

Specific Care Question

In pediatric patients with underlying liver disease and acute cholangitis without bacteremia, how does the use of a narrow-spectrum antimicrobial regimen (e.g., ceftriaxone + metronidazole) compare with a broad-spectrum regimen (e.g., piperacillin-tazobactam) in terms of clinical resolution, recurrence rates, or prevention of complications (e.g., biliary sepsis, abscess, increased length of stay)?

Rationale for Question Asked

In pediatric patients with chronic liver and biliary disease, including those with post-Kasai biliary atresia, acute cholangitis is common and frequently diagnosed and treated based on clinical presentation, rather than microbiologic confirmation.¹ Clinically, most patients with suspected cholangitis receive early empiric broad-spectrum IV antibiotics to prevent progression of infection, limit further liver damage, and promote clinical improvement.^{1,2} Empiric regimens are typically selected to provide coverage against Enterobacterales, *Enterococcus* species, and occasionally *Pseudomonas aeruginosa*, as blood cultures are frequently negative in this population.³ Consequently, clinicians often lack microbiologic data to confirm whether the initial empiric antibiotic choice was optimal or to guide safe narrowing of antimicrobial treatment.¹⁻³ The tension between preventing serious infection-related harm and minimizing unnecessary antibiotic exposure, combined with limited pediatric-specific guidance, underscores why optimal antibiotic selection in non-bacteremic pediatric acute cholangitis remains an important and unresolved question in both clinical care and antimicrobial stewardship.

The intent of this review is not to provide a clinical recommendation, but to summarize the available evidence to inform clinical decision-making. Such decisions should consider the evidence presented alongside potential benefits and harms, patient and family values, feasibility, and acceptability within clinical practice.

Evidence Gaps

Available pediatric literature addresses epidemiology and severity stratification; however, it does not provide guidance on antibiotic spectrum selection for nonbacteremic cholangitis.

Study Characteristics.

The literature search time frame was determined a priori based on disease-specific guidelines, with the intent of capturing evidence most relevant to current guideline-informed practice. The search for suitable studies was completed on February 12, 2026. A. Wirtz screened the 130 titles and/or abstracts identified through the search and selected two guidelines, five secondary reviews, and six primary studies for full-text review.^{1,3-15} The literature was further evaluated to identify additional studies that might address the question of interest. Through this reference searching, 15 additional articles were obtained for full-text review.^{2,16-29}

Following a detailed evaluation, none of the included articles directly addressed the specific clinical question.³⁰ In particular, no studies compared the use of narrow-spectrum antimicrobial regimens with broad-spectrum regimens. The identified guidelines relied primarily on adult literature, while the eligible primary studies focused on comparisons between culture-positive and culture-negative cholangitis, mild or moderate versus severe cholangitis, simple versus intractable cholangitis, bile samples from patients with and without cholangitis, or outcomes associated with prolonged (> 6 weeks) antibiotic therapy.

Identification of Studies**Search Strategy and Results** (see Figure 1)

- 1) "Cholangitis"[Mesh] OR cholangitis[tiab] OR cholangitis[tw]
- 2) "Anti-Bacterial Agents"[Mesh] OR "Antibiotic Prophylaxis"[Mesh] OR antibiotic*[tiab] OR antibiotic*[tw]

Critically Appraised Topic (CAT): Acute Cholangitis and Antibiotic Choice

- 3) ("Biliary Atresia"[Mesh] OR "biliary atresia" OR "Liver Diseases"[Mesh] OR "liver disease" OR hepatoportoenterostomy OR portoenterostomy OR "Portoenterostomy, Hepatic"[Mesh] OR "chronic liver disease" OR "chronic hepatic disease") NOT "Chemical and Drug Induced Liver Injury"[Mesh]
 - 4) #1 AND #2 AND #3
 - 5) #4 NOT (elderly OR geriatric OR gerontology)
 - 6) #5 limited to 2011-2026
- Search Dates: 2011-Current
 Records identified through database searching, $n = 130$
 Additional records identified through other sources, $n = 15$

Studies Not Included in this Review with Exclusion Rationale

Citation	Reason for exclusion
Aziz et al. (2025)	Wrong comparator: Compared infants with culture-positive cholangitis to culture-negative cholangitis
Baek et al. (2020)	Wrong comparator: Compared children who developed cholangitis to children who did not
Calinescu et al. (2022)	Descriptive review
Calinescu and Wildhaber (2024)	Descriptive review
Cheung et al. (2018)	Descriptive review
Chung et al. (2018)	Wrong comparator: Compared children with simple cholangitis to those with intractable cholangitis
Chung et al. (2020)	Wrong comparator: Compared children following Kasai portoenterostomy across two historical periods (1980–2007 vs. 2008–2016) with heterogeneous surgical timing and prophylaxis protocols
Chung et al. (2021)	Wrong comparator: Examined survival outcomes following Kasai portoenterostomy without relevant treatment or route comparison
de Vries (2011)	Descriptive review (thesis)
El-Shabrawi and Kamal (2011)	Descriptive review
Forster et al. (2023)	Wrong comparator: Compared bile samples from children meeting criteria for acute cholangitis with those not meeting criteria
Gomi et al. (2017)	Guidelines based primarily on adult literature (antimicrobial therapy)
Haal et al. (2020)	Wrong population: Systematic review combining adult and pediatric studies without stratified analysis; included bacterial acute cholangitis
Jeropoulos et al. (2024)	Descriptive review
Johnson et al. (2021)	Wrong population: Adult-only study
Kogure et al. (2011)	Wrong comparator: Compared moderate versus severe cholangitis
Lee et al. (2014)	Wrong outcome: Focused on causative organisms and cost of care rather than treatment strategy
Liu et al. (2019)	Wrong comparator: Compared children who experienced cholangitis to those who did not
Mahajan et al. (2023)	Wrong population: Intractable cholangitis treated with prolonged (> 6 weeks) IV antibiotics
Miura et al. (2018)	Guidelines based primarily on adult literature (treatment of acute cholangitis)
Pandurangi et al. (2023)	Wrong comparator: Historical comparison of infants undergoing Kasai portoenterostomy with differing surgical timing and prophylaxis protocols

