat prenatal anemia appropriately.  
Antepartum anemia is a significant predictor of postpartum anemia, which is linked to depression, cognitive impairment and fatigue. | Class IIa, Level B-R |
| **• Iron deficiency anemia in pregnancy is linked to increased risk for low birth weight, preterm delivery, and perinatal mortality** |

Legend:

**= Core ERAC Element
ERAC= Enhanced Recovery After Cesarean, SOAP= The Society for Obstetric Anesthesia and Perinatology, ASA= The American Society of Anesthesiologist, ACOG= The American College of Obstetricians and Gynecologists, ACCP= American College of Clinical Pharmacy, ACC= American College of Cardiology, AHA= American Heart Association, WHO= World Health Organization, UNICEF= United Nations International Children's Emergency Fund, TAP= Transversus Abdominal Plane Block, QLB= Quadratus Lumborum Block, NSAID= Nonsteroidal Anti-Inflammatory Drugs, PACU= Post-Anesthesia Care Unit, IONV= Intra-Operative Nausea and Vomiting, PONV= Post-Operative Nausea and Vomiting, post-OP= Postoperative, IV= Intravenous, PO= By Mouth, e.g.= For Example, PRN= When Necessary, g= Gram, mg=Milligram, mcg= Microgram, mL=Milliliter, dL= Deciliter, L= Liter, °F= Degree Fahrenheit, sec=Seconds, min= Minutes, hrs= Hours
### Intraoperative ERAC Elements

Table 2 lists both core and recommended intraoperative elements for ERAC. The aim of these elements is to optimize fluid management, prevent spinal anesthesia induced hypotension, minimize intraoperative nausea and vomiting, initiate multi-modal analgesia, and support early breastfeeding and maternal-infant bonding.

#### Table 2: Intra-Operative Elements

<table>
<thead>
<tr>
<th>Recommendation</th>
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<th>Comments</th>
<th>Level of Evidence</th>
</tr>
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</table>
| Intravenous fluid optimization | • Limit intravenous fluids to <3L for routine cases (suggested) | • In the case of hemorrhage, transition from ERAC to institutional hemorrhage resuscitation protocol  
• In contrast to fluid management in non-obstetric abdominal surgery, spinal anesthesia-associated hypotension in cesarean delivery should be primarily managed with vasopressors, instead of fluid administration | Class Ia; Level C-E\textsuperscript{O}  
Ideals intravenous fluid parameters in cesarean delivery are not well established |
| Prevent and treat spinal anesthesia induced hypotension** | • Goal is to prevent intraoperative nausea/vomiting after spinal anesthesia and maintain uteroplacental perfusion  
• Optimally managed with prophylactic vasopressor infusion: for example phenylephrine (or norepinephrine) infusion | • Spinal anesthesia-associated hypotension is primarily an afterload-driven physiological phenomenon  
• Vasopressor regimen may need to be modified in women with pre-eclampsia as the degree of hypotension with spinal anesthesia may be less than that in non-pre eclamptic women | Class I, Level A  
Preventative and treatment strategies for spinal hypotension are well studied and highly evidence-based |
| Maintain normothermia** | • Active warming: \textit{Example}:  
• In-line IV fluid warmer  
• Forced air warming | • Consider active warming starting pre-operatively  
• Keep the operating room temperature ideally >72°F/22°C (Joint Commission guidance) | Class Ia, Level C-LD |
| Optimal uterotonic administration** | • Use the lowest effective dose of uterotonic necessary to achieve adequate uterine tone and minimize side effects | • Consider evidence-based uterotonic administration  
• In the case of hemorrhage, transition from ERAC to institutional hemorrhage resuscitation protocol | Class Ia, Level B-R |
| Antibiotic prophylaxis** | • Antibiotic prophylaxis dosed prior to skin incision (do not wait until after cord clamping) | • Follow ACOG guidelines | Class I, Level A |
| Intra- and Post-operative nausea and vomiting (IONV/PONV) prophylaxis and treatment** | • Prophylactic vasopressor infusion (see above) to decrease hypotension-associated IONV | • The committee agrees that IONV/PONV is a major stressor for the mother and should be avoided. The different etiologies and prevention/treatments for IONV and PONV need to be considered. | Class I, Level B-R  
for IONV/PONV prophylaxis  
Class Iib, Level C-LD for uterine exteriorization |
Limit/avoid uterine exteriorization and abdominal saline irrigation by surgeon
Combination of at least 2 prophylactic IV antiemetics with different mechanisms of action. Examples:
• 5HT3 antagonist (e.g. ondansetron 4 mg)
• Glucocorticoid (e.g. dexamethasone 4 mg)
• D2 receptors antagonist (e.g. metoclopramide 10 mg)
Limiting/avoid uterine exteriorization which is associated with IONV and delayed bowel function recovery
Abdominal saline irrigation may worsen IONV and PONV
Dexamethasone is effective for PONV not IONV due to delayed onset of action
Metoclopramide is effective for IONV but not PONV

