Cholecystectomy by Laparoscopy

ORG: S-365 (ISC)
Link to Codes

MCG Health
Inpatient & Surgical Care
23rd Edition

Care Planning - Inpatient Admission and Alternatives

Clinical Indications for Procedure

- Procedure is indicated for **1 or more** of the following(1)(2)(3)(4)(5)(6):
  - Symptomatic gallstone disease as indicated by **ALL** of the following(10):
    - Evidence of gallstone disease as indicated by **1 or more** of the following:
      - Stones demonstrated on cholecystography, ultrasound, CT, or MRI
      - Nonvisualizing gallbladder with double-dose cholecystography or HIDA scan
    - Symptoms of gallstone disease indicated by **1 or more** of the following:
      - Biliary colic
      - Acute cholecystitis as indicated by **ALL** of the following[A](11):
        - Right upper quadrant pain, mass, or tenderness
        - Systemic signs of inflammation as indicated by **1 or more** of the following:
          - Fever
          - C-reactive protein level greater than 10 mg/L
          - White blood cell count greater than 10,000/mm^3 (10 x10^9/L) or less than 4000/mm^3 (4 x10^9/L)
      - Acute pancreatitis not associated with alcohol excess(12)(13)
  - Asymptomatic gallstone disease in patient at high risk for cancer (eg, calcified gallbladder wall, gallbladder polyp greater than 1 cm or rapidly growing, choledochal cyst, anomalous pancreaticobiliary junction)(14)(15)
  - Asymptomatic gallstone disease in patient at high risk for acute cholecystitis or other biliary tract complications (eg, pretransplant, chronic hemolytic syndromes)(15)(16)(17)
  - Other symptomatic biliary disease as indicated by **1 or more** of the following:
    - Acalculous cholecystitis(18)(19)
    - Biliary dyskinesia with abnormal ejection fraction (less than 35%) on hepatobiliary scan(20)(21)(22)(23)
  - Prophylactic cholecystectomy for remaining gallbladder after stone clearance (eg, endoscopic sphincterotomy and common bile duct clearance)
  - As part of combined procedure to relieve small bowel obstruction due to gallstone ileus

Alternatives to Procedure

- Alternatives include(1)(2)(4)(5)(6):
  - Open cholecystectomy. See Cholecystectomy ISC guideline.
  - Percutaneous gallbladder drainage(27)(28)

- Extracorporeal shock wave lithotripsy[B](3)(29)(30)
- Medical dissolution(3)(31)

Operative Status Criteria

- Ambulatory(32)(33)(34)

Preoperative Care Planning

- Preoperative care planning needs may include(1)(2)(5)(6):
  - Routine preoperative evaluation. See Preoperative Education, Assessment, and Planning Tool SR.
  - Diagnostic test scheduling, including:
    - Abdominal ultrasound
    - Abdominal CT scan
    - HIDA scan
    - Magnetic resonance cholangiopancreatography
  - Preoperative discharge planning as appropriate. See Discharge Planning in this guideline.

Hospitalization

Optimal Recovery Course

Day	Level of Care	Clinical Status	Activity	Routes	Interventions	Medications
1	• Early AM OR to recovery to discharge[C] • Readmission Risk Assessment • Discharge planning	• **Successful uncomplicated cholecystectomy** • **Nausea and pain absent or managed postoperatively** • **No evidence of infection** • **Discharge plans and education understood**	• **Ambulatory postoperatively[D]**	• IV fluids, medications for procedure • **Oral hydration, oral medications, clear liquid diet to advanced diet postoperatively**	• Possible postoperative CBC	• Possible antiemetic regimen • Possible analgesics

(1)(5)(32)(33)(34)N

Recovery Milestones are indicated in **bold**.

Goal Length of Stay: Ambulatory

Note: Goal Length of Stay assumes optimal recovery, decision making, and care. Patients may be discharged to a lower level of care (either later than or sooner than the goal) when it is appropriate for their clinical status and care needs.

