

MANAGEMENT OF

Low-risk Laparoscopic Cholecystectomy

This care process model (CPM) was developed by **Intermountain Healthcare’s Surgical Services Clinical Program**. It outlines the components of Intermountain Healthcare’s process for low-risk outpatient cholecystectomy. The authors used current trends in the peer-reviewed literature as well as the knowledge and opinion of multiple experts across Intermountain Healthcare to create this CPM.

KEY POINTS

This CPM outlines a multi-disciplinary approach to treatment of patients who have cholelithiasis, biliary dyskinesia, or vague abdominal pain but are otherwise healthy and without comorbid conditions. **This CPM does not focus on diagnostic pathways, indications for the operation, nor how to perform a cholecystectomy.**

► Why Focus ON CHOLECYSTECTOMY

- **It’s common.** Cholecystectomy is a high-volume procedure, accounting for approximately 5,500 operations at Intermountain facilities in 2014 alone.
- **It’s costly.** In 2014, treatment costs for cholecystectomy at Intermountain facilities exceeded \$24 million. Cost variations per case can be reduced by using a standardized approach.
- **Care varies widely.** There is a need to reduce variance in cholecystectomy care delivered in the Intermountain system.

► WHAT’S INSIDE?

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► GOALS

- Improve SDS experience
- Provide clinical continuity
- Improve outcomes
- Mitigate physician litigation risk
- Study problems where limited information is available

Measurement and Evaluation

Intermountain is making a deliberate effort in CPM development to recommend and report on measurable outcomes that can be tied to process variations. These will provide a learning feedback loop by which process variations, outcomes results, and new research findings can be used for continuous improvement of the model. Specific outcome measures in this CPM include **decreasing**:

- Same-day surgery (SDS) length of stay
- Antibiotic use (none, any, pre-op, post-op within 30 days)
- Post-operative emergency room visits
- Post-operative admissions
- Post-operative readmission
- Post-operative narcotic use in SDS
- Cost

 Indicates an Intermountain measure



▶ ALGORITHM: PERIOPERATIVE MANAGEMENT OF LOW-RISK CHOLECYSTECTOMY

Patient and surgeon agree on cholecystectomy

Does patient meet criteria for low-risk laparoscopic cholecystectomy? (a)

yes

no

Patient SCHEDULED for same-day surgery

- (Surgeon / medical assistant) **CHOOSE** *Laparoscopic Cholecystectomy Power Plan* (b)
- **ADMINISTER** pre-operative meds: (c)
 - Pain control
 - Anticoagulation for at-risk patients^{GUY,CAP}
 - Antiemetic

(Antibiotics ARE NOT RECOMMENDED for low-risk laparoscopic cholecystectomy)

PERFORM cholecystectomy (d)

TRANSFER to PACU (c, f)

- **APPLY** CPAP for all patients with a history of OSA or with a STOP-BANG score >3
- **FOLLOW** anesthesia orders for pain management
- **FOLLOW** Modified Aldrete Scoring System for patient management and discharge criteria
- **TRANSFER** to **SDS Phase II recovery** when criteria met.

Does patient meet **Phase II discharge criteria?** (f)

no

yes

Patient remains in hospital until Phase II criteria met

DISCHARGE to home (d)
FOLLOW UP in clinic 1 to 2 weeks after discharge

MODERATE-to-HIGH-RISK cholecystectomy

- (Surgeon) **DETERMINE** care pathway for high-risk patients
- **USE** *Generic Surgery Hospital Power Plan*

ALGORITHM NOTES

(a) Criteria for low-risk laparoscopic cholecystectomy

- Healthy patients **WHO HAVE** biliary dyskinesia or symptomatic cholelithiasis
- Patients who **DO NOT** have cholecystitis, gallstone pancreatitis, complicated gallbladder disease, or possible gallbladder cancer
- Patients who **DO NOT** need to be treated in an inpatient setting or have comorbid conditions

(b) Preoperative procedure (per anesthesia criteria)

- **FOLLOW** NPO guidelines.
- **INSERT** peripheral IV line, and administer IV fluids.
- **OBTAIN** criteria-based diagnostic tests (imaging, labs, EKG).
- **ADMINISTER** medications. (c)