<table>
<thead>
<tr>
<th>Initiates multimodal analgesia**</th>
<th>Neuraxial long-acting opioid</th>
</tr>
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<tbody>
<tr>
<td><strong>Example:</strong></td>
<td>IT morphine 50-150 mcg or</td>
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<td></td>
<td>Epidural morphine 1-3 mg</td>
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</tbody>
</table>
Non-opioid analgesia started in the operating room unless contraindicated:
1. Ketorolac 15-30 mg IV after peritoneum closed
2. Acetaminophen IV after delivery or PO before or after delivery
Consider local anesthetic (continuous) wound infiltration or regional blocks (e.g. transversus abdominis plane block (TAP), quadratus lumborum block (QLB))

Use neuraxial doses consistent with SOAP Center of Excellence criteria
Link: https://soap.org/grants/center-of-excellence/
Non-opioid analgesia ideally started prior to the onset of pain
Rectal acetaminophen may be an alternative but has lower/less reliable bioavailability
The role of wound infiltrations and other regional blocks for post-cesarean pain should be considered in select cases, for example in women who could not receive neuraxial morphine or other multimodal analgesia regimen components, or patients at risk for severe pain.

Class I; Level A
High level of evidence for neuraxial morphine, NSAIDs and acetaminophen. Data to support pre-emptive analgesia in cesarean delivery are limited

<table>
<thead>
<tr>
<th>Promote breastfeeding and maternal-infant bonding**</th>
<th>Skin-to-skin contact should occur as soon as possible in the operating room as appropriate based on maternal/neonatal condition</th>
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<tbody>
<tr>
<td><strong>May require additional nurse support intraoperatively.</strong></td>
<td>Follow your institutions guideline for safe positioning for the newborn while skin-to-skin)</td>
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<tr>
<td><strong>Must be primary responsibility of non-anesthesia care team member</strong></td>
<td>Skin-to-skin intraoperatively supports the “golden hour” of breastfeeding initiation within one hour of birth</td>
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<tr>
<td><strong>Facilitates mother-infant bonding</strong></td>
<td>Suggested techniques to facilitate skin-to-skin intraoperatively include moving electrocardiogram leads and electrodes to the patients back to clear space on the chest; moving equipment to allow nursing personnel space to safely</td>
</tr>
</tbody>
</table>
Class IIA, Level B-R
| **Delayed cord clamping** | • ACOG recommends delay in umbilical cord clamping in vigorous term and preterm infants for at least 30-60 seconds after birth | • Benefits: Term: Improved iron stores, developmental benefits; Preterm: Improved transitional circulation, reduced need for transfusion, lower risk of necrotizing enterocolitis and intraventricular hemorrhage  
• Does not increase maternal risk for blood loss or transfusion  
• The administration of oxytocin should be started after the delivery of the baby  
• The ability to provide delayed cord clamping may vary among institutions and settings  
• Delayed cord clamping should be deferred in certain situations (e.g. maternal instability, fetal/neonatal need for immediate resuscitation; see ACOG opinion 684) | Class I, Level B-R |

**Legend:**
**== Core ERAC Element**
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Postoperative ERAC Elements

Table 3 lists both core and recommended postoperative elements for ERAC. The aims of these postoperative elements include minimizing post-cesarean metabolic stress by early feeding, promoting early mobilization by providing multimodal analgesia, removing physical early mobilization barriers, and facilitating hospital discharge.