Extended Stay

Minimal (a few hours to 1 day), Brief (1 to 3 days), Moderate (4 to 7 days), and Prolonged (more than 7 days).

- Inpatient stay may be needed for(35)(36)(37):
  - Failure to achieve discharge status criteria. See Ambulatory Surgery Discharge and Complications: Common Complications and Conditions ISC guideline.
  - Conversion to open procedure(38)(39)(40)(41)
  - Systemic infection (eg, bacteremia, Hemodynamic instability)
    - Anticipate hemodynamic support, antibiotics, and ongoing monitoring.
    - Expect brief stay extension.
  - Care for active comorbidities(13)(42)(43)(44)(45)
    - Patient with complex conditions such as pancreatitis, heart failure, or renal failure may require continued inpatient care.
    - Expect brief stay extension.
  - Complications of procedure(46)(47)(48)
    - Complications include bile duct injury and intraoperative or postoperative bleeding.
    - Expect brief to moderate stay extension.

See Common Complications and Conditions ISC for further information.

Hospital Care Planning

- Hospital evaluation and care needs may include(1)(2)(5)(6):
  - Treatment and procedure scheduling and completion, including:
    - Antibiotics
    - Antiemetics and dexamethasone(54)
  - Consultation, assessment, and other services scheduling and completion, including:
    - Dietitian for education in low-fat diet
  - Identification of patient at high risk for readmission to prioritize transition and post-acute care; readmission risk factors include:
    - Risk of readmission is increased by presence of **1 or more** of the following(7)(53)(55)(56)(57)(58)(59)(60):
      - Hospitalization (nonelective) in past 6 months(61)(62)(63)(64)
      - 2 or more emergency department visits in past 6 months
      - No source of outpatient care other than emergency department (eg, no primary care provider)(64)(65)
      - Severe care transition barriers (eg, no caregiver, homeless)(61)(63)(66)
      - American Society of Anesthesiologists class higher than II (ie, III through V)
      - Severe or end-stage renal disease (on dialysis or GFR less than 30 mL/min/1.73m^2 (0.5 mL/sec/1.73m^2))(61)(67)
        eGFR - Adult Calculator eGFR - Pediatric Calculator
      - AIDS (not just HIV positive)
      - Metastatic solid tumor (eg, lung cancer, breast cancer)
      - Advanced liver disease (eg, cirrhosis with portal hypertension, history of variceal bleed)
  - Monitoring patient's status for deterioration and comorbid conditions (see Inpatient Monitoring and Assessment Tool SR); key items include(68):
    - Gastrointestinal status, including nausea or vomiting
    - Pain management(51)
    - Identification of bile duct injuries

Discharge

Discharge Planning

- Discharge planning includes[E]:
  - Assessment of needs and planning for care, including:
    - Develop treatment plan (involving multiple providers as needed).
    - Evaluate and address preadmission functioning as needed.
    - Evaluate and address patient or caregiver preferences as indicated.
    - Identify skilled services needed at next level of care, with specific attention to:
      - Gastrointestinal status assessment(70)
      - Pain management(71)
    - Evaluate and address psychosocial status issues as indicated. See Psychosocial Assessment SR for further information.
  - Early identification of anticipated discharge destination; options include:
    - Home, considerations include:
      - Access to follow-up care
      - Home safety assessment. See Home Safety Assessment SR for further information.
      - Self-management ability if appropriate. See Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) Assessment SR for further information.
      - Caregiver need, ability, and availability
    - Post-acute skilled care or custodial care as indicated. See Discharge Planning Tool SR for further information.
  - Transition of care plan complete
    - Patient, family, and caregiver education complete. See Cholecystectomy by Laparoscopy: Patient Education for Clinicians SR for further information.
      - See Teach Back Tool SR for further information.
    - Medication reconciliation completion includes(72):
      - Compare patient's discharge list of medications (prescribed and over-the-counter) against provider's admission or transfer orders.
      - Assess each medication for correlation to disease state or medical condition.
      - Report medication discrepancies to prescribing provider, attending physician, and primary care provider, and ensure accurate medication order is identified.
      - Provide reconciled medication list to all treating providers.
      - Confirm that patient, family, or caregiver can acquire medication.
      - Educate patient, family, and caregiver.
        - Provide complete medication list to patient, family, and caregiver.
        - Importance of presenting personal medication list to all providers at each care transition, including all provider appointments
        - Reason, dosage, and timing of medication (eg, use "teach-back" techniques)(73)