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 If you have questions regarding this CAT – please contact evidencebasedpractice@cmh.edu

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***Critically Appraised Topic (CAT):
Acute Cholangitis and Antibiotic Choice***

Ramachandran et al. (2019)	Wrong comparator: Compared children who developed cholangitis after Kasai portoenterostomy to those who did not
Salvador et al. (2017)	Wrong comparator: Compared children who developed cholangitis to those who did not
Samanta and Sarma (2025)	Descriptive review
Shin et al. (2011)	Wrong population: Children with intractable cholangitis receiving home-based IV antibiotic therapy
Stagg et al. (2017)	Wrong comparator: Compared the management of biliary atresia between surgeons and gastroenterologists
Wang et al. (2023)	Wrong comparator: Compared mild versus severe cholangitis using heterogeneous broad-spectrum antibiotic regimens and adjunctive therapies

Question Originator

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Findings from this review were presented to the question originator, K. Berg, MD, FAAP, and J. Dusin, PhD, RD, CPHQ, on March 23, 2026.

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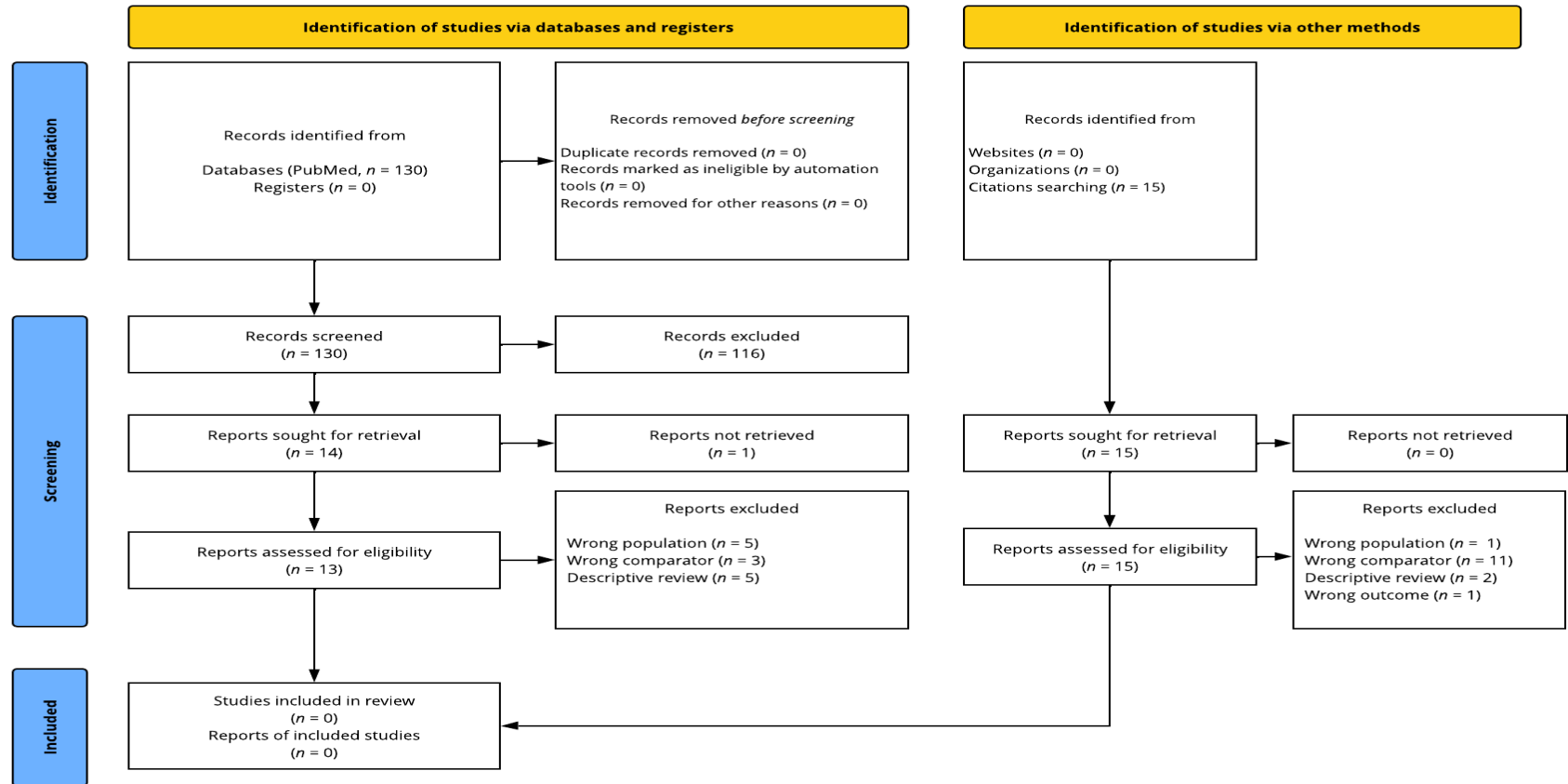
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Figure 1. PRISMA 2020 Flow Diagram of Study Selection

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)³¹



From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;372:n71. doi:10.1136/bmj.n71

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