American College of Radiology
ACR Appropriateness Criteria®

Chronic Liver Disease

Variant 1: Chronic liver disease. Diagnosis and staging of liver fibrosis. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations 1	2	3	4	5	6	7	8	9
MR elastography abdomen	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	0	2	9	3

References	Study Quality
25 (25305349)	4
24 (19022517)	4
26 (28965721)	3

US shear wave elastography abdomen	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	0	1	9	4

References	Study Quality
37 (18095306)	2
38 (18836992)	3
26 (28965721)	3

MRI abdomen without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	0	0	1	0	6	6	0	0	1

References	Study Quality
28 (22566123)	2
29 (22278368)	Good
30 (21879400)	2

MRI abdomen without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	5	5	0	0	2	1	10	1	0	0	0

References	Study Quality
28 (22566123)	2
29 (22278368)	Good
30 (21879400)	2

US abdomen	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	1	10	1	1	1	1

References	Study Quality
33 (16437635)	2
24 (19022517)	4
34 (12216750)	4

MRI abdomen without and with hepatobiliary contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	5	5	0	0	2	0	9	4	1	0	0

References	Study Quality
31 (23538889)	2
32 (21248234)	2

CT abdomen with IV contrast multiphase	May be appropriate	Limited	☢☢☢☢ 10-30 mSv		5	5	0	0	1	4	9	0	0	0	0

References	Study Quality
23 (23192205)	3
21 (24261358)	4
22 (23169796)	3

US duplex Doppler abdomen	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	2	8	1	2	0	0

References	Study Quality
40 (17924952)	2
41 (15837406)	3

US abdomen with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	4	4	1	0	4	5	4	0	0	0	0

References	Study Quality
35 (27538445)	4
36 (27161854)	3

CT abdomen without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	6	1	4	2	1	0	0	0	0

References	Study Quality
21 (24261358)	4
22 (23169796)	3

CT abdomen without and with IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	3	3	4	2	8	0	0	0	0	0	0

References	Study Quality
23 (23192205)	3
21 (24261358)	4
22 (23169796)	3

FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	2	0	0	0	0	0	0	0

Variant 2: Chronic liver disease. No prior diagnosis of hepatocellular carcinoma (HCC). Screening and surveillance for HCC.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI abdomen without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	1	0	0	0	1	2	3	5	4

References	Study Quality
51 (18069697)	2
55 (20616602)	4
46 (20732773)	1
47 (22526270)	2
52 (15719410)	3
53 (23218794)	2
54 (22553295)	2

US abdomen	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	2	3	3	3	5

References	Study Quality
55 (20616602)	4
13 (28620797)	4
10 (29624699)	4

MRI abdomen without and with hepatobiliary contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	1	0	0	0	2	2	5	3	3

References	Study Quality
57 (24475864)	3
58 (29629800)	4
56 (28886231)	4

CT abdomen with IV contrast multiphase	May be appropriate (Disagreement)	Expert Opinion	☢☢☢☢ 10-30 mSv		5	5	0	1	2	1	1	3	4	2	0

References	Study Quality
46 (20732773)	1
47 (22526270)	2
45 (19802612)	3

US duplex Doppler abdomen	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	1	0	1	6	0	2	1	2	1
MRI abdomen without IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	4	4	1	0	3	5	5	1	1	0	0
CT abdomen without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	5	3	5	2	1	0	0	0	0

References	Study Quality
45 (19802612)	3

CT abdomen without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	3	3	3	2	9	0	0	0	0	0	0

MR elastography abdomen	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	4	2	7	0	2	1	0	0	0
	References			Study Quality											
	50 (24636468)			4											
US shear wave elastography abdomen	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	1	4	7	1	2	0	1	0	0
	References			Study Quality											
	71 (23345944)			4											
	70 (21330078)			3											
US abdomen with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	0	2	9	1	1	1	0	0	0
	References			Study Quality											
	69 (23137926)			4											
	14 (18834687)			3											
	67 (18779929)			3											
	68 (16953832)			3											
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	9	3	4	0	0	0	0	0	0
	References			Study Quality											
	49 (10845666)			3											

Variant 3: Chronic liver disease. Previous diagnosis of HCC. Post-treatment monitoring for HCC.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI abdomen without and with IV contrast	Usually appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	0	6	10
CT abdomen without and with IV contrast	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	8	8	0	0	0	0	0	1	2	10	1

		References		Study Quality												
		72 (17259838)		2												
		73 (15671002)		2												
MRI abdomen without and with hepatobiliary contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	1	2	2	3	7	1	
		References		Study Quality												
		57 (24475864)		3												
		78 (28859233)		4												
CT abdomen with IV contrast multiphase	Usually appropriate	Strong	☢☢☢☢ 10-30 mSv		8	8	0	0	0	0	0	2	5	9	0	
		References		Study Quality												
		72 (17259838)		2												
		73 (15671002)		2												
MRI abdomen without IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	1	1	5	6	1	0	0	0	
US abdomen with IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	0	2	2	9	0	0	1	0	
US abdomen	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	4	4	0	0	8	6	0	2	0	0	0	
CT abdomen without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	4	4	4	4	0	0	0	0	0	
		References		Study Quality												
		74 (25153274)		4												
MR elastography abdomen	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	4	2	9	1	0	0	0	0	0	
		References		Study Quality												
		50 (24636468)		4												
US shear wave elastography abdomen	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	3	5	8	0	0	0	0	0	0	
		References		Study Quality												

		82 (23558071)	4													
		71 (23345944)	4													
		70 (21330078)	3													
US duplex Doppler abdomen	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	2	1	6	4	1	1	1	0	0
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	5	5	2	2	2	0	0	0	0
		References	Study Quality													
		76 (23615075)	4													

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.**