

Cholelithiasis, Biliary Colic, Cholecystitis and Cholangitis: Adult & Pediatric

Gastrointestinal

Clinical Decision Tools for RNs with Additional Authorized Practice [RN(AAP)s]

Effective Date: June 9, 2022

Background

Cholelithiasis is the presence of gallstones in the gallbladder, this condition may be asymptomatic (Heuman, 2019; Thomas, 2019). Biliary colic is right upper quadrant pain due to obstruction of a bile duct by a gallstone (Thomas, 2019). Cholecystitis is an inflammation of the gallbladder wall, usually caused by obstruction of the bile ducts by gallstones, and cholangitis is inflammation of the bile ducts (Thomas, 2019). Biliary colic, cholecystitis and cholangitis occur as a result of gallstone obstruction within the biliary tree (Thomas, 2019). Gallstones can develop if the gallbladder does not empty properly and/or if there is too much cholesterol in the bile (Thomas, 2019). Microscopic gallstones in the gallbladder can also cause symptoms. These tiny stones can form a type of sediment called biliary sludge (Thomas, 2019). Although gallbladder disease is uncommon in children it should be considered in any pediatric client who presents with right upper quadrant pain, jaundice or persistent symptoms (Neville, 2020).

Immediate Consultation Requirements

The RN(AAP) should seek immediate consultation from a physician/NP when any of the following circumstances exist:

- pediatric client;
- client is febrile and may require antibiotic therapy;
- systemic inflammatory response syndrome or sepsis; and/or
- peritoneal signs on abdominal exam (e.g., pain, distension, guarding, rebound tenderness) (Interprofessional Advisory Group [IPAG], personal communication, October 20, 2019).

Additionally, the RN(AAP) should initiate an intravenous fluid replacement as ordered by the physician/NP or as contained in an applicable RN Clinical Protocol within RN Specialty Practices if the client is vomiting and exhibits signs of dehydration as described in the *Adult and Pediatric Dehydration* Clinical Decision Tools.

Predisposing and Risk Factors

Predisposing and risk factors for cholelithiasis, biliary colic, cholecystitis, and cholangitis include:

- people of reproductive age who have higher levels of estrogen;
- ethnicity including northern European, Hispanic and Indigenous peoples;
- high fat diet;
- obesity;
- sudden weight loss;
- prolonged fasting;
- pregnancy;
- Crohn's disease;
- cystic fibrosis;
- diabetes;
- liver cirrhosis;
- sickle cell disease;
- thalassemia;
- aging;
- extensive bowel resection; and/or
- use of certain medications (e.g., oral contraceptive pills, chlorproMAZINE [Ilargactil], octreotide, and clofibrate) (Dynamed, 2018; Thomas, 2019).

Health History and Physical Exam

Subjective Findings

A client with cholelithiasis may be asymptomatic but gallstones are present in more than 90% of individuals who present with biliary colic, cholecystitis, and cholangitis.

The circumstances of the presenting complaint should be determined and may include:

- biliary pain due to gallstones lasting between 30 minutes to 24 hours, often precipitated by a meal;
- complaints of indigestion or dyspepsia;
- epigastric or right upper quadrant pain radiating to the right flank or back and frequently associated with nausea; and
- the pain is described as steady, moderate to severe in intensity and is not relieved with a bowel movement (Dynamed, 2014; Heuman, 2019; Thomas, 2019).

Biliary Colic

- acute onset of pain in the right upper quadrant of the abdomen or epigastrium,
- pain reaches a peak within one hour,
- tends to resolve gradually over one to five hours as the stone dislodges,
- may radiate to the right or left scapular region or back (Abraham et al., 2014; Dynamed, 2014; Thomas, 2019).

Cholecystitis

- right upper quadrant pain that is steady and lasts longer than six hours,
- nausea, vomiting, and low-grade fever is common (Bloom, 2021; Dynamed, 2018; Thomas, 2019).

Cholangitis

- recent biliary tract manipulation or history of choledocholithiasis (the presence of at least one gallstone in the common bile duct);
- fever, right upper quadrant pain, and jaundice (Charcot's triad) (Dynamed, 2018; Thomas, 2019).

Objective Findings

The signs and symptoms of cholelithiasis, biliary colic, cholecystitis, and cholangitis may include the following:

- abdominal pain (right upper quadrant),
- abdominal guarding may be present,
- fever (may be absent, especially in elderly),
- icterus (cholangitis),
- jaundice (cholangitis), and/or
- positive Murphy's sign (Dynamed, 2018; Thomas, 2019).