    - Encourage communication between patient, family, caregiver, and pharmacy for obtaining prescriptions, setting up home medication delivery, and reviewing for drug-drug interactions.(74)
    - See Medication Reconciliation Tool SR for further information.
  - Plan communicated to patient, family, caregiver, and all members of care team, including(75):
    - Inpatient care and service providers
    - Primary care provider
    - All post-discharge care and service providers
  - Appointments planned or scheduled, which may include:
    - Primary care provider(76)
    - Dietitian(77)
    - General surgeon(70)
    - Other
  - Outpatient testing and procedure plans made, which may include:
    - Other
  - Referrals made for assistance or support, which may include:
    - Financial, for follow-up care, medication, and transportation
    - Smoking cessation counseling or treatment
    - Substance use counseling or rehabilitation
    - Other
  - Medical equipment and supplies coordinated (ie, delivered or delivery confirmed), which may include:
    - Other

Discharge Destination

- Post-hospital levels of admission may include:
  - Home.
  - Home healthcare. See Home Care Indications for Admission Section HC in Cholecystectomy by Laparoscopy guideline in Home Care.
  - Recovery facility care. See Recovery Facility Care Indications for Admission Section RFC in Cholecystectomy guideline in Recovery Facility Care.

Evidence Summary

Criteria

An analysis of over 65,500 cholecystectomies performed in adults over a 4-year period at over 220 North American hospitals found that 89% of procedures were performed laparoscopically.(4) **(EG 2)** Analysis of a database including 20,307 adult patients who underwent cholecystectomy found that 91% were performed laparoscopically.(7) **(EG 2)** A systematic review and meta-analysis of 38 randomized controlled trials (2338 patients) that compared open and laparoscopic cholecystectomy found that the laparoscopic approach reduced convalescent time and length of stay.(8) **(EG 1)** A systematic review and meta-analyses of 5 randomized controlled studies (284 adult patients) comparing laparoscopic to open cholecystectomy in cirrhotic patients found that the laparoscopic approach reduced surgery-related morbidity, complications, and length of stay.(9) **(EG 1)**

Alternatives

Open cholecystectomy may be indicated for patients with poor pulmonary or cardiac reserve, suspected or known gallbladder cancer, third-trimester pregnancy, or as part of a combined intra-abdominal procedure.(1)(2)(24) **(EG 2)** High-risk patients, including the elderly, the critically ill, and those with Child-Turcotte-Pugh class C cirrhosis, may require cholecystotomy (percutaneous drainage) instead of, or before, cholecystectomy; however, multivariate adjusted analysis of large databases have found that cholecystotomy rather than cholecystectomy was independently associated with a higher risk of death.(25)(26) **(EG 2)**

