American College of Radiology
ACR Appropriateness Criteria®

Liver Lesion — Initial Characterization

Variant 1: Indeterminate >1 cm lesion on initial imaging with ultrasound. Normal liver. (No suspicion or evidence of extrahepatic malignancy or underlying liver disease.)

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	Usually appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		5	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0

Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0

Variant 2: Indeterminate >1 cm lesion on initial imaging with CT (without or with contrast). Normal liver. (No suspicion or evidence of extrahepatic malignancy or underlying liver disease.)

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	Usually appropriate		O 0 mSv	O 0 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		5	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0

Variant 3: Indeterminate >1 cm lesion on initial imaging with noncontrast-enhanced MRI. Normal liver. (No suspicion or evidence of extrahepatic malignancy or underlying liver disease.)

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	May be appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		5	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0

Variant 4: Indeterminate >1 cm lesion on initial imaging with ultrasound. Known history of an extrahepatic malignancy.

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	Usually		O 0 mSv	O 0 mSv	8	n/a	0	0	0	0	0	0	0	0	0

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
IV contrast	appropriate			[ped]											
MRI abdomen without IV contrast	Usually appropriate		O 0 mSv	O 0 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	Usually appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	Usually appropriate		Varies		7	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	May be appropriate		☢☢☢☢ 10-30 mSv		6	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0

Variant 5: Indeterminate >1 cm lesion on initial imaging with CT (without or with contrast). Known history of an extrahepatic malignancy.

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	Usually		O 0 mSv	O 0 mSv	8	n/a	0	0	0	0	0	0	0	0	0

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
IV contrast	appropriate			[ped]											
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	Usually appropriate		Varies		7	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	May be appropriate		☢☢☢☢ 10-30 mSv		6	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0

Variant 6: Indeterminate >1 cm lesion on initial imaging with noncontrast-enhanced MRI. Known history of an extrahepatic malignancy.

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	Usually appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0

CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	Usually appropriate		Varies		7	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	May be appropriate		☢☢☢☢ 10-30 mSv		6	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0

Variant 7: Indeterminate >1 cm lesion on initial imaging with ultrasound. Known or suspected liver disease associated with a high risk of hepatocellular carcinoma (chronic hepatitis, cirrhosis, hemochromatosis, etc.)

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		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0

Percutaneous image-guided biopsy liver	May be appropriate		Varies		6	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	May be appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0

Variant 8: Indeterminate >1 cm lesion on initial imaging with CT (without or with contrast). Known or suspected liver disease associated with a high risk of hepatocellular carcinoma (chronic hepatitis, cirrhosis, hemochromatosis, etc.)

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		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		6	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0

Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0

Variant 9: Indeterminate >1 cm lesion on initial imaging with noncontrast-enhanced MRI. Known or suspected liver disease associated with a high risk of hepatocellular carcinoma (chronic hepatitis, cirrhosis, hemochromatosis, etc.)

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		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		6	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	May be appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0

Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0

Variant 10: Indeterminate <1 cm lesion on initial imaging with ultrasound. Normal liver. (No suspicion or evidence of extrahepatic malignancy or underlying liver disease.)

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	May be appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	Usually not appropriate		Varies		3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0

Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0

Variant 11: Indeterminate <1 cm lesion on initial imaging with CT (without or with contrast). Normal liver. (No suspicion or evidence of extrahepatic malignancy or underlying liver disease.)

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	Usually not appropriate		Varies		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0

Variant 12: Indeterminate <1 cm lesion on initial imaging with noncontrast-enhanced MRI. Normal liver. (No suspicion or evidence of extrahepatic malignancy or underlying liver disease.)

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	May be appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	Usually not appropriate		Varies		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0

Variant 13: Indeterminate <1 cm lesion on initial imaging with ultrasound. Known history of an extrahepatic malignancy.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		6	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without and with IV contrast	Usually appropriate		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	May be appropriate		☢☢☢☢ 10-30 mSv		4	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	Usually appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0

Variant 14: Indeterminate <1 cm lesion on initial imaging with CT (without or with contrast). Known history of an extrahepatic malignancy.

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		6	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	May be appropriate		☢☢☢☢ 10-30 mSv		4	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0

Variant 15: Indeterminate <1 cm lesion on initial imaging with noncontrast-enhanced MRI. Known history of an extrahepatic malignancy.

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		O 0 mSv	O 0 mSv [ped]	8	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0

CT abdomen with IV contrast	Usually appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		6	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	May be appropriate		☢☢☢☢ 10-30 mSv		4	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	4	n/a	0	0	0	0	0	0	0	0	0

Variant 16: Indeterminate <1 cm lesion on initial imaging with ultrasound. Known or suspected liver disease associated with a high risk of hepatocellular carcinoma (chronic hepatitis, cirrhosis, hemochromatosis, etc.)

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		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	May be appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0

Percutaneous image-guided biopsy liver	May be appropriate		Varies		6	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0

Variant 17: Indeterminate <1 cm lesion on initial imaging with CT (without or with contrast). Known or suspected liver disease associated with a high risk of hepatocellular carcinoma (chronic hepatitis, cirrhosis, hemochromatosis, etc.)

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		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		6	n/a	0	0	0	0	0	0	0	0	0
MRI abdomen without IV contrast	May be appropriate		O 0 mSv	O 0 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0

Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0

Variant 18: Indeterminate <1 cm lesion on initial imaging with noncontrast-enhanced MRI. Known or suspected liver disease associated with a high risk of hepatocellular carcinoma (chronic hepatitis, cirrhosis, hemochromatosis, etc.)

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		O 0 mSv	O 0 mSv [ped]	9	n/a	0	0	0	0	0	0	0	0	0
CT abdomen without and with IV contrast	Usually appropriate		☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0
CT abdomen with IV contrast	May be appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	n/a	0	0	0	0	0	0	0	0	0
Percutaneous image-guided biopsy liver	May be appropriate		Varies		6	n/a	0	0	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m sulfur colloid scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0
Tc-99m RBC scan liver	Usually not appropriate		☢☢☢ 1-10 mSv		3	n/a	0	0	0	0	0	0	0	0	0

CT abdomen without IV contrast	Usually not appropriate		☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	n/a	0	0	0	0	0	0	0	0	0
In-111 somatostatin receptor scintigraphy	Usually not appropriate		☢☢☢☢ 10-30 mSv		3	n/a	0	0	0	0	0	0	0	0	0
US abdomen	May be appropriate		O 0 mSv	O 0 mSv [ped]	5	n/a	0	0	0	0	0	0	0	0	0

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.**