**Table 3: Post-Operative Elements**

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Action</th>
<th>Comments</th>
<th>Level of Evidence</th>
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<tbody>
<tr>
<td>Early oral intake**</td>
<td>• Ice chips and/or water within 60 min of admission to PACU</td>
<td>Early oral intake leads to:</td>
<td>Class IIb, Level C-EO</td>
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<tr>
<td></td>
<td>• Heparin/saline lock the IV early once oxytocin infusion complete, tolerating fluids and urine output adequate</td>
<td>• Accelerated return of bowel function</td>
<td>Low level of evidence in the cesarean delivery setting</td>
</tr>
<tr>
<td></td>
<td>• Advance to regular diet ideally within 4 hrs post cesarean, as tolerated</td>
<td>• Reduced hospital length of stay</td>
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<td></td>
<td></td>
<td>• No increased rates of complication</td>
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<td></td>
<td></td>
<td>• No increased risk of postoperative nausea or vomiting</td>
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<td></td>
<td></td>
<td>• Reduced postoperative catabolism</td>
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<td></td>
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<td>• Improved insulin sensitivity</td>
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<td>• Reduced surgical stress response</td>
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<td></td>
<td>Patient with diabetes should ideally be scheduled as the first case of day</td>
<td>Hyperglycemia (&gt;180-200 mg/dL) is associated with poor outcomes including infection and delayed wound healing</td>
<td>Class I, Level B-R</td>
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<tr>
<td></td>
<td>• Maintain normoglycemia (&lt;180-200 mg/dL); check maternal/neonatal glucose as per hospital protocol</td>
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<tr>
<td>Glycemic Control</td>
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<td>Early mobilization**</td>
<td>• Ambulation should occur soon after return of motor function</td>
<td>Early mobilization decreases:</td>
<td>Class I, Level B-NR</td>
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<td></td>
<td>Examples: 0-8hrs Post-op:</td>
<td>• Insulin resistance</td>
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<td></td>
<td>• Sit on edge of bed</td>
<td>• Muscle atrophy</td>
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<td></td>
<td>• Out of bed to chair</td>
<td>• Hypoxia</td>
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<td></td>
<td>• Ambulation as tolerated</td>
<td>• Venous thromboembolism</td>
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<td></td>
<td>8-24hrs Post-op:</td>
<td>• Length of stay</td>
<td></td>
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<tr>
<td></td>
<td>• Ambulation as tolerated</td>
<td>Ambulate only after adequate return of motor function</td>
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<td></td>
<td>• Walk: 1-2 times (or more) in hall</td>
<td>Remove barriers to early mobilization:</td>
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<td></td>
<td>24-48hrs Post-op:</td>
<td>• Intravenous lines and poles</td>
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<td>• Walk: 3-4 times (or more) in hall</td>
<td>• Urinary catheters</td>
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<td></td>
<td>• Out of bed for 8 hrs</td>
<td>• Poor pain control</td>
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<td></td>
<td>**</td>
<td>• Sedation</td>
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<td>**</td>
<td>• PONV</td>
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<td>**</td>
<td>• Dizziness</td>
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<td></td>
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<td>• Slow block regression</td>
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<tr>
<td>Promotion of resting periods**</td>
<td>Optimize sleep and rest</td>
<td>Fatigue potentially negatively impacts cognitive function, increase depression, worsen pain, impair maternal-infant bonding, and may increase risk of respiratory depression</td>
<td>Class IIb, Level C-LD</td>
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<td></td>
<td>• Limit unnecessary interruptions</td>
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<td>Example: clustered interventions (e.g. vital signs assessments in coordination</td>
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<td>Promotion of return of bowel function</td>
<td>with analgesic administration; time scheduled oral analgesics (e.g., NSAIDs and acetaminophen) together • Follow appropriate postoperative monitoring</td>
<td>• See SOAP neuraxial morphine monitoring consensus statement: Link: <a href="https://soap.org/neuraxial-morphine-consensus-statement.php">https://soap.org/neuraxial-morphine-consensus-statement.php</a></td>
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<td>Early urinary catheter removal**</td>
<td>Minimize opioid consumption • Consider chewing gum</td>
<td>Availability of multiple PRN bowel medications for example: Docusate (Colace®), Polyethylene glycol 3350 (Miralax®), Simethicone (Gas Relief®) • Remove barriers to recovery and mobilization</td>
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<tr>
<td>Venous thromboembolism prophylaxis**</td>
<td>Urinary catheter should be removed by 6-12 hrs postpartum • Construct protocols to establish criteria for appropriate removal, and to manage post-catheter removal urinary retention</td>
<td>Benefits include: • Improved ambulation • Shorter length of stay • Lower rates of symptomatic urinary tract infections Earlier catheter removal may be associated with higher rates of urinary retention and need for re-catheterization The dose of neuraxial local anesthetic and opioid can prolong catheter removal time</td>
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<tr>
<td>Multimodal analgesia**</td>
<td>Follow institutional practices as per ACOG and ACCP guidelines</td>
<td>Cesarean delivery approximately doubles the risk of venous thromboembolism, but in otherwise healthy patients the absolute risk is low • ACOG recommends mechanical thromboembolism prophylaxis for all women not already receiving pharmacologic thromboprophylaxis</td>
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</tr>
<tr>
<td>Multimodal analgesia**</td>
<td>Multimodal analgesia protocols include: • Low dose long-acting neuraxial opioid such as morphine (see above) • Scheduled non-steroidal anti-inflammatory drugs (NSAID) • Scheduled acetaminophen • Local anesthetic techniques as indicated Example: • Acetaminophen 650 mg-1000 mg every 6 hrs scheduled • Ibuprofen 600 mg every 6 hrs scheduled after IV Ketorolac</td>
<td>Multimodal analgesia should be used to: • Reduce pain • Improve mobilization • Limit IV opioids in recovery • Reduce in-hospital opioid use • Decrease opioid use after discharge Opioids are associated with nausea/vomiting, sedation, fatigue, ileus, constipation, misuse/addiction risk • Multimodal analgesia (including NSAIDs + acetaminophen) decrease opioid use/side effects by 30-50% • See SOAP Center of Excellence criteria Link: <a href="https://soap.org/grants/center-of-excellence/">https://soap.org/grants/center-of-excellence/</a> • Expectation Management (see Patient Handout 1 and 2 for an example)</td>
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</tbody>
</table>

