Provincial Clinical Knowledge Topic

Enhanced Recovery for all Surgeries, Adult – Inpatient

V 1.0
Important Information Before You Begin

A Provincial Clinical Knowledge Topic is the evidence-informed clinical best practice standard for a specific patient population. Enhanced recovery after surgery (ERAS) Topic content is based on recommendations from published international guidelines and other evidence, with consideration for current practices at ERAS sites and other clinical standards. Topic information strives to adhere to Institute for Safe Medication Practices (ISMP) safety standards, and align with provincial and national Quality and Safety initiatives and standards, e.g. Health Quality Council Alberta (HQCA), Choosing Wisely, Safer Healthcare Now, and Accreditation Canada. The Topic will be reviewed periodically and updated according to best practice evidence and other clinical recommendations and guidelines.

Clinicians using this Topic should, in consultation with the patient, use independent medical judgement in the context of individual clinical circumstances to direct care.

Guidelines

This Topic is based on the following guidance:


Keywords

- ERAS
- Enhanced recovery
- Surgery
- Adult
Rationale

International ERAS guidelines were developed to improve patient outcomes, accelerate recovery after surgery, and reduce healthcare costs. ERAS is a multimodal approach, with interventions across all stages of surgical care. Refer to Enhanced Recovery After Surgery: A Review.

The international ERAS guidelines were used in the refinement of provincial clinical care pathways for enhancing recovery after surgery. There are Alberta Health Services (AHS) ERAS clinical care pathways developed for Breast Reconstruction (not applicable outside of Foothills Medical Centre and Misericordia Community Hospital), Colorectal, Cystectomy, Gynecologic Oncology (not applicable outside of Foothills Medical Centre and Royal Alexandra Hospital), Liver, Major Gynecology, Major Head and Neck (not applicable outside of Foothills Medical Centre and University of Alberta Hospital), and Pancreas surgery. These clinical care pathways are detailed in surgery-specific ERAS Topics.

Certain criteria must be met for a patient to be considered for inclusion in one of the ERAS clinical care pathways. See the Rationale section in each ERAS Topic for specific surgical procedures appropriate for inclusion.

Application of the Enhanced Recovery for all Surgeries, Adult - Inpatient clinical care pathway may be considered for any adult inpatient scheduled for surgery within Alberta for a procedure that is not Breast Reconstruction, Colorectal, Cystectomy, Gynecologic Oncology, Liver, Major Gynecology, Major Head and Neck, or Pancreas surgery.
Goals of Management

The goals of clinical management for enhancing recovery of scheduled adult inpatient surgical patients are to

1. Decrease
   - surgical care length of stay (acute and total) with no increase in readmissions or use of emergency, specialty or primary care related to the post-surgical care
   - surgical complications delaying discharge
   - serious surgical complications including reoperations

2. Increase
   - positive surgical care experiences for patients and families, and providers
   - compliance with ERAS recommendations

This can be achieved by engaging patients and families, clinicians and staff in a multidisciplinary evidence-informed ERAS clinical care pathway focused on

- patient preparation that includes preoperative optimization, an explanation of the surgical procedure, as well as postoperative expectations and goals to maximize patient participation in their surgical care journey
- preoperative fasting and carbohydrate loading following national anesthesia guidelines
- appropriate prophylaxis to prevent or reduce surgical complications including venous thromboembolism (VTE), surgical site infections, nausea and vomiting
- multimodal, opioid-sparing analgesic approaches to improve the management of perioperative pain, nausea and vomiting
- management of physiological surgical stress response
• maintenance of normothermia
• minimally invasive surgical approaches
• balanced fluid management
• avoidance of, or early removal of drains and tubes
• mobilization soon after surgery
• stimulation of gut motility
• offer of food and drinks soon after surgery with appropriate nutrition supplements

Enhanced Recovery for all Surgeries, Adult – Inpatient: Recommendations

ERASAlberta recommendations are based on ERAS® Society Guidelines and other evidence, with consideration for current practices at ERAS sites and other clinical standards.

Preoperative information, education and counselling
ERASAlberta Recommendation: Patients should routinely receive dedicated preoperative counselling.

Preoperative optimization
ERASAlberta Recommendation: Smoking and alcohol consumption should be stopped four weeks before surgery. Increasing exercise preoperatively may be of benefit. Anemia should be actively identified, investigated, and corrected preoperatively. Patients should be screened for nutritional status including weight loss within the previous 6 months. All patients at nutrition risk need an assessment to confirm malnutrition. If a patient is malnourished, an in-depth nutrition assessment, along with treatment, is required by a dietitian.

