American College of Radiology ACR Appropriateness Criteria®

Radiologic Management of Biliary Obstruction

Variant 1: Initial therapeutic procedure for a patient with dilated bile ducts from choledocholithiasis.

D 1	Appropriateness	COF	A L L DDI	D I DDI	D 41	34.11			I	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Endoscopic internal biliary catheter (removable plastic stent)	Usually appropriate	Moderate	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		7 (21872710)			3										
		10 (8813987)			2										
Percutaneous internal/external biliary catheter	May be appropriate	Limited	N/A	N/A	6	6	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		24 (12204406)	ı		4										
		25 (21638145)	ı		3										
		23 (3566375)			4										
		26 (11577321)	1		4										
		27 (23782350)			4										
Surgery	Usually not appropriate	Limited	N/A	N/A	2	n/a	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		25 (21638145)			3										
		28 (23999986)			4										
Medical management only	Usually not appropriate	Expert Consensus	N/A	N/A	2	2	0	0	0	0	0	0	0	0	0

Permanent biliary metallic stent	Usually approp	y not oriate	Limited	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0
			References		Study	Quality										
			7 (21872710)			3										
			11 (21684464)			4										
Removable biliary covered stent	May approp	be oriate	Expert Consensus	N/A	N/A	4	4	0	0	0	0	0	0	0	0	0
Endoscopic US-guided biliary drainage (EUS-BD)	May approp	be oriate	Limited	N/A	N/A	4	4	0	0	0	0	0	0	0	0	0
			References		Study	Quality										
			12 (26020052)			4										

Variant 2: Initial therapeutic procedure for a patient with elevated bilirubin and suspected sclerosing cholangitis.

D 1	Appropri	ateness	COE	A L L DDI	_	n i nnr	D 4	3.6.11			F	inal '	Tabu l	latio	ns		
Procedure	Categ		SOE	Adults RRI	L	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Endoscopic internal biliary catheter (removable plastic stent)	Usua approp		Limited	N/A		N/A	8	8	0	0	0	0	0	0	0	0	0
			References			Study	Quality										
			39 (10483999)				2										
			38 (3584158)				4										
			35 (21241424)				4										
Percutaneous internal/external biliary catheter	May approp		Limited	N/A		N/A	6	6	0	0	0	0	0	0	0	0	0
			References		•	Study	Quality										
			35 (21241424)				4										
			37 (3876737)				3										
Surgery	Usuall approp		Strong	N/A		N/A	2	n/a	0	0	0	0	0	0	0	0	0
			References		•	Study	Quality										

	43 (19845177)			4										
	41 (9527065)			2										
	42 (18471705)			2										
May be appropriate	Strong	N/A	N/A	6	6	0	0	0	0	0	0	0	0	0
	References		Stud	y Quality										
	32 (24914504)			2										
	33 (27981301)			1										
	34 (15565569)			1										
Usually not appropriate	Limited	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0
	References		Stud	y Quality										
	11 (21684464)			4										
	40 (20630513)			3										
Usually not appropriate	Limited	N/A	N/A	2	2	0	0	0	0	0	0	0	0	0
	References		Stud	y Quality										
	40 (20630513)			3										
	Usually not appropriate Usually not Usually not	41 (9527065) 42 (18471705) May be appropriate Strong References 32 (24914504) 33 (27981301) 34 (15565569) Usually not appropriate Limited References 11 (21684464) 40 (20630513) Usually not appropriate Limited References	May be appropriate Strong N/A	May be appropriate Strong N/A N/A	May be appropriate Strong N/A N/A 6	May be appropriate Strong N/A N/A 6 6	May be appropriate Strong N/A N/A 6 6 0	May be appropriate Strong N/A N/A 6 6 0 0	A1 (9527065) 2	41 (9527065) 2	May be appropriate	May be appropriate Strong N/A N/A 6 6 0 0 0 0 0 0 0	May be appropriate Strong N/A N/A 6 6 0 0 0 0 0 0 0 0	A1 (9527065) 2

Variant 3: Initial therapeutic procedure for a liver transplant recipient with elevated bilirubin and suspected biliary anastomotic stenosis or bile leak, with no dilated ducts.