 Indicates an Intermountain measure

ALGORITHM NOTES, CONTINUED

(c) Peri-operative medications

Medication	Dose	Preoperative	Intraoperative	Phase II Recovery	Discharge to home
ONDANSETRON (Zofran)	Intra-operative dose (given by anesthesiologist): <ul style="list-style-type: none"> > 40 kg: 4 mg IV. May give an additional 4mg IV PRN. No single dose to exceed 16 mg/dose IV. May repeat twice, administered 4 and 8 hours after initial dose for postoperative nausea and vomiting (PONV) ≤ 40 kg: 0.1 mg/kg/dose 		√	√	
TRANSDERMAL SCOPALAMINE	1 x 1.5mg extended release transdermal patch.	√			
CONTINUOUS INFUSION	Lactated ringers or 0.9 % NS		√		
ACETAMINOPHEN ¹ (Tylenol)	Administer preoperatively, and then every 4 hours: <ul style="list-style-type: none"> Adult: 10–15 mg/kg/dose every 4 hours Pediatric: 15 mg/kg/dose every 4 hours 	√		√	√
		Wait a minimum of 4 hours between doses.			
IBUPROFEN ¹	<ul style="list-style-type: none"> Adult: 400 mg, 600 mg, or 800 mg PO (tablet) every 8 hours as needed for fever and mild pain < 18 years: 10 mg/kg/dose PO (800 mg maximum dose) 			√	√
HEPARIN ²	Adult only. 5,000 units x 1, preoperative subcutaneous injection if indicated	√			
ENOXAPARIN ²	Adult only. 30 mg x 1, preoperative subcutaneous injection if indicated	√			
OXYCODONE ¹ (Oxycontin, Roxicodone, Oxecta)	Administer preoperatively and then only if pain is not controlled with acetaminophen or ibuprofen: <ul style="list-style-type: none"> Adult: 5 mg or 10 mg PO < 15 years and < 50 kg: 0.1 mg/kg/dose PO < 15 years and ≥ 50 kg: 5 mg oral solution or tablet 	√		√ (only if needed)	√ (only if needed)
		DO NOT GIVE to patients who are ≥ 80 years or those who have obstructive sleep apnea with a score > 5 on the STOP-BANG assessment and are CPAP noncompliant. DO NOT PRESCRIBE more than 10 doses to go home.			
KETEROLAC (Toradol)	Intraoperative dose given by anesthesiologist if surgeon agrees. Adults: 15 mg IV.		√		
		DO NOT GIVE if patient has a history of renal insufficiency, gastrointestinal bleeding, coronary artery disease, or allergy.			
TRAMADOL ^{1,3} (ConZip, Ultram, Ryzolt)	Adult only. 50 mg or 100 mg every 6 hours as needed for mild pain.			√	√
DEXAMETHASONE (Ozurdex, Maxidex, Baycadron)	<ul style="list-style-type: none"> Adult: 8 mg IV Pediatric: 0.5 mg/kg/dose IV 		√		
ANTIBIOTICS	Antibimicrobial prophylaxis is not advised for low-risk gallbladder surgery (cholelithiasis, biliary dyskinesia). ^{BRA}				

1 Time of previous dose to be verified before administering new dose.
 2 Option for high-risk DVT; based on Caprini DVT Risk assessment.^{FAL, CAP, GOU, SPY} (See links on page 4 for more information.)
 3 Option for post-operative pain control.

(d) Intraoperative procedures

NURSE: APPLY sequential compression devices bilaterally to lower extremities prior to induction.

ANESTHESIOLOGIST:

- DO NOT GIVE:
 - Benzodiazepines (except for patients with significant pre-operative anxiety)
 - Long-acting anesthetic agents (e.g., Isoflurane).
- GIVE:
 - Fentanyl (Duragesic). 2 to 3 mcg/kg titrated to patient needs
 - Ketorolac (Toradol): CONSULT with surgeon.
 - Ondansetron (Zofran). ≥ 40 kg: 4 mg IV OR < 40 kg = 0.1 mg/kg/dose
 - Dexamethasone (Decedron). Adult: 8 mg IV; pediatric: 0.5 mg/kg/dose IV
 - Total intravenous anesthesia (TIVA) for patients with history of severe postoperative nausea and vomiting

