Gallbladder Disease Management Guideline

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Introduction

Gallbladder diseases encompass a range of conditions, including symptomatic cholelithiasis, acute calculus cholecystitis (ACC), acute acalculous cholecystitis, and choledocholithiasis. These conditions are frequently encountered in Acute Care Surgery and necessitate an evidence-based approach for effective management. The purpose of this guideline is to standardize the evaluation and treatment of these gallbladder disorders based on the best available evidence.

Background

Gallstones, or cholelithiasis, affect approximately 10–15% of the general population. The prevalence varies across regions, with some countries experiencing higher rates. Complications related to gallstones occur in 20–40% of affected individuals, with an annual incidence of 1–3%. Among these complications, acute calculus cholecystitis represents the initial clinical presentation in 10–15% of cases (Schuster et al., 2019).

Guideline Development

This guideline integrates recommendations from the American Association for the Surgery of Trauma (AAST) and aligns with the World Society of Emergency Surgery (WSES) 2020 guidelines. These recommendations are based on comprehensive reviews of current literature and expert consensus (Pisano et al., 2020).

Recommendations

Recommendation 1: Diagnostic Approach to Acute Calculus Cholecystitis (ACC)

- **Key Points**: Diagnosing ACC should not depend solely on a single clinical or laboratory finding. Due to the variability in presentation, a combination of clinical symptoms, imaging studies, and laboratory tests is necessary for accurate diagnosis. Reliance on multiple diagnostic modalities increases the likelihood of identifying ACC accurately, as no single test is sufficiently definitive. Comprehensive assessment improves diagnostic precision and helps avoid misdiagnosis.
- **Supporting Evidence**: High-quality evidence from systematic reviews and prospective studies supports the necessity of a multifaceted diagnostic approach (Trowbridge et al., 2003; Eskelinen et al., 2004).
- **Strength**: Strong

Recommendation 2: Initial Imaging for Suspected ACC

- **Key Points**: Abdominal ultrasound (US) is recommended as the initial imaging modality for suspected ACC. US is preferred due to its cost-effectiveness, broad availability, non-invasive nature, and high diagnostic accuracy for detecting gallstones and inflammation. It provides real-time imaging and helps guide subsequent management decisions. US is also less likely to expose patients to radiation, making it safer compared to other imaging techniques.
- **Supporting Evidence**: High-quality evidence from systematic reviews and observational studies supports US as the primary imaging tool. Studies highlight its effectiveness in identifying gallstones and signs of cholecystitis (Kiewec et al., 2012; Gorodner et al., 2014).
- **Strength**: Strong

Recommendation 3: Role of Alternative Imaging Techniques

- **Key Points**: While US is the initial imaging choice, additional imaging techniques may be warranted based on the patient's condition and the availability of resources. Hepatobiliary iminodiacetic acid (HIDA) scan is recommended for its high sensitivity and specificity in diagnosing ACC. Computed tomography (CT) has lower diagnostic accuracy for ACC, and magnetic resonance imaging (MRI) provides comparable results to US but is less commonly used due to cost and availability. Further imaging should be guided by local expertise and patient-specific factors.
- **Supporting Evidence**: Moderate-quality evidence indicates that HIDA scan is superior to other modalities for diagnosing ACC. CT is less reliable, and MRI offers similar diagnostic value to US (Changphaisarnkul et al., 2015; Fagenzholz et al., 2015; Kim et al., 2015).
- **Strength**: Moderate

Recommendation 4: Liver Function Tests (LFTs) and Bilirubin in Diagnosing Common Bile Duct Stones (CBDS)

- **Key Points**: Elevated liver biochemical enzymes or bilirubin levels are insufficient as standalone indicators of CBDS in ACC patients. While abnormal liver function tests can suggest the presence of CBDS, they are not definitive. Additional diagnostic procedures are necessary to accurately identify CBDS and determine the appropriate management strategy. Over-reliance on LFTs and bilirubin can lead to false negatives or missed diagnoses.
- **Supporting Evidence**: Moderate-quality evidence from cohort and observational studies indicates that elevated LFTs and bilirubin alone are not reliable for diagnosing CBDS. Further diagnostic testing is recommended (Peng et al., 2005; Barkun et al., 1994; Onken et al., 1996).
- **Strength**: Moderate

Recommendation 5: Imaging Features as Predictors of CBDS

- **Key Points**: An increased common bile duct (CBD) diameter is an indirect sign that may suggest the presence of CBDS, but it is not a definitive diagnostic tool. The presence of an enlarged CBD alone cannot confirm CBDS and should not be used as the sole criterion for diagnosis. Comprehensive evaluation including additional imaging and diagnostic tests is necessary for accurate diagnosis and treatment planning.
- **Supporting Evidence**: High-quality evidence from meta-analyses and retrospective studies supports the need for further diagnostic testing beyond CBD diameter measurements to accurately identify CBDS (Gurusamy et al., 2015; Boys et al., 2014).
- **Strength**: Strong