D 1	Appropriateness	COE	ALL DDI	D I DDI	D 41	37.11			F	inal '	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Endoscopic internal biliary catheter (removable plastic stent)	Usually appropriate	Strong	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0

References	Study Quality
49 (21280189)	2
48 (16116539)	4
50 (18702031)	2
51 (29026597)	Good

		52 (24587819)			1										
		56 (23432435)			4										
Percutaneous internal/external biliary catheter	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Stud	y Quality							!		!	
		49 (21280189)			2										
		46 (26689137)			4										
		56 (23432435)			4										
Surgery	Usually not appropriate	Strong	N/A	N/A	3	n/a	0	0	0	0	0	0	0	0	0
		References		Stud	y Quality										
		58 (11907771)			2										
		46 (26689137)			4										
		59 (2799642)			2										
Medical management only	Usually not appropriate	Limited	N/A	N/A	2	2	0	0	0	0	0	0	0	0	0
		References		Stud	y Quality		•	•	•			•		•	
		46 (26689137)			4										
Permanent biliary metallic stent	Usually not appropriate	Limited	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0
		References		Stud	y Quality										
		52 (24587819)			1										
Removable biliary covered stent	May be appropriate	Limited	N/A	N/A	5	5	0	0	1	0	6	2	0	0	0
		References		Stud	y Quality										
		52 (24587819)			1										
Endoscopic US-guided biliary drainage (EUS-BD)	Usually not appropriate	Expert Consensus	N/A	N/A	3	3	0	0	0	0	0	0	0	0	0

Variant 4: Initial therapeutic procedure for a patient with bile leak and dilated bile ducts following laparoscopic cholecystectomy.

	Appropriateness	207							F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Endoscopic internal biliary catheter (removable plastic stent)	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Study	Quality		•								
		61 (23322833)			4										
		62 (20575884)			4										
		67 (24954866)			4										
		66 (19220666)			2				1						
Percutaneous internal/external biliary catheter	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Study	Quality		-								
		61 (23322833)			4										
		68 (14759778)			2										
		69 (18922456)			4										
Surgery	May be appropriate	Limited	N/A	N/A	4	n/a	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		67 (24954866)			4										
		68 (14759778)			2										
		69 (18922456)		1	4										
Medical management only	Usually not appropriate	Expert Consensus	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0
Permanent biliary metallic stent	Usually not appropriate	Expert Consensus	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0
Removable biliary covered stent	Usually not appropriate	Limited	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		71 (24661988)			4										

Endoscopic US-guided biliary drainage (EUS-BD)	Usually not appropriate	Expert Consensus	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0	
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Variant 5: Initial therapeutic procedure for a patient with dilated bile ducts and suspected biliary sepsis or acute cholangitis.

	Appropriateness	COF	A L L DDI	D 1 DD1	D ()	3.7.11			F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Endoscopic internal biliary catheter (removable plastic stent)	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Study	y Quality										
		79 (1371206)			3										
		80 (9336514)			4										
		81 (28834389)			1										
Percutaneous internal/external biliary catheter	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Study	y Quality		•				•				
		69 (18922456)			4										
		77 (28419764)			4					_	_				
Surgery	Usually not appropriate	Limited	N/A	N/A	2	n/a	0	0	0	0	0	0	0	0	0
		References		Study	y Quality		-								
		79 (1371206)			3										
		80 (9336514)			4										
Medical management only	Usually not appropriate	Expert Consensus	N/A	N/A	2	2	0	0	0	0	0	0	0	0	0
Permanent biliary metallic stent	Usually not appropriate	Limited	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0
		References		Study	y Quality		•								
		81 (28834389)			1										

Removable biliary covered stent	Usuall approp	· .	Expert Consensus	N/A	N/A	2	2	0	0	0	0	0	0	0	0	0
Endoscopic US-guided biliary drainage (EUS-BD)	May approp		Limited	N/A	N/A	4	4	0	0	0	0	0	0	0	0	0
			References		Study	Quality										
			88 (27122677)			4										

Variant 6: Initial therapeutic procedure for a patient with malignant common bile duct obstruction (eg, pancreatic carcinoma).