Differential Diagnosis

The following should be considered as part of the differential diagnosis:

- primary sclerosing cholangitis;
- abdominal aneurysm;
- gastroenteritis;
- hepatitis;
- mesenteric ischemia;
- myocardial infarction;
- small bowel obstruction;
- pancreatitis;
- pregnancy, eclampsia;
- urinary tract infections;
- renal calculi;
- diverticular and inflammatory bowel disease;
- peptic ulcer disease;

- malignancy;
- gastroenteritis; and/or
- appendicitis (Dynamed, 2018; Thomas, 2019).

Making the Diagnosis

History and physical exam will support cholelithiasis, biliary colic, cholecystitis and cholangitis as part of the differential diagnosis, but the definitive diagnosis is usually established by ultrasound (Dynamed, 2018; Thomas, 2019).

Investigations and Diagnostic Tests

There are no specific blood tests for making a diagnosis of cholelithiasis, biliary colic, cholecystitis and cholangitis. Lab work that may be ordered includes complete blood count, liver enzymes, lipase, amylase, high-sensitivity C-reactive protein (hs-CRP), and total bilirubin (Dynamed, 2018; Heuman, 2019; Thomas, 2019). An increase in the white blood cell count of more than 10,000 mm³/dL, an increase in hs-CRP level of more than 3 mg/dL, an increase of serum enzymes in the hepato-biliary-pancreatic system and elevated bilirubin would support these diagnoses (Dynamed, 2018; Thomas, 2019). Follow-up tests to confirm the diagnosis (e.g., ultrasound, computerized tomography) require a referral to a physician/NP.

Management and Interventions

Goals of Treatment

The primary goals of immediate treatment are to relieve pain, nausea and vomiting and prevent complications (e.g., sepsis, pancreatitis) (Thomas, 2019).

Non-Pharmacological Interventions

The RN(AAP) should recommend, as appropriate, the following non-pharmacological options:

- nothing by mouth until nausea and vomiting resolve, and
- consult with a physician/NP regarding nasogastric tube insertion (Thomas, 2019).

Pharmacological Interventions

The pharmacological interventions recommended for the treatment of cholelithiasis, biliary colic, cholecystitis, and cholangitis are in accordance with *Gallstones* (Dynamed, 2018) and *RxFiles: Drug comparison charts* (Rx Files Academic Detailing Program, 2021).

The RN(AAP) will consult with a physician/NP regarding pharmacological interventions for pediatric patients.

Analgesics and Antipyretics

	Drug	Dose	Route	Frequency	Duration
Adult					
	Ketorolac (Toradol)	30 mg	IM	q6h prn	1 day
THEN	Naproxen	500 mg	p.o.	b.i.d. prn	5-7 days
OR	Ibuprofen	600-800 mg (maximum dose of 2400-3600 mg/day)	p.o.	q6-8h prn	5-7 days
AND/ OR	Acetaminophen	500-1000 mg (maximum dose of 4 g/day)	p.o.	q4-6h prn	5-7 days

Antiemetics

Clients who are stable can be provided with a prescription for oral DimenhyDRINATE or Hyoscine in the doses listed while awaiting diagnostic testing.

	Drug	Dose	Route	Frequency	Duration
Adult					
	DimenhyDRINATE (Gravol)	25-50 mg	p.o., IM, IV	q4-6h prn	as needed
OR	Hyoscine (Buscopan)	10-20 mg (maximum 60 mg per day)	p.o., IM, IV	q6h prn	as needed

Antibiotics

Consultation with a physician/NP is required for antibiotic therapy.

Client and Caregiver Education

The RN(AAP) provides client and caregiver education as follows:

- Counsel about appropriate use of medications (dose, frequency, compliance, etc.).
- Assist in the identification of dietary choices that may trigger an attack and recommend ways to reduce or eliminate them (Thomas, 2019).

Monitoring and Follow-Up

The RN(AAP) should monitor vital signs, and intake and output. If pain resolves the client may be discharged home with a referral for diagnostic tests on an outpatient basis. If the client's pain does not improve within one to two hours and/or condition deteriorates, immediate consultation is required.

Complications

The following complications may be associated with cholelithiasis, biliary colic, cholecystitis, and cholangitis:

- obstructive cholangitis secondary to choledocholithiasis,
- gangrenous cholecystitis,
- emphysematous cholecystitis,
- gallbladder torsion,
- cancer of the gallbladder,
- sepsis,
- pancreatitis,
- hepatitis,
- choledocholithiasis, and/or
- gallbladder perforation (Dynamed, 2018; Heuman, 2019; Thomas, 2019).

Referral

Refer to a physician/NP if client presentation is consistent with those identified in the *Immediate Consultation Requirements* section, the client does not respond to first line treatment, has recurrent symptoms typical of biliary pain, but without gallstones on ultrasound, diagnosis is uncertain, non-narcotic analgesics are contraindicated due to underlying renal impairment or allergy/intolerance, and patient is febrile (IPAG, personal communication, October 20, 2019).

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