Preoperative bowel preparation
ERASAlberta Recommendation: Mechanical bowel preparation should not be used routinely.

Preoperative fasting and carbohydrate load treatment
ERASAlberta Recommendation: Before scheduled procedures, the minimum duration of preoperative fasting should be 8 hours after a meal that includes meat, fried or fatty foods, 6 hours after a light meal (such as toast and a clear fluid), and 2 hours after clear fluids as per the Canadian Anesthesiologists’ Society Guidelines to the Practice of Anesthesia - Revised Edition 2018. Carbohydrate load treatment should occur between 2 and 3 hours prior to the administration of anesthesia.

Note: The Provincial Clinical Knowledge Topic: Perioperative Diabetes Management is under development and will further inform the ERASAlberta recommendation.

Pre-anesthetic medication
ERASAlberta Recommendation: Patients should not routinely receive long acting sedative medication before surgery.

Venous thromboembolism prophylaxis
ERASAlberta Recommendation: Patients should have a sequential compression device (SCD) applied, and receive preoperative or intraoperative pharmacological prophylaxis with heparin. Extended prophylaxis with low molecular weight heparin (LMWH) should be given for
an additional 28 days post discharge to patients with cancer or other patients with increased risk of venous thromboembolism (VTE).

**Antimicrobial prophylaxis and skin preparation**
**ERASAlberta Recommendation:** As per Bugs & Drugs, routine prophylaxis using intravenous antibiotics should be given within 60 minutes prior to incision. Additional doses should be given during prolonged operations according to the half-life of the drug used. Surgical site skin preparation with chlorhexidine-alcohol should be used prior to incision.

**Prevention of postoperative nausea and vomiting (PONV)**
**ERASAlberta Recommendation:** All patients need to be preoperatively assessed for risk and provided with perioperative PONV prophylaxis accordingly. A multimodal approach to PONV prophylaxis should be adopted in all high risk patients.

**Standard anesthetic protocol**
**ERASAlberta Recommendation:** Emphasis is placed on using short acting anesthetic agents with consideration for the use of total intravenous anesthesia (TIVA) instead of inhalation anesthetic. Opioids should be used sparingly and if needed, short acting opioids are recommended.

**Prevention of intraoperative hypothermia**
**ERASAlberta Recommendation:** Maintenance of normothermia with suitable active warming devices should be used routinely to maintain body temperature between 36 to 38°C.

**Perioperative fluid management**
**ERASAlberta Recommendation:** Very restrictive or liberal fluid regimes should be avoided in favor of euvolemia. The use of advanced hemodynamic monitoring to facilitate individualized fluid therapy during the perioperative period should be considered, especially for high risk patients and patients for which significant intravascular volume loss is anticipated. Balanced crystalloid solutions are preferred to sodium chloride 0.9%. The enteral route for fluid postoperatively should be used as early as possible, and intravenous fluids should be discontinued as soon as clinically appropriate.

**Nasogastric tubes**
**ERASAlberta Recommendation:** Routine nasogastric intubation should be avoided. Nasogastric tubes inserted during surgery should be removed before reversal of anesthesia.

**Surgical site drains**
**ERASAlberta Recommendation:** The routine use of surgical site drains is not recommended.

**Urinary drainage**
**ERASAlberta Recommendation:** If a urinary catheter is required for postoperative bladder drainage, it should be used for a short period, preferably less than 24 hours postoperatively.

**Prevention of postoperative ileus**
**ERASAlberta Recommendation:** A multimodal approach to optimizing gut function should involve gum chewing and oral magnesium.
Postoperative analgesia
ERASAlberta Recommendation: The use of multimodal opioid-sparing strategies is recommended.

Postoperative glucose control
ERASAlberta Recommendation: ERAS elements that reduce metabolic stress should be employed to reduce insulin resistance and the development of hyperglycemia. Insulin therapy to maintain normoglycemia is recommended, if applicable.
Note: The Provincial Clinical Knowledge Topic: Perioperative Diabetes Management is under development and will further inform the ERASAlberta recommendation.

Postoperative nutritional care
ERASAlberta Recommendation: Patients should be encouraged to take normal food as tolerated, as soon as awake and alert after surgery. Oral nutrition supplements (ONS) should be used to supplement total caloric and protein intake.

Early mobilization
ERASAlberta Recommendation: Patients should be encouraged to mobilize, starting the evening of postoperative day 0.

Audit outcomes and compliance
ERASAlberta Recommendation: A systematic audit is essential to determine clinical outcomes and measure overall compliance with clinical recommendations. Reporting on patient experience and functional recovery using validated tools may also be useful.