Hospitalization

Database analysis of 4011 patients age 65 and older, with and without significant comorbidities, comparing early (less than 24 hours after admission) and delayed (greater than 24 hours after admission) laparoscopic cholecystectomy for acute cholecystitis found, after multivariate adjustment, that early surgical intervention was independently associated with a reduced postoperative length of stay irrespective of the presence of significant comorbidities, without any noted increase in adverse events.(49) **(EG 2)** A systematic review and meta-analysis of 16 randomized controlled trials (2398 adult patients) comparing routine use of a drain to no drain after laparoscopic cholecystectomy found that the no-drain group had less pain 24 hours after surgery, with no significant difference between the groups with regard to all other measured clinical outcomes.(50) **(EG 1)** A systematic review that identified 68 randomized controlled trials examining interventions to facilitate ambulatory laparoscopic cholecystectomy found that the following interventions were beneficial: preoperative IV dexamethasone to reduce postoperative nausea and vomiting, preoperative administration of NSAIDs, local anesthesia to wounds and peritoneum, and intraoperative administration of an antiemetic (eg, ondansetron).(51) **(EG 1)** A randomized controlled trial of 414 adults with mild to moderate acute calculous cholecystitis who underwent cholecystectomy (85% laparoscopic) found that compared with placebo, administration of postoperative antibiotics did not reduce the postoperative infection rate.(52) **(EG 1)**

Readmission risk and reduction: Analysis of over 20,000 adults who underwent cholecystectomy (laparoscopic and open) found, after multivariate adjustment, that American Society of Anesthesiology class higher than II (ie, III through V) was an independent predictor of all-cause 30-day readmission.(7) **(EG 2)** Analysis of 5046 pediatric patients who underwent laparoscopic cholecystectomy found, after multivariate adjustment, that American Society of Anesthesiology class III or higher was an independent predictor of 30-day readmission.(53) **(EG 2)**

Length of Stay

A report on a cohort of 1000 adults who underwent single-port laparoscopic cholecystectomy through the umbilicus stated that the mean length of stay was 16 hours, with 97% of patients being discharged within 24 hours.(32) **(EG 2)** A study of 191 pediatric patients who underwent laparoscopic cholecystectomy found a mean length of stay of 15 hours.(33) **(EG 2)** Analysis of procedure data for a large commercially insured pediatric population shows 87% of laparoscopic cholecystectomy procedures being performed on an outpatient basis.(34) **(EG 3)** Analysis of procedure data for a large commercially insured adult population shows 83% of laparoscopic cholecystectomy procedures being performed on an outpatient basis.(34) **(EG 3)** Analysis of procedure data for a Medicare-insured population shows 60% of laparoscopic cholecystectomy procedures being performed on an outpatient basis.(34) **(EG 3)**

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Footnotes

[A] An imaging study consistent with acute cholecystitis can further confirm the diagnosis but may not be evident in all cases.(11) [A in Context Link 1]

[B] Extracorporeal shock wave lithotripsy (ESWL) of the gallbladder is usually combined with medical dissolution therapy. The use of ESWL should be limited to symptomatic patients who refuse or at high risk for surgery, have a single radiolucent pure cholesterol stone less than 20 mm in diameter, and have a functioning gallbladder with a patent cystic duct.(3)(29)(30) [B in Context Link 1]

[C] See Ambulatory Surgery Discharge and Complications: Common Complications and Conditions ISC for further information. [C in Context Link 1]

[D] Patient is ambulatory or near baseline activity for age and development. [D in Context Link 1]

[E] Discharge instructions should be given in the patient's and caregiver's native language using trained language interpreters whenever possible.(69) [E in Context Link 1]

Definitions

Altered mental status that is severe or persistent

- Altered mental status (ie, different from baseline) that is severe or persistent as indicated by **1 or more** of the following(1)(2)(3)(4):
  - Confusional state (eg, disorientation, difficulty following commands, deficit in attention) that persists (eg, for more than few hours) despite appropriate treatment (eg, of underlying cause)
  - Lethargy (awake or arousable, but with drowsiness; reduced awareness of self and environment) that persists (eg, for more than few hours) despite appropriate treatment (eg, of underlying cause)
  - Obtundation (ie, arousable only with strong stimuli, lessened interest in environment, slowed responses to stimulation)
  - Stupor (may be arousable but patient does not return to normal baseline level of awareness)
  - Coma (not arousable)