SURGEON:

- REQUEST tissue pathology and cytology.
- PERFORM imaging with fluoroscopy (Isovue 300 mg), if applicable.
- ADMINISTER pain control. **Local anesthetic** per surgeon:
 - Lidocaine 1 % with epinephrine
 - Bupivacaine 0.25 % with epinephrine
 - Bupivacaine 0.5 % with epinephrine

(e) PACU

- Modified Aldrete Scoring System:
 - Respirations/breath sounds
 - Circulation
 - Color
 - Level of consciousness
 - Activity
 - SPo2/oxygen saturation
 - Pain
 - Nausea/vomiting
- GIVE ice chips; ADVANCE diet as tolerated.
- DISCHARGE to home when phase II criteria met. (f)

(f) SDS phase II recovery criteria

- DISCHARGE if:
 - Vital signs are normal for age
 - Oral fluids are greater than IV maintenance
 - Home medications are well-tolerated (including new pain medication)
 - Pain controlled with oral medication (c)
- PRESCRIBE:
 - Ibuprofen.
 - Acetaminophen (repeat if > 4 hours since preoperative dose).
 - Oxycodone: **Only if ibuprofen and acetaminophen fail.**

REFERENCES

The following references were used in the creation of this CPM:

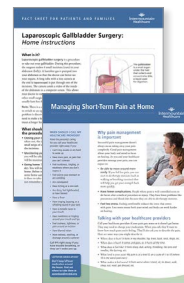
- BRA Bratzler DW, Dellinger EP, Olsen KM, et al. Clinical practice guidelines for antimicrobial prophylaxis in surgery. *Am J Health-Syst Pharm.* 2013;70(3):195-283.
- CAP Caprini JA; Venous Resource Center. Are you at risk for DVT? <http://venousdisease.com/caprini-dvt-risk-assessment/>. Updated 09/09/14. Accessed 12/13/16.
- FAL Falck-Yitter Y, Francis CW, Johanson NA, et al. Executive Summary: Antithrombotic therapy and prevention of thrombosis, 9th Edition: American College of Chest Physicians evidence-based clinical practice guidelines. *Chest.* 2012;141(2Suppl):7s-47s.
- GOU Gould MK, Garcia DA, Wren SM, et al. Prevention of VTE in nonorthopedic surgical patients: Antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians evidence-based clinical practical guidelines. *Chest.* 2012; 141:(2Suppl)e227S-e325S.
- SPY Spyropoulos AC, Douketis JD. How I treat anticoagulated patients undergoing an elective procedure or surgery. *Blood.* 2012;120(15): 2954-2962.

This CPM presents a model of care based on the best available scientific evidence at the time of publication. It is not a prescription for every physician or every patient, nor does it replace clinical judgment. All statements, protocols, and recommendations herein are viewed as transitory and iterative. Although physicians are encouraged to follow the CPM to help focus on and measure quality, deviations are a means for discovering improvements in patient care and expanding the knowledge base. Send feedback to David E. Skarda, MD, Medical Director, Surgical Services Clinical Program, Intermountain Healthcare. David.Skarda@imail2.org.

PATIENT AND PROVIDER RESOURCES

Intermountain patient resources

Clinicians can order Intermountain patient education booklets and fact sheets for distribution to their patients from Intermountain's iprintstore.org.



Fact sheets:

- [Laparoscopic Gallbladder Surgery: Home Instructions](#) (also available in Spanish)
- [Managing Short-Term Pain at Home](#) (also available in Spanish)

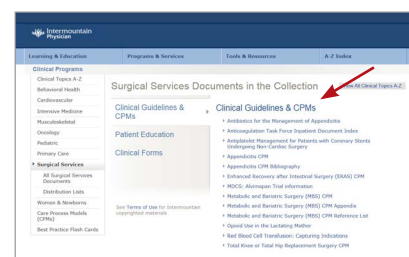
Provider resources

To find this CPM and its reference list, clinicians can go to intermountainphysician.org/. Click on A-Z Index → Clinical Programs → Surgical Services → CPMs and Guidelines, and look for the topic list on the right.

Additional links

[Modified Caprini risk assessment model for VTE in general surgical patients](#)

[Procedural bleeding risk](#)



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