Clinical Decision Support
The Enhanced Recovery for all Surgeries, Adult – Inpatient Topic is intended to guide clinicians in enhancing surgical care for patients not included in the Breast Reconstruction, Colorectal, Cystectomy, Gynecologic Oncology, Liver, Major Gynecology, Major Head and Neck, or Pancreas surgery ERAS clinical care pathways.

The ERAS clinical knowledge and patient information contained within this Topic are intended to be used as a comprehensive package applied to a surgical care population. All recommendations should be applied to all eligible patients. The anticipated benefits of care management are reduced if the clinical care pathway is applied selectively.

Clinical decision support tools relevant to the Enhanced Recovery for all Surgeries, Adult - Inpatient clinical care pathway include the following

AHS Eating and Drinking Before Surgery: Patient Instructions
Canadian Nutrition Screening Tool (CNST) – Appendix A
Choosing Wisely Canada: Drop the Pre-Op Toolkit
Canadian Anesthesiologists’ Society Guidelines to the Practice of Anesthesia - Revised Edition 2018

Enhanced Recovery for all Surgeries, Adult – Inpatient V 1.0
AHS Venous Thromboembolism Prophylaxis Guideline

Bugs & Drugs

Consensus Guidelines for the Management of Postoperative Nausea and Vomiting

AHS Use of Aprepitant (Emend®) for Prevention of Postoperative Nausea and Vomiting (PONV) in Adults

Choosing Wisely Canada: Recommendations and Resources, by Specialty

Other important clinical information relevant to the Enhanced Recovery for all Surgeries, Adult - Inpatient clinical care pathway can be found in References and Additional Information.

Enhanced Recovery for all Surgeries, Adult – Inpatient Preoperative Order Set

Order Set Components

Order Set Keywords: ERAS, Preadmission, Preoperative, Surgery

Admit, Transfer, Discharge

☐ Anticipated Date of Discharge:____________________________________________________

Patient Teaching

☑ Teach: provide ERAS patient teaching material and discuss perioperative patient goals
  - On the Road to Your Recovery: A Patient’s Guide to ERAS (link to be added once available; please contact ERASAlberta@AHS.ca to request)

☐ Teach: provide AHS Eating and Drinking Before Surgery: Patient Instructions

☒ Teach: provide site-specific patient material

☐ Teach: review current medications for stop/continue/hold (e.g., anticoagulants)

Consults and Referrals

☐ Physician Consult: Anesthesia

☐ Physician Consult: Internal Medicine

If a stoma is anticipated choose Enteroostomal Therapy Nurse:

☐ Enteroostomal Therapy Nurse Referral

If Canadian Nutrition Screening Tool (CNST) – Appendix A score equals 2 Yes answers choose Dietitian Referral:

☐ Dietitian Referral

Laboratory Investigations (refer to Choosing Wisely Canada: Drop the Pre-Op Toolkit)

☐ Complete Blood Count (CBC)

☐ PT INR

☐ PTT

☐ Creatinine/eGFR
Electrolytes (Na, K, Cl, CO₂)  
Hemoglobin A1C

*If patient has diabetes choose Blood Glucose Monitoring point-of-care testing (POCT):*

Blood Glucose Monitoring POCT: AM of surgery

Type and Screen

**Diagnostic Investigations**  
*Refer to Choosing Wisely Canada: Drop the Pre-Op Toolkit*

GR Chest, 2 Projections (Chest X-Ray PA and Lateral)  
Electrocardiogram

**Bowel Preparation**

- Bowel preparation not required

**Diet**  
*Refer to page 83 of Canadian Anesthesiologists’ Society Guidelines to the Practice of Anesthesia - Revised Edition 2018*

- Assess the timing of the last light meal and last clear fluids. The minimum duration of preoperative fasting prior to the administration of anesthesia should be:
  - 8 hours after a meal that includes meat or fried or fatty foods
  - 6 hours after a light meal (such as toast and a clear fluid)
  - 2 hours after clear fluids

*If the patient has not received their carbohydrate load treatment between 2 and 3 hours prior to the scheduled surgery time, choose Carbohydrate Load Treatment (refer to ERAS Consensus Statement for Anaesthesia Practice and Juice as Carbohydrate Loading Products – Appendix B).*

Carbohydrate Load Treatment: clear juice (either cranberry cocktail or apple juice)  
500mL PO, between 2 and 3 hours prior to the administration of anesthesia

**Intravenous Therapy**

- Intravenous Cannula: insert in Operating Room *(recommended)*
- Intravenous Cannula: insert in day surgery area, apply saline lock
- Intravenous Cannula: insert in day surgery area, use infusion pump and lactated ringer’s infusion IV at no greater than 30 mL/hour

**Medications**

**VTE Prophylaxis**  
*Refer to AHS Venous Thromboembolism Prophylaxis Policy and Guideline*

Consider dose adjustment in patients with reduced renal function or extremes of weight.