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Fever

- Fever indicated by **1 or more** of the following(1)(2)(3):
  - Core (eg, rectal)[A] temperature greater than or equal to 100 degrees F (37.8 degrees C) in adult
  - Core (eg, rectal)[A] temperature greater than or equal to 100.4 degrees F (38 degrees C) in child
  - Oral temperature[B] greater than or equal to 99.3 degrees F (37.4 degrees C) in adult
  - Oral temperature[B] greater than or equal to 99.7 degrees F (37.6 degrees C) in child
  - Unadjusted tympanic membrane temperature[C] greater than or equal to 98.6 degrees F (37 degrees C) in adult
  - Unadjusted tympanic membrane temperature[C] greater than or equal to 99 degrees F (37.2 degrees C) in child

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Footnotes

A. When feasible and when precise temperature measurement is clinically necessary, rectal temperature readings are the most reliable.(1)(2)(3)
B. Oral temperature readings are generally 0.7 degrees F (0.4 degrees C) lower than rectal readings.(3)

C. Unadjusted tympanic membrane temperature readings are generally 1.6 degrees F (0.8 degrees C) lower than rectal readings.(3) Some tympanic membrane thermometers are set to automatically correct for this difference and display a calculated core temperature equivalent.(3)

Hemodynamic instability

- Hemodynamic instability as indicated by **1 or more** of the following(1)(2)(3)(4)(5)(6)(7):
  - Vital sign abnormality not readily corrected by appropriate treatment within 12 to 24 hours as indicated by **1 or more** of the following:
    - Tachycardia that persists despite appropriate treatment (eg, volume repletion, treatment of pain, treatment of underlying cause)
    - Hypotension that persists despite appropriate treatment (eg, volume repletion, treatment of underlying cause)
    - Orthostatic vital sign changes that persist despite appropriate treatment (eg, volume repletion)
  - Vital sign abnormality that is severe as indicated by **1 or more** of the following:
    - Vital sign abnormality (eg, Hypotension) leading to inadequate systemic perfusion as indicated by **1 or more** of the following:
      - Lactate of 22.5 mg/dL (2.5 mmol/L) or more[A](8)(9)
      - Metabolic acidosis (arterial pH less than 7.35) not otherwise explained
      - New abnormal capillary refill (greater than 3 seconds)
      - Reduced urine output
      - Altered mental status that is severe or persistent
      - Myocardial ischemia
    - Mean arterial pressure[B] less than 60 mm Hg
    - IV inotropic or vasopressor medication required to maintain adequate blood pressure or perfusion

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Footnotes

A. There are numerous causes of an elevated lactate level. The most common are cardiogenic or hypovolemic shock, severe heart failure, severe trauma, or sepsis. However, there are also other etiologies to consider such as vigorous exercise, seizures, liver disease, or medication use (eg, metformin, beta2-agonists); therefore, interpretation of elevated lactate levels requires consideration of the clinical context (eg, well appearing post exercise vs hypotensive). The severity and persistence of the elevation can sometimes be helpful in this differentiation. In most instances of lactic acidosis, blood pH is less than 7.35, with a serum bicarbonate level 20 mEq/L (mmol/L) or lower. However, a coexisting respiratory or metabolic alkalosis can mask these findings.(8)(9)

B. The mean arterial pressure takes into account both systolic and diastolic blood pressure readings and is calculated as mean arterial pressure (MAP) equals 1/3 SBP + 2/3 DBP.(1)(6)

Hypotension

- Hypotension as indicated by **ALL** of the following(1)(2)(3)(4):
  - Not patient baseline (eg, healthy adult with low SBP) or intentional therapeutic goal (eg, low SBP as treatment goal in heart failure)
  - Low blood pressure as indicated by **1 or more** of the following:
    - SBP less than 90 mm Hg in adult or child 10 years or older
    - Decrease in baseline SBP greater than 40 mm Hg in adult or child 10 years or older
    - Mean arterial pressure[A] less than 70 mm Hg in adult or child 10 years or older
    - Decrease in baseline mean arterial pressure[A] by 25% or more

- SBP less than sum of 70 mm Hg plus twice patient's age in years in child 1 to 9 years of age
- SBP less than 70 mm Hg in infant 1 to 11 months of age

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Footnotes

A. The mean arterial pressure takes into account both systolic and diastolic blood pressure readings and is calculated as Mean Arterial Pressure (MAP) = 1/3 SBP + 2/3 DBP.