December	Appropriateness	COF	A J14. DDI	D. J. DDY	D - 43	Malla]	Final	Tabu	ılatio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Endoscopic internal biliary catheter (removable plastic stent)	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Study	y Quality					•				•	
		95 (26290631)	ı		4										
		96 (22415652)			1										
Percutaneous internal/external biliary catheter	Usually appropriate	Strong	N/A	N/A	7	7	0	0	0	0	0	0	0	0	0
		References		Study	y Quality					•				•	
		109 (25148939)	(Good										
		110 (19609609)		3										
		111 (24064748)		3										
		112 (12354980)		1										
Surgery	May be appropriate	Strong	N/A	N/A	5	n/a	0	0	0	0	0	0	0	0	0
		References		Study	y Quality		<u>-</u>			•					
		113 (21068488)		2										
		114 (19606687)		2										
		115 (-3138827))	(Good										
		116 (16632990))		4										

Medical management only	Usually approp	y not riate	Limited	N/A		N/A	3	3	0	0	0	0	0	0	0	0	0
			References			Study	y Quality										
			89 (26322156)				4										
Percutaneous biliary metallic stent	May approp	be riate	Strong	N/A		N/A	5	5	0	0	0	0	0	0	0	0	0
			References		•	Stud	y Quality	•		•		•	•	•		•	
			95 (26290631)				4										
			96 (22415652)				1										
			97 (16650542)				4										
			90 (26911896)				4										
			98 (20467870)				1										
			99 (21034892)			1			,	,	,					_	
Removable biliary covered stent	May approp	be riate	Strong	N/A		N/A	5	5	0	0	0	0	0	0	0	0	0
			References			Stud	y Quality		•								
			90 (26911896)				4										
			98 (20467870)				1										
			99 (21034892)				1					•					
Endoscopic US-guided biliary drainage (EUS-BD)	May approp	be riate	Strong	N/A		N/A	4	4	0	0	0	0	0	0	0	0	0
			References			Study	y Quality	•									
		104 (21963067)					3										
			105 (23523301)				2										
			106 (23021167)		3												
			107 (22810111)				1										

Variant 7: Initial therapeutic procedure for a patient with hilar biliary obstruction from malignant etiology (eg, Klatskin tumor).

	Appropriatene	SS GOT							F	inal	Tabu	latio	ns		
Procedure	Category	SOE SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6		8	9
Endoscopic internal biliary catheter (removable plastic stent)	May be appropriate	Strong	N/A	N/A	6	6	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		118 (15922889)	ı		2										
		119 (19756881)	1		2										
		120 (18585976)	1		1										
		121 (18657806))		2										
		122 (16437689))		3						1				
Percutaneous internal/external biliary catheter	Usually appropriate	Strong	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		118 (15922889)	ı		2										
		119 (19756881)	ı		2										
		120 (18585976)	1		1										
		121 (18657806))		2										
		122 (16437689))		3					1	1	1			
Surgery	May be appropriate	Expert Consensus	N/A	N/A	5	n/a	0	0	0	0	0	0	0	0	0
Medical management only	Usually not appropriate	Strong	N/A	N/A	2	2	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		117 (17461441))		4										
		118 (15922889)	ı		2										
		119 (19756881)	ı		2										
Permanent biliary metallic stent	May be appropriate	Expert Consensus	N/A	N/A	6	6	0	0	0	0	0	0	0	0	0
Removable biliary covered stent	May be appropriate	Expert Consensus	N/A	N/A	5	5	0	0	0	0	0	0	0	0	0

Endoscopic US-guided biliary drainage (EUS-BD)	Usuall approp	Limited	N/A	N/A	3	3	0	0	0	0	0	0	0	0	0	
	·	References		Stu	ly Quality											
		124 (25264761))		2											
		123 (25024600))		4											
		125 (23711555))		4											
		126 (26379410))		4											

Variant 8: Initial therapeutic procedure for a patient with dilated bile ducts and coagulopathy (INR >2.0 or platelet count <60 K).