- heparin 5000 units SUBCUTANEOUSLY once preoperatively or to be given in Operating Room as per local institutional practices; recommended to be given after epidural insertion, if applicable

**Antibiotic Prophylaxis**

Refer to Bugs & Drugs for specific antibiotic recommendations based on surgery type and clinical indications. Antibiotics should be given within 60 minutes of incision and be fully infused prior to skin incision.
Analgesics
- acetaminophen 1000 mg PO once preoperatively, to be given 1 hour prior to surgery
- gabapentin 300 mg PO once preoperatively, to be given 1 hour prior to surgery

*Use caution for patients with renal impairment or at high risk of acute kidney injury.*

OR
- ibuprofen 400 mg PO once preoperatively, to be given 1 hour prior to surgery

Antiemetics (refer to Consensus Guidelines for the Management of Postoperative Nausea and Vomiting)
- Assess the patient and determine their simplified risk score from Apfel et al. to predict their risk for developing postoperative nausea and vomiting (PONV)

  - If PONV risk score is 0 or 1 consider no prophylaxis:
    - PONV prophylaxis not required

  - If PONV risk score is 2 consider ondansetron:
    - ondansetron 4 mg PO once preoperatively, to be given 1 hour prior to surgery

  - If PONV risk score is 3 or greater use a multi-modal approach with at least one preoperative antiemetic and additional intraoperative antiemetics. If the patient meets AHS restrictions for PONV prophylaxis with aprepitant using AHS Use of Aprepitant (Emend) for Prevention of PONV in Adults choose aprepitant:
    - aprepitant 80 mg PO once preoperatively, to be given 1 hour prior to surgery

  - If PONV risk score is 3 or greater use a multi-modal approach with at least one preoperative antiemetic and additional intraoperative antiemetics. If the patient does not meet AHS restrictions for PONV prophylaxis with aprepitant choose ondansetron:
    - ondansetron 4 mg PO once preoperatively, to be given 1 hour prior to surgery

Other Medications
- Do not order/give anticoagulants ______ days prior to surgery

Patient Care
- Goals of Care Designation (refer to AHS Advance Care Planning & Goals of Care Designation Policy and Procedure)
- Antibiotic Resistant Organism (ARO) Screen as per local institutional practices
- Apply sequential compression device (SCD)
- Apply forced-air warming device (e.g., Bair Hugger, Bair Paws)
Enhanced Recovery for all Surgeries, Adult – Inpatient Intraoperative Order Set

Order Set Components

Order Set Keywords: ERAS, Intraoperative, Anesthesia, Surgery

Patient Care

☑️ Apply sequential compression device (SCD)
☑️ Apply forced-air warming device (e.g., Bair Hugger, Bair Paws)

Normothermia

☑️ Temperature: maintain normothermia
- Operating Room temperature at least 20°C
- Forced-air warming device used for all procedures lasting longer than 30 minutes to achieve/maintain a temperature between 36 to 38°C throughout the perioperative period
- Measure and document patient’s temperature intraoperatively
- Fluid warmers used for procedures in which 1 litre of fluid or greater is expected to be administered

Postoperative Nausea and Vomiting (PONV) prophylaxis (refer to Consensus Guidelines for the Management of Postoperative Nausea and Vomiting)
- Provide multimodal prophylaxis with consideration to patient’s PONV risk score and administration of preoperative PONV prophylaxis

Pain Management

- Consider the use of regional anesthesia (transversus abdominis plane [TAP] block, rectus sheath block) or thoracic epidural analgesia (TEA) if applicable, and discuss decision with surgical team
- Use opioids sparingly. If needed, short acting opioids are recommended. Long acting opioids should be avoided. Patients with preoperative chronic pain may require additional assessment based on their best possible medication history (BPMH). Consider non-opioid analgesia or appropriate opioid-sparing adjuncts

ERAS Guidance

- Consider the use of total intravenous anesthesia (TIVA) instead of inhalation anesthetic
- Avoid routine nasogastric intubation
- Fluid therapy goal is to maintain euvoilema. If appropriate, use goal-directed fluid management to guide fluid therapy especially for high risk patients and for patients undergoing surgery with significant intravascular volume losses anticipated
- Avoid use of surgical site drains
- Remove indwelling urinary catheter upon completion of procedure, if applicable
Enhanced Recovery for all Surgeries, Adult – Inpatient Postoperative Order Set