Recommendation 6: Management of ACC with Moderate Risk for CBDS

- **Key Points**: For patients with ACC who are at moderate risk for CBDS, preoperative evaluation using MRCP, EUS, IOC, or LUS is recommended. These imaging techniques help in assessing the presence of CBDS and guiding surgical or non-surgical interventions. The choice of imaging modality should be based on local resources, expertise, and patient-specific factors. Each technique has its own advantages and limitations, and the decision should be individualized.
- **Supporting Evidence**: High-quality evidence from meta-analyses and guidelines indicates that these imaging modalities offer high diagnostic accuracy for CBDS, with MRCP and EUS being particularly effective (Giljaca et al., 2015; Maple et al., 2010; Giannini et al., 2020).
- **Strength**: Strong

Recommendation 7: Management of ACC with High Risk for CBDS

- **Key Points**: In high-risk patients for CBDS, preoperative ERCP, IOC, or LUS should be performed based on local expertise and availability. These procedures help to identify and manage CBDS before or during surgery. ERCP is particularly useful for direct removal of CBDS, while IOC and LUS provide valuable intraoperative information. The choice of procedure should align with the patient's risk profile and available resources.
- **Supporting Evidence**: High-quality evidence from meta-analyses supports the use of ERCP, IOC, or LUS in high-risk patients, showing no significant difference in effectiveness among these techniques (Aziz et al., 2014; Dasari et al., 2013; Choi et al., 2018).
- **Strength**: Strong

Recommendation 8: Treatment of CBDS in ACC Patients

- **Key Points**: CBDS should be managed through preoperative, intraoperative, or postoperative removal depending on the available techniques and expertise. Preoperative removal can be achieved through ERCP, while intraoperative removal can be performed during cholecystectomy. Postoperative management may include

ERCP if CBDS are discovered after initial surgery. The method of removal should be chosen based on patient factors and local practices.

- **Supporting Evidence**: High-quality evidence from systematic reviews and meta-analyses supports the effectiveness of CBDS removal through various approaches (Dasari et al., 2013; Wang et al., 2013).
- **Strength**: Strong

Recommendation 9: First-Line Treatment for ACC

- **Key Points**: Laparoscopic cholecystectomy is the recommended first-line treatment for ACC due to its minimally invasive nature, reduced recovery time, and overall effectiveness in resolving symptoms. It is preferred over open cholecystectomy for most patients unless contraindications are present. The decision for laparoscopic versus open surgery should be based on the patient's clinical condition and surgical expertise available.
- **Supporting Evidence**: High-quality evidence from systematic reviews and meta-analyses supports laparoscopic cholecystectomy as the preferred treatment option (Coccolini et al., 2015; Song et al., 2016; Bansal et al., 2017).
- **Strength**: Strong

Recommendation 10: Contraindications to Laparoscopic Cholecystectomy

- **Key Points**: Laparoscopic cholecystectomy should be avoided in patients experiencing septic shock or those with absolute contraindications to anesthesia. These conditions pose significant risks that can outweigh the benefits of laparoscopic surgery. In such cases, alternative management strategies should be considered to address the patient's underlying conditions while managing the gallbladder disease.
- **Supporting Evidence**: The recommendation is based on expert consensus and review studies that highlight the risks associated with performing laparoscopic surgery under these conditions (Miller et al., 2018).
- **Strength**: Strong

Recommendation 11: Laparoscopic Cholecystectomy in Special Populations

- **Key Points**: Laparoscopic cholecystectomy should be considered for ACC patients with Child A and B cirrhosis, advanced age (including those over 80 years), and pregnant patients, particularly in the second trimester. The decision should be tailored to the patient's specific circumstances, balancing the risks and benefits. Special considerations for cirrhosis, advanced age, and pregnancy include managing potential complications and ensuring the safety of both the patient and the fetus.
- **Supporting Evidence**: Variable-quality evidence suggests that laparoscopic cholecystectomy can be performed safely in these special populations, with careful planning and management (Pisano et al., 2019; Sedaghat et al., 2017; Loozen et al., 2017).
- **Strength**: Weak