**Class IIb, Level C-EO Low level of evidence in the cesarean delivery setting

**Class IIb, Level C-EO Limited evidence in the or cesarean delivery setting

**Class IIa, Level B-NR

**High level of evidence for neuraxial morphine, NSAIDs and acetaminophen.
| Facilitate early discharge** | • Standardize discharge planning and coordinate care should start pre-operatively  
• Use metrics to monitor patient progress in meeting early discharge criteria | • Establish patient-oriented goals early  
• Discharge planning on postoperative day 1 should ideally include pediatric, lactation and contraceptive planning  
• Consider personalize and patient-centered opioid prescribing at discharge | Class IIb, Level C-EO |
| Anemia remediation** | • Screen and treat anemia | • Routine hemoglobin check on postoperative day 1 or 2 should be considered in patients experiencing any significant intraoperative bleeding | Class Iia, Level B-R |
| Breastfeeding support** | • Robust lactation support per institutional guideline | Should start immediately after birth by offering skin-to-skin care and continued throughout hospitalization  
• Initial skin-to-skin contact should continue uninterrupted until the completion of the first breastfeeding  
• For formula feed infants, initial skin-to-skin contact should continue uninterrupted for at least one hour  
• After the initial period of skin-to-skin contact, mothers should be encouraged to continue this type of care as much as possible during their hospital stay  
Provide lactation consulting and educational material (Ten steps to successful breastfeeding as documented in the Joint Statement by UNICEF and WHO’s Baby Friendly Hospital Initiative) | Class Iia, Level B-R |

Legend:
**= Core ERAC Element

15-30 mg given after delivery in operating room (see above), or other NSAIDs (e.g. naproxen 500 mg PO every 12 hrs)  
• Oxycodone 2.5 -5 mg PO every 4 hrs PRN pain  
• Pre-emptive or rescue supplemental regional blocks as indicated (see comments)  
• Peripheral nerve blocks (e.g. TAP or QLB), and continuous wound infiltration if available when neuraxial morphine cannot be given, or as a rescue technique when severe breakthrough postoperative pain  
• TAP block does not provide significant improvement when given in addition to neuraxial morphine and scheduled NSAID plus acetaminophen  
• Gabapentinoids have limited benefit as routine analgesic after cesarean but may be appropriate in select patients; use caution in patients on methadone or other QT interval prolonging medications in the electrocardiogram
ACC = American College of Cardiology, AHA = American Heart Association, WHO = World Health Organization, UNICEF = United Nations International Children’s Emergency Fund, TAP = Transversus Abdominal Plane Block, QLB = Quadratus Lumborum Block, NSAID = Nonsteroidal Anti-Inflammatory Drugs, PACU = Post-Anesthesia Care Unit, IONV = Intra-Operative Nausea and Vomiting, PONV = Post-Operative Nausea and Vomiting, post-OP = Postoperative, IV = Intravenous, PO = By Mouth, e.g. = For Example, PRN = When Necessary, g = Gram, mg = Milligram, mcg = Microgram, mL = Milliliter, dL = Deciliter, L = Liter, °F = Degree Fahrenheit, sec = Seconds, min = Minutes, hrs = Hours
REFERENCES