Order set Components
Order Set Keywords: ERAS, Postoperative, Surgery

Admit, Transfer, Discharge
☐ Anticipated Date of Discharge:______________________________________________

Patient Care
☑ Goals of Care Designation (refer to AHS Advance Care Planning & Goals of Care Designation Policy and Procedure)
☑ Apply sequential compression device (SCD), discontinue when ambulating well
☐ Wound Dressing Instructions:_______________________________________________

Monitoring
☑ Postoperative Vital Signs: assess as per local institutional practices
☑ Opioid Monitoring: monitor as per local institutional practices
☑ Pain Score and Nausea Score: assess at least every 4 hours x 3 days and then every 8 hours, attempt to maintain pain score less than 4/10 and nausea score less than 2/10
☑ Intake and Output: assess every 8 hours x 4 days, include strict oral intake
☑ Indwelling Urinary Catheter (e.g., Foley): remove on postoperative day (POD) 1 in AM
☑ In and Out Urinary Catheter: insert PRN (for urinary retention) once indwelling urinary catheter removed
☑ Patient Weight: assess daily x 3 days, start on POD 1
☑ Surgical Incisions: assess every 8 hours and PRN

Respiratory Care
☑ Incentive Spirometry: perform every 1 hour while awake
☑ Oxygen Therapy: titrate to saturation, maintain SpO2 greater than 92%
☑ Head of Bed: elevate to at least 30° while patient on opioids or epidural

Intravenous Therapy
Fluid therapy goal is to maintain euvolemia. Urine output, blood pressure, heart rate and patient’s mental status are all indicators of patient volume status.
Choose ONE:
☐ lactated ringer’s infusion IV at 50 mL/hour, stop when drinking well (when patient tolerates 800 mL oral intake)
☐ potassium chloride 20 mmol in dextrose 5% (D5W) – sodium chloride 0.45% infusion IV at 50 mL/hour, stop when drinking well (when patient tolerates 800 mL oral intake)

Medications
Ensure best possible medication history (BPMH) and medication reconciliation completed. In hospital medications to be ordered by authorized prescriber.
VTE Prophylaxis (refer to AHS Venous Thromboembolism Prophylaxis Policy and Guideline)
Patients at increased risk of VTE should be considered for extended prophylaxis (up to 4 weeks post discharge) with low molecular weight heparin (LMWH).

- Follow orders for AHS VTE Prophylaxis Adult Patient Care, administer every 24 hours, start evening of POD 0

Gastrointestinal Prophylaxis
If patient is at risk for increased acid production choose ONE:
- pantoprazole EC tab 40 mg PO daily before breakfast until discharge
- ranitidine 150 mg PO BID until discharge

Bowel Stimulation
- Chew gum 3 times daily (minimum 30 minutes each time), as tolerated

Choose ONE:
- magnesium gluconate 1000 mg PO BID, start on POD 1 and discontinue after first bowel movement
- magnesium hydroxide 30 mL PO BID, start on POD 1 and discontinue after first bowel movement

Analgesics
Use opioid-sparing multimodal analgesia. If needed, short acting opioids are recommended. Long acting opioids should be avoided. Consider non-opioid analgesia or appropriate opioid-sparing adjuncts. Attempt to maintain pain score less than 4/10.

Prophylaxis Analgesics
Use caution to ensure acetaminophen from all sources does not exceed 4000 mg per 24 hours.

- acetaminophen 1000 mg PO every 6 hours x 48 hours and then acetaminophen 1000 mg PO every 6 hours PRN for pain to a maximum of 4000 mg acetaminophen per 24 hours from all sources

Use caution for patients with renal impairment or at high risk of acute kidney injury.

- ibuprofen 400 mg PO every 6 hours x 48 hours and then ibuprofen 400 mg PO every 6 hours PRN for pain

PRN Oral Opioids (for pain not controlled by non-opioid analgesia)
Consider dose reduction in the elderly.

Choose ONE:
- oxyCODONE 5 to 15 mg PO every 4 hours PRN for pain not controlled by non-opioid analgesia

Use caution to ensure acetaminophen from all sources does not exceed 4000 mg per 24 hours.