Recommendation 12: Surgical Strategies in Difficult Cases

- **Key Points**: In cases where anatomical identification is challenging, such as severe inflammation or dense adhesions, laparoscopic or open subtotal cholecystectomy may be necessary. These approaches can help reduce the risk of complications and ensure that the surgery is performed safely. The choice between laparoscopic and open subtotal cholecystectomy should be guided by the extent of inflammation, the patient's overall condition, and the surgeon's expertise.
- **Supporting Evidence**: Moderate-quality evidence from systematic reviews supports the use of these strategies in difficult cases, highlighting their effectiveness in managing complex situations (Elsherbiny et al., 2015).
- **Strength**: Strong

Recommendation 13: Conversion from Laparoscopic to Open Cholecystectomy

- **Key Points**: Conversion from laparoscopic to open cholecystectomy should be considered when faced with severe inflammation, extensive adhesions, significant bleeding, or suspected bile duct injury. Conversion may be necessary to manage complications effectively and ensure patient safety. The decision should be based on intraoperative findings and the surgeon's assessment of risk.
- **Supporting Evidence**: Moderate-quality evidence from retrospective studies indicates that conversion to open surgery may be required in complex cases to mitigate risks and manage complications (Morrow et al., 2019; Noll et al., 2020).
- **Strength**: Moderate

Recommendation 14: Timing for Laparoscopic Cholecystectomy

- **Key Points**: Laparoscopic cholecystectomy should be performed within 7 days of hospital admission and 10 days of symptom onset. Early surgery is associated with better outcomes and reduced risk of complications. Delayed surgery may increase the risk of recurrent symptoms or progression of the disease.
- **Supporting Evidence**: Moderate-quality evidence from meta-analyses supports the benefits of early cholecystectomy, including improved outcomes and reduced risk of complications (Gurusamy et al., 2013).
- **Strength**: Strong

Recommendation 15: Non-Operative Management (NOM) for ACC

- **Key Points**: Non-operative management, including medical therapy and antibiotics, should be considered for patients who refuse surgery or are not suitable candidates. NOM can provide symptomatic relief and control infection in certain cases. However, it is generally considered a temporary measure, with surgery often recommended once the patient is stable and operable.
- **Supporting Evidence**: Weak evidence from small randomized controlled trials (RCTs) and observational studies suggests that NOM can be effective in selected cases, but it may not address the underlying cause of ACC (Brazzelli et al., 2015; Liao et al., 2016).
- **Strength**: Weak

Recommendation 16: Treatment for High-Risk ACC Patients

- **Key Points**: For high-risk patients with ACC (e.g., those with an Apache score of 7-14), laparoscopic cholecystectomy is preferred over percutaneous gallbladder drainage (PTGBD) due to its long-term benefits and reduced risk of complications. PTGBD may be used as a temporary measure in patients who are not immediately suitable for surgery. Laparoscopic cholecystectomy offers definitive treatment and is associated with lower rates of recurrent symptoms.
- **Supporting Evidence**: High-quality evidence from systematic reviews and RCTs supports the use of laparoscopic cholecystectomy for high-risk patients, with PTGBD as an alternative in specific scenarios (Ambe et al., 2016; Loozen et al., 2018).
- **Strength**: Strong

Recommendation 17: Gallbladder Drainage for Non-Surgical Candidates

- **Key Points**: Gallbladder drainage is recommended for patients with septic ACC who are not candidates for surgery. It can convert a septic patient to a non-septic state, improving overall management and potentially paving the way for future surgical interventions. This approach helps control infection and stabilize the patient.
- **Supporting Evidence**: Moderate-quality evidence from RCTs and systematic reviews supports gallbladder drainage as a viable option for non-surgical candidates, providing symptom relief and infection control (Winbladh et al., 2009; Campanile et al., 2014).
- **Strength**: Moderate

Recommendation 18: Antibiotic Use in Uncomplicated ACC

- **Key Points**: Routine postoperative antibiotics are not recommended in uncomplicated ACC cases if the infection focus is controlled by cholecystectomy. Overuse of antibiotics can contribute to resistance and other complications. The use of antibiotics should be reserved for cases where there is clear evidence of ongoing infection or risk of postoperative infection.
- **Supporting Evidence**: High-quality evidence from RCTs indicates that postoperative antibiotics are unnecessary if the infection focus is adequately managed through surgical intervention (Regimbeau et al., 2014).
- **Strength**: Strong

Literature Review

This guideline reflects the latest evidence and recommendations from the AAST and WSES 2020 guidelines. It is grounded in a comprehensive review of recent studies and clinical guidelines, ensuring that the recommendations are based on current best practices and evidence.

Version Control Record			
Version	**Date**	**Author / Reviewer**	**Description of Changes**
1	08/21/2024	Tracy Taggart, M.D. Brian Patterson, M.D. Andrew McCague, D.O. Paul Wisniewski, D.O.	Initial review and update to reflect latest evidence/practice

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