

American College of Radiology
ACR Appropriateness Criteria®

Evaluation of Cardiac Masses

Variant 1: Adult. Suspected cardiac mass. No known cardiac mass. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US echocardiography transthoracic resting	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	1	0	0	0	0	0	2	2	8
		References		Study Quality											
		39 (21757159)		3											
		38 (2768712)		4											
		29 (16824834)		3											
		35 (32036237)		2											
		32 (19679285)		1											
		37 (32279620)		4											
		19 (26765302)		4											
		9 (34396236)		4											
MRI heart function and morphology without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	0	1	1	0	0	0	2	7	3
		References		Study Quality											
		36 (25913472)		4											
		35 (32036237)		2											
		31 (26476503)		1											
		32 (19679285)		1											
		33 (12460863)		4											
		34 (18598895)		2											

US echocardiography transesophageal	May be appropriate (Disagreement)	Expert Opinion	0 0 mSv	0 0 mSv [ped]	5	5	0	0	2	0	3	6	2	1	0
		References		Study Quality											
		19 (26765302)		4											
		28 (36216604)		4											
		29 (16824834)		3											
		37 (32279620)		4											
		38 (2768712)		4											
CT chest with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3- 10 mSv [ped]	3	3	3	4	6	1	0	0	0	0	0
CT chest without IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3- 10 mSv [ped]	3	3	4	2	4	2	0	0	1	0	0
		References		Study Quality											
		18 (23926237)		4											
FDG-PET/CT heart	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3- 10 mSv [ped]	3	3	2	4	5	2	1	0	0	0	0
		References		Study Quality											
		28 (36216604)		4											
FDG-PET/MRI heart	Usually not appropriate	Limited	☼☼☼ 1-10 mSv		3	3	2	4	4	1	2	0	1	0	0
		References		Study Quality											
		3 (34081218)		4											
CTA coronary arteries with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3- 10 mSv [ped]	2	2	3	5	5	0	1	0	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3- 10 mSv [ped]	2	2	3	5	6	0	0	0	0	0	0
Arteriography coronary with ventriculography	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3- 10 mSv [ped]	2	2	6	4	1	0	2	0	0	0	0

85 (33419643)	2
84 (27904982)	4
81 (28138817)	4
80 (26552505)	4
82 (2131359)	4
83 (38502734)	2
73 (27236529)	3
76 (27146445)	2
79 (34545397)	4
74 (30084570)	2
78 (30616453)	2
77 (30551963)	2
75 (26838354)	4
72 (22002687)	4
71 (28092290)	4
40 (33629237)	4
5 (35347934)	4
48 (30337716)	3
68 (34825795)	4
46 (32040684)	3
30 (25129516)	3

CT heart function and morphology with IV contrast	Usually appropriate	Strong	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	8	8	0	0	0	1	0	1	4	7	1
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References	Study Quality
43 (27352354)	3
50 (35581366)	2
48 (30337716)	3
46 (32040684)	3
47 (25011535)	2
49 (23828946)	4
24 (22495682)	1

64 (34318397)	3
61 (31933156)	3
63 (22577239)	3
58 (31376028)	4
13 (23653245)	4
14 (35612548)	Good
59 (28390532)	4
60 (31807883)	3
46 (32040684)	3
45 (32563654)	3
3 (34081218)	4

FDG-PET/MRI heart	Usually appropriate	Limited	☹☹☹ 1-10 mSv		7	7	0	0	0	0	1	0	11	1	1
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References	Study Quality
70 (25552667)	2
69 (34476778)	3
68 (34825795)	4

MRI heart function and morphology without IV contrast	May be appropriate	Strong	○ ○ mSv	○ ○ mSv [ped]	6	6	0	0	1	1	3	4	3	1	0
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References	Study Quality
85 (33419643)	2
84 (27904982)	4
73 (27236529)	3
48 (30337716)	3
30 (25129516)	3

DOTATATE PET/CT skull base to mid-thigh	May be appropriate	Limited	☹☹☹ 1-10 mSv		5	5	0	2	0	3	4	3	1	0	0
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References	Study Quality
57 (25397775)	4
56 (34622428)	4
52 (22918770)	4

FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 3-10 mSv [ped]	3	3	0	3	8	0	1	2	0	0	0
		References		Study Quality											
		3 (34081218)		4											
		60 (31807883)		3											
		67 (31072171)		2											
		59 (28390532)		4											
		68 (34825795)		4											
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 1-10 mSv	☢☢☢☢☢ 3-10 mSv [ped]	2	2	3	5	4	2	0	0	0	0	0
MRA coronary arteries without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	5	4	4	1	0	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	3	6	5	0	0	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	4	5	5	0	0	0	0	0	0
MRA chest with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	4	4	6	0	0	0	0	0	0
MRI chest with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	4	5	5	0	0	0	0	0	0
Radiography chest	Usually not appropriate	Expert Consensus	☢ <0.1 mSv	☢ <0.03 mSv [ped]	1	1	12	0	0	2	0	0	0	0	0

Variant 3: Adult. Known cardiac mass. Established etiology. Follow-up imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI heart function and morphology without and with IV	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	8	8	0	0	0	2	0	0	3	4	4

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
contrast															
		References		Study Quality											
		5 (35347934)		4											
US echocardiography transthoracic resting	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	