- traMADol/acetaminophen 37.5 mg/325 mg 1 to 2 tabs PO every 6 hours PRN for pain not controlled by non-opioid analgesia to a maximum of 4000 mg of acetaminophen per 24 hours from all sources
PRN Parenteral Opioids (for pain not controlled by oral opioids, or oral analgesia is contraindicated)
Consider dose reduction in the elderly.
Choose ONE:
- morphine _____ mg IV/SUBCUTANEOUSLY every ______ hour(s) PRN for pain not controlled by oral opioids
- HYDROMorphone _____ mg IV/SUBCUTANEOUSLY every ______ hour(s) PRN for pain not controlled by oral opioids

Antiemetics (refer to Consensus Guidelines for the Management of Postoperative Nausea and Vomiting)
- Nausea Score: assess with vital signs and prior to routine antiemetic administration, attempt to maintain nausea score less than 2/10

Prophylaxis Antiemetics
Consider dose reduction in the elderly.
- ondansetron 4 mg PO/IV (or ODT if difficulty swallowing or active vomiting with no IV access) every 8 hours x 48 hours and then 4 to 8 mg every 8 hours PRN for nausea score greater than 2/10

PRN Antiemetics (for PONV not controlled by prophylactic antiemetics)
Consider dose reduction in the elderly.
- metoclopramide 10 mg PO/IV/IM every 6 hours PRN for nausea score greater than 2/10
- dimenhydrinate 25 to 50 mg PO/IV/IM every 4 hours PRN for nausea score greater than 2/10

Other Medications
- Follow orders for AHS Basal Bolus Insulin Therapy (BBIT) and see Provincial Clinical Knowledge Topic: Basal Bolus Insulin Therapy, Adult – Inpatient

Laboratory Investigations (refer to Choosing Wisely Canada: Pathology Recommendations)
- Complete Blood Count (CBC) on POD 1 in AM
- Electrolytes (Na, K, Cl, CO₂) on POD 1 in AM
- Creatinine on POD 1 in AM

Diet
- Post-Surgical Transition Diet: start on POD 0
- Regular Diet: start on POD 1
- Regular Diabetic - Adult Diet: start on POD 1

Protein/Calorie Dense Oral Nutrition Supplements
Appropriate when patient is on any type of oral diet including Gluten Free and Diabetic – Adult. Suitable for lactose intolerance but NOT appropriate for dairy allergy. Achieve a supplement intake of 300 kcal/day on POD 0 and 600 kcal/day on POD 1 until discharge.
- Ensure Enlive: 90 mL PO 3 times daily, start on POD 0 and then 90 mL PO 5 times daily, start on POD 1 until discharge
Activity

- Activity as tolerated with the following goals
  - POD 0: stand at bedside, up in chair, walk to doorway and back; activity goal is 2 hours
  - POD 1: up in chair for 1 hour each meal (breakfast, lunch and supper), ambulate at least 3 times daily (minimum 20 minutes each time); activity goal is 4 hours
  - POD 2 until discharge: up in chair for 1.5 hours each meal (breakfast, lunch and supper), ambulate at least 3 times daily (minimum 30 minutes each time); activity goal is 6 hours daily
- Assess for physiotherapy needs on POD 1. Notify physiotherapist if preoperative mobility concerns or if patient requires more than one-person assist

Patient Teaching

- Teach: implement LMWH teaching in preparation for home therapy, if applicable

Consults and Referrals

- Dietitian Referral
- Physiotherapy Referral
- Social Work Referral
- Transition Services Referral

Rural Considerations

The ERAS clinical knowledge and patient information contained within each Topic are intended to be used as a comprehensive package to maximize the anticipated benefits of care management. Considerations for application of ERAS clinical care pathways (developed for Breast Reconstruction, Colorectal, Cystectomy, Gynecologic Oncology, Liver, Major Gynecology, Major Head and Neck, and Pancreas surgery) in rural surgical facilities within Alberta include

- Surgical procedure criteria must be met (see the Rationale section in each ERAS Topic).
  - Adult inpatients scheduled for Breast Reconstruction, Colorectal, Cystectomy, Gynecologic Oncology, Liver, Major Gynecology, Major Head and Neck, or Pancreas surgery who do not meet the inclusion criteria for the ERAS clinical care pathway may still be considered for applicable recommendations of that pathway (see the Recommendations section in each ERAS Topic)
  - Adult inpatients scheduled for any other type of surgery may be considered for the Enhanced Recovery for all Surgeries, Adult - Inpatient clinical care pathway
- Clinical expertise (e.g., surgeon, anesthesia and nursing), clinical support services (e.g., nutrition, pharmacy, physiotherapy, laboratory, diagnostic imaging, physiotherapy), and additional resources (e.g., medications, nutrition supplements, sequential compression devices, active warming devices) are available for the duration of clinical care from admission to discharge (see the Recommendations section in each ERAS Topic)
  - There must also be site physician and operations leadership, a site team focused on learning and collaboration, and processes and resources to audit outcomes and compliance
Disposition Planning