D 1	Appropriateness	COF	A L L DDI	D I DDI	D 41	3.5 11	Final Tabulation				latio	ons			
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Endoscopic internal biliary catheter (removable plastic stent)	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		128 (18042116))		4										
		81 (28834389)			1										
Percutaneous internal/external biliary catheter	May be appropriate	Limited	N/A	N/A	6	6	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		129 (20307987))		4										
		130 (22864606))		3										
		81 (28834389)			1		_								
Surgery	Usually not appropriate	Expert Consensus	N/A	N/A	2	n/a	0	0	0	0	0	0	0	0	0
Medical management only	May be appropriate	Expert Consensus	N/A	N/A	4	4	0	0	0	0	0	0	0	0	0
Permanent biliary metallic stent	Usually not appropriate	Expert Consensus	N/A	N/A	1	1	0	0	0	0	0	0	0	0	0

Removable biliary covered stent	Usually not appropriate	Expert Consensus	N/A	N/A	2	2	0	0	0	0	0	0	0	0	0
Endoscopic US-guided biliary drainage (EUS-BD)	Usually not appropriate	Expert Consensus	N/A	N/A	3	3	0	0	0	0	0	0	0	0	0

Variant 9: Initial therapeutic procedure for a patient with dilated bile ducts and moderate to massive ascites.

D	Appropriatene	ess coe	A J14- DD	I D. J. DDI	D - 45	M. 1!			F	inal '	Tabu	latio	ns		
Procedure	Category	SOE	Adults RR	L Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Endoscopic internal biliary catheter (removable plastic stent)	Usually appropriate	Limited	N/A	N/A	8	8	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		133 (22464717)			2		_								
Percutaneous internal/external biliary catheter	May be appropriate	Limited	N/A	N/A	5	5	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		133 (22464717)	١		2		_			_				_	
Surgery	Usually not appropriate	Expert Consensus	N/A	N/A	2	n/a	0	0	0	0	0	0	0	0	0
Medical management only	May be appropriate	Limited	N/A	N/A	4	4	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		131 (6606961)			4										
		132 (24433643)			3										
		133 (22464717)			2										
Permanent biliary metallic stent	Usually not appropriate	Expert Consensus	N/A	N/A	2	2	0	0	0	0	0	0	0	0	0
Removable biliary covered stent	May be appropriate	Expert Consensus	N/A	N/A	4	4	0	0	0	0	0	0	0	0	0

Endoscopic US-guided biliary drainage (EUS-BD)	Usuall approp	٠. ا	Limited	N/A	N/A	3	3	0	0	0	0	0	0	0	0	0
			References		Study	Quality										

 References
 Study Quality

 134 (26811666)
 4

 135 (27129552)
 2

Appendix Key

A more complete discussion of the items presented below can be found by accessing the supporting documents at the designated hyperlinks.

Appropriateness Category: The panel's recommendation for a procedure based on the assessment of the risks and benefits of performing the procedure for the specified clinical scenario.

SOE: Strength of Evidence. The assessment of the amount and quality of evidence found in the peer reviewed medical literature for an appropriateness recommendation.

- **References:** The citation number and PMID for the reference(s) associated with the recommendation.
- Study Quality: The assessment of the quality of an individual reference based on the number of study quality elements described in the reference.

RRL: Relative Radiation Level. A population based assessment of the amount of radiation a typical patient may be exposed to during the specified procedure.

Rating: The final rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Median: The median rating (1-9 scale) for the procedure as determined by the panel during rating rounds.

Final tabulations: A histogram showing the number of panel members who rated the procedure as noted in the column heading (ie, 1, 2, 3, etc.).

Additional supporting documents about the AC methodology and processes can be found at www.acr.org/ac.