Orthostatic vital sign changes

- Orthostatic vital sign changes as indicated by **1 or more** of the following(1)(2):
  - Fall in SBP of 20 mm Hg or more 1 to 3 minutes after patient sits or stands from recumbent position
  - Fall in DBP of 10 mm Hg or more 1 to 3 minutes after patient sits or stands from recumbent position

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Readmission Risk Assessment

- Risk of readmission is increased by presence of **1 or more** of the following(1)(2)(3)(4)(5)(6)(7)(8):
  - Hospitalization (nonelective) in past 6 months(9)(10)(11)(12)
  - 2 or more emergency department visits in past 6 months
  - No source of outpatient care other than emergency department (eg, no primary care provider)(12)(13)
  - Severe care transition barriers (eg, no caregiver, homeless)(9)(11)(14)
  - American Society of Anesthesiologists class higher than II (ie, III through V)
  - Severe or end-stage renal disease (on dialysis or GFR less than 30 mL/min/1.73m^2 (0.5 mL/sec/1.73m^2))(9)(15)
    eGFR - Adult Calculator eGFR - Pediatric Calculator
  - AIDS (not just HIV positive)
  - Metastatic solid tumor (eg, lung cancer, breast cancer)
  - Advanced liver disease (eg, cirrhosis with portal hypertension, history of variceal bleed)

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Reduced urine output

- Reduced urine output as indicated by **1 or more** of the following(1)(2):
  - Urine output less than 0.5 mL/kg/hour for 6 hours in adult
  - Anuria (urine output less than 0.1 mL/kg/hour) for 4 hours in any age group
  - Reduced output in child as indicated by **1 or more** of the following(3):
    - Urine output less than 2 mL/kg/hour for 6 hours in infant younger than 2 years
    - Urine output less than 1 mL/kg/hour for 6 hours in child younger than 12 years
    - Urine output less than 0.75 mL/kg/hour for 6 hours in adolescent younger than 18 years

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Tachycardia

- Tachycardia as indicated by **1 or more** of the following(1)(2):
  - Heart rate greater than 100 beats per minute in adult or child age 6 years or older
  - Heart rate greater than 115 beats per minute in child 3 to 5 years of age
  - Heart rate greater than 125 beats per minute in child 1 or 2 years of age
  - Heart rate greater than 130 beats per minute in infant 6 to 11 months of age
  - Heart rate greater than 150 beats per minute in infant 3 to 5 months of age
  - Heart rate greater than 160 beats per minute in infant 1 or 2 months of age

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Codes

ICD-10 Diagnosis: K56.3, K80.00, K80.01, K80.10, K80.11, K80.12, K80.13, K80.18, K80.19, K80.20, K80.21, K80.30, K80.31, K80.32, K80.33, K80.34, K80.35, K80.36, K80.37, K80.60, K80.61, K80.62, K80.63, K80.64, K80.65, K80.66, K80.67, K80.70, K80.71, K80.80, K81.0, K81.1, K81.2, K81.9, K82.0, K82.1, K82.2, K82.3, K82.4, K82.8, K82.9, K82.A1, K82.A2, K83.01, K83.09, K83.5, K83.8, K87, S36.122A, S36.122D, S36.122S, S36.123A, S36.123D, S36.123S, S36.128A, S36.128D, S36.128S [Hide]

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