Discharge
Prior to patient discharge from the ERAS clinical care pathway, the following should be considered

- Patient is medically stable
- Patient is functioning close to or at preoperative level for activities of daily living
- Patient is passing gas or stool
- Patient is tolerating solid food
- Patient’s pain is well controlled (pain score less than 4/10) on oral analgesia
- Patient’s nausea is well controlled (nausea score less than 2/10) with no vomiting
- Patient’s incisions and/or wounds are healing and managed with appropriate wound care products

- Discharge medication list and prescription(s) have been provided to patient
- Discharge teaching is complete and a copy has been provided to patient
- Transition Services/Home Care Services have been arranged, if required
- Wound care/negative-pressure wound therapy supplies have been arranged, if required

- Patient has been referred to the following education resources
  - On the Road to Your Recovery: A Patient’s Guide to ERAS (link to be added once available; please contact ERASAlberta@AHS.ca to request)
  - My Health Alberta
    - Patient Care Webpages including After Surgery and Incision Care After Surgery
    - Patient Care Handouts including Before and After Surgery - Adult - What to Expect at Home
    - Patient Care Videos including Before and After Surgery – Preventing Problems After Surgery

Outpatient follow-up

- If applicable, patient to have staples removed in 7 to 10 days by family physician or in surgeon’s clinic
- Patient to follow up with family physician or surgeon in 4 to 6 weeks

Analytics

Outcome Measure #1

<table>
<thead>
<tr>
<th>Name of Measure</th>
<th>ERASAlberta coverage rate</th>
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<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Number of surgeries performed that were identified as ERAS surgery divided by the total surgeries that were performed that were eligible, multiplied by 100. Calculated provincially, by zone, by site.</td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
<td>Intended to measure the ability of ERASAlberta to provide enhanced recovery surgeries across the province, zone and sites.</td>
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### Outcome Measure #2

<table>
<thead>
<tr>
<th>Name of Measure</th>
<th>ERASAlberta length of stay (LOS) rates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Number of surgeries performed that were identified as ERAS surgery and resulted in</td>
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<tr>
<td></td>
<td>• acute LOS less than or equal to acute LOS benchmark</td>
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<tr>
<td></td>
<td>• ICU LOS less than or equal to ICU LOS benchmark</td>
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<tr>
<td></td>
<td>• readmission LOS less than or equal to readmission LOS benchmark</td>
</tr>
<tr>
<td></td>
<td>• total LOS less than or equal to total LOS benchmark</td>
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<tr>
<td></td>
<td>divided by total surgeries performed that were identified as ERAS surgery, multiplied by 100. Calculated provincially, by zone, by site.</td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
<td>Demonstrates how ERAS impacts patient care by decreasing postoperative complications and accelerating recovery, thereby allowing for earlier discharge.</td>
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### Outcome Measure #3

<table>
<thead>
<tr>
<th>Name of Measure</th>
<th>ERASAlberta readmission rate</th>
</tr>
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<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Number of surgeries performed that were identified as ERAS surgery and resulted in greater than or equal to 1 unplanned readmission to acute care within 30 days of discharge date divided by total surgeries performed that were identified as ERAS surgery, multiplied by 100. Calculated provincially, by zone, by site.</td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
<td>Demonstrates how ERAS impacts patient care by decreasing postoperative complications and accelerating recovery, thereby reducing the risk of readmission.</td>
</tr>
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### Outcome Measure #4

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<thead>
<tr>
<th>Name of Measure</th>
<th>ERASAlberta compliance rates</th>
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<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>Number of surgeries performed that were identified as ERAS surgery in which specific</td>
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<tr>
<td></td>
<td>• ERAS preoperative care</td>
</tr>
<tr>
<td></td>
<td>• ERAS intraoperative care</td>
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<tr>
<td></td>
<td>• ERAS postoperative care</td>
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<tr>
<td></td>
<td>was provided in compliance with ERAS recommendations divided by total surgeries performed that were identified as ERAS surgery, multiplied by 100. Calculated by site.</td>
</tr>
<tr>
<td><strong>Rationale</strong></td>
<td>Compliance with ERAS recommendations is an indicator of the appropriateness of the ERAS clinical care pathway in achieving desired patient outcomes.</td>
</tr>
</tbody>
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References