Background:

Class of Recommendations and Level of Evidence:

Preoperative ERAC:

Intraoperative ERAC References:

Postoperative ERAC References:

**Postoperative Oral Intake:**


**Perioperative Glycemia Management:**


**Postoperative Mobilization:**


**Limiting Interruptions/Interventions:**

15. ACOG Committee Opinion No. 766 Summary: Approaches to Limit Intervention During Labor and Birth. Obstet Gynecol 2019;133(2):406-408

**Urinary Decatheterization:**


**Postpartum Analgesia:**


Discharge Planning:

Breastfeeding support:
APPENDICES

For Providers
1. Clinical Guideline Classification System of the American College of Cardiology/ American Heart Association (ACC/AHA)

For Patients (Please Modify Templates Before Use)
2. Enhanced Recovery After Cesarean (ERAC) Infographic
3. Patient Handout 1: Enhanced Recovery After Cesarean (ERAC) Flyer
4. Patient Handout 2: Enhanced Recovery After Cesarean (ERAC) Steps for Faster Recovery After Cesarean Delivery Table
5. Patient Facing Enhanced Recovery After Cesarean (ERAC) Poster
Welcome to **Name of your Hospital**

**Things To Be Done Before You Go Home**

**MOM**

**First 24 hours after your surgery:**
- Eat and drink within 4 hours after your surgery
- Sit up in bed within 4 hours after your surgery
- Walk within 8 hours after your surgery
- Breastfeeding teaching with nurse
- Needed blood tests
- Talk about birth control with your obstetrician
- Walk 4 times a day

**Next days after your surgery:**
- Obstetric team visit on the day of discharge
- Review home care instructions with nurse
- Make sure your prescriptions are ready
- Walk 4 times a day
- Talk to your team if you have questions (for example contraception questions)

**BABY**

**First 24 hours after your surgery:**
- Pick a doctor for your baby
- Hepatitis B vaccine
- Hearing check
- Routine blood checks
- Oxygen level check

**Next days after your surgery:**
- Complete birth certificate form/social security
- Bring car seat before day of discharge
- Pediatric team visit on day of discharge

**Available Classes and Resources**

**Breastfeeding Classes:**
- Time:
- Place:

**Car Seat Classes:**
- Time:
- Place:

Courtesy Lucile Packard Children’s Hospital-Stanford University, Palo Alto, CA
What is Enhanced Recovery after Cesarean Section (ERAC)?

ERAC is a step by step plan to help you feel better faster after your Cesarean Section. Research has shown this plan helps you to manage your pain better, and help you start eating and moving soon after your surgery.

Spinal Anesthesia

Most scheduled Cesarean Sections are done with a spinal or combined spinal-epidural anesthetic.

The spinal medicine will make your body go numb from your chest down through your legs. The surgery will not start until you are numb. It is normal to feel some pressure and tugging during your Cesarean Section, but you will feel minimal to no pain. Let your anesthesia provider know if you felt any pain or discomfort.

How is a Spinal Anesthesia given?

A numbing medicine will be placed on your back where the anesthetic will be placed. If you feel discomfort, more numbing will be given. You may feel pressure when the medicine is given, but it should not be painful. After a few minutes your legs will start to feel numb.

Frequently asked questions

How long will I be in the Hospital?
If you have Cesarean Section, you will be in the hospital for around 3 days. Women with complications might need to stay longer.

I am very nervous about my Cesarean Section, can I be asleep for it?
Spinal anesthesia is safer. General anesthesia, or being asleep for your Cesarean Section, has risks for mom and baby and is usually reserved for emergencies.

Can my partner stay with me during my Cesarean Section?
Yes, your partner can stay with you during your Cesarean Section. If there is an emergency your partner will be escorted out of the operation room, so the anesthesia team can focus on taking care of you.

Can I still hold my baby to my chest if I am having a Cesarean Section?
Yes. Doctors will check your baby right after birth and if s/he is doing well, and it is a safe time during surgery, the baby will be brought to you for skin-to-skin.

Courtesy Lucile Packard Children’s Hospital- Stanford University, Palo Alto, CA
# Enhance Recovery After Cesarean (ERAC) Patient Handout 2
Steps for Faster Recovery After Cesarean Delivery

<table>
<thead>
<tr>
<th></th>
<th>Before Delivery</th>
<th>Just before and during your Cesarean Delivery</th>
<th>First 24 hours after your surgery</th>
<th>24 hours before your hospital discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pain control</strong></td>
<td>Take medicines as instructed by your anesthesia and obstetric providers</td>
<td>You will receive spinal or epidural anesthesia for your Cesarean delivery</td>
<td>Take pain medicines as directed</td>
<td>Take pain medicines as directed</td>
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<td></td>
<td></td>
<td></td>
<td>If needed, ask for medicines for itching, nausea and shivering</td>
<td>Continue skin-to-skin contact with your baby</td>
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<tr>
<td><strong>Skin care</strong></td>
<td>Don’t shave pubic hair the day before or day of your Cesarean</td>
<td></td>
<td>Do not touch your incision site</td>
<td>Bandage over incision is removed</td>
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<tr>
<td></td>
<td>Shower or bathe and wait until you are completely dry before using the disinfectant wipes night before surgery</td>
<td></td>
<td></td>
<td>You may shower or bathe</td>
</tr>
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<td></td>
<td></td>
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<td></td>
<td>Follow wound care instructions</td>
</tr>
<tr>
<td><strong>Eating and drinking</strong></td>
<td>You may eat until 6-8 hours before your Cesarean delivery</td>
<td></td>
<td>You may start chewing gum while in recovery</td>
<td>Eat healthy foods, that are easy to digest</td>
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<td></td>
<td>You may drink clear liquid (water) or a carbohydrate-containing drink up to 2 hours before surgery</td>
<td></td>
<td>You may eat and drink as soon as you feel you are ready</td>
<td>Drink 8-10 large glasses of water each day</td>
</tr>
<tr>
<td>Activity</td>
<td>Normal</td>
<td>With the assistance of your nurse:</td>
<td>Walk at least 4 times every day</td>
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<td></td>
<td>Sit up in bed within 4 hours after surgery</td>
<td>Sit up in bed within 4 hours after surgery</td>
<td>Don’t lift anything heavier than your baby</td>
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</tr>
<tr>
<td></td>
<td>Walk within 8 hours after surgery</td>
<td>Walk within 8 hours after surgery</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Walk at least 4 times every day</td>
<td>Walk at least 4 times every day</td>
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<tr>
<td></td>
<td>Don’t lift anything heavier than your baby</td>
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<tr>
<td>Breastfeeding</td>
<td>Discuss breastfeeding with your care team</td>
<td>Communicate your breastfeeding preference with your care team</td>
<td>Start breastfeeding as soon as possible after birth</td>
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<td></td>
<td>If you plan to pump at home plan for it</td>
<td>Ask for lactation support and inform yourself how to hand express to help stimulate your milk supply</td>
<td>Breastfeed at least every 3 hours or more often if baby is hungry</td>
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<td></td>
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<td>Your nurse and lactation services can address any question you have</td>
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<td></td>
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<td></td>
<td>Try attend a breastfeeding class</td>
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<tr>
<td>Other Steps</td>
<td>Don’t smoke as smoking may delay your recovery from surgery</td>
<td></td>
<td>Review discharge instructions</td>
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<td></td>
<td>Talk to your doctor about programs to stop smoking</td>
<td></td>
<td>Schedule follow-up appointments with your obstetric provider and pediatrician</td>
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</tbody>
</table>
**Pre-op**
- **ERAC CORE ELEMENTS**
  - Limit fasting interval
  - Non-particulate liquid-carbohydrate loading
  - Patient education
- **ERAC RECOMMENDED ELEMENTS**
  - Lactation/breastfeeding preparation and support
  - Hemoglobin optimization

**Intra-op**
- **ERAC CORE ELEMENT**
  - Prevent spinal anesthesia induced hypotension
  - Maintain normothermia
  - Antibiotic prophylaxis
  - Intra and postoperative nausea and vomiting prophylaxis
  - Initiate multimodal analgesia
  - Promote breastfeeding and maternal-newborn bonding
  - Optimal uteroronic administration
- **ERAC RECOMMENDED ELEMENTS**
  - Intravenous fluid optimization
  - Delayed cord clamping

**Post-op**
- **ERAC CORE ELEMENTS**
  - Early oral intake
  - Early mobilization
  - Promotion of resting period
  - Early urinary catheter removal
  - Multimodal analgesia
  - Facilitate early discharge
  - Venous thromboembolism prophylaxis
  - Anemia remediation
  - Breastfeeding support
- **ERAC RECOMMENDED ELEMENTS**
  - Glycemic control
  - Promotion of return of bowel function