Additional Information


AHS Basal Bolus Insulin Therapy (BBIT): https://www.albertahealthservices.ca/scns/Page12948.aspx


AHS Knowledge Resource Service ERAS Subject Guide: Surgery Subject Guide:
http://krs.libguides.com/c.php?g=64393&p=414597#s-lg-box-wrapper-15089592

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AHS Venous Thromboembolism Prophylaxis Guideline:

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http://www.bugsanddrugs.org/

Canadian Nutrition Screening Tool (CNST):

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Provincial Clinical Knowledge Topic: Basal Bolus Insulin Therapy, Adult – Inpatient

Safer Healthcare Now! Prevent Surgical Site Infections:

Safer Healthcare Now! Venous Thromboembolism Prevention – Evidence-Based Appropriate VTE Prophylaxis:
Appendix A – Canadian Nutrition Screening Tool (CNST)

Note: Collaboration between patient care units and Nutrition Services is required as interventions may vary at site level.

Figure #2 Canadian Nutrition Screening Tool (CNST)

**Canadian Nutrition Screening Tool (CNST)**

Date: _________
Weight: _________
Patient Phone #: ______
Clinic / Unit: ______

Identify patients who are at risk for malnutrition
Ask the patient the following questions:

Have you lost weight in the past 6 months without trying to lose this weight? (If the patient reports a weight loss but gained it back, consider it as a NO weight loss)
- [ ] YES
- [ ] NO

Have you been eating less than usual for more than a week?
- [ ] YES
- [ ] NO

Two “YES” answers indicate nutrition risk.
Patients at nutrition risk need an assessment to confirm malnutrition. Refer to a Registered Dietitian.

Sign initials once referral sent: ____________________

Comments (optional):

* If the patient is unable to answer the questions, a knowledgeable informant can be used to obtain the information. If the patient is uncertain regarding weight loss, ask if clothing is now fitting more loosely.
Appendix B – AHS ERAS Nutrition Working Group Consensus: Juice as Carbohydrate Loading Products

Background:
Drawing from the best practices around the world, ERAS is being implemented in Alberta to enhance perioperative patient care, support patient recovery and reduce health care costs. Carbohydrate loading is one of seventeen ERAS components and is an integral part of preoperative care process. The main purpose is to attenuate postoperative insulin resistance, which contributes to negative nitrogen balance, leading to muscle mass loss and reduced muscle strength. In addition, carbohydrate loading hinders preoperative stress, hunger and thirst in surgical patients. According to ERAS guidelines, carbohydrate loading involves ingestion of commercially available clear fluid containing 12% concentration of complex carbohydrates. These products have been extensively researched and are recommended for use by ERAS guidelines.

Carbohydrate-rich beverages such as Nutricia PreOp®, Roosvicee Original Fruitmix® and Vitajoule® have been evaluated in clinical trials in an array of surgery patients. ERAS and The European Society of Anaesthesiology Guidelines recommend the ingestion of carbohydrate-rich drinks that were specifically developed for preoperative consumption up to two hours before surgery. No specific guidelines were given regarding the type and/or brand of products to be used, however it was suggested that not all carbohydrates were safe. Gastric emptying is the major concern preoperatively, therefore beverages with lower osmolality assumed to be safer for preoperative consumption. In addition, it was suggested that the insulin response to the beverage should reach 60 μIU/mL to achieve appropriate fed state that is believed to improve postoperative insulin resistance. Most research that has been done involve only commercial products. Clinical studies proposed that 12.5% maltodextrin CHO-rich drink (Nutricia PreOp®) has low osmolarity (290 mOsm/kg) and elicits the required insulin response. Limited number of studies explored the effectiveness of other products such as Vitajoule® (Noblett et al, 2006), Roosvicee fruit syrup and Clearfast®. Nutricia PreOp® has been extensively used for ERAS in Europe and has been validated in several research studies. Clearfast® is similar to Nutricia PreOp® in composition and osmolality. All of these products are yet to become available in Canada, therefore the ERAS Nutrition Working Group proposed the use of commercially available apple juice and cranberry cocktail with the lowest osmolality. The following criteria were used to drive the product selection: availability, palatability, clinical considerations, volume needed, ease and process of administration, cost of product, infection control and simplicity (for patient use and nurses and physicians to discuss with and teach patients). Juices are readily available and palatable, can be easily administered and are low in cost. Although juice utilization has not been validated as an effective preoperative carbohydrate loading option, it was found to be safe for use preoperatively and to date it is the only option available for use in surgery patients in Canada. Consensus on preoperative carbohydrate loading products may be updated once new research and products that meet the criteria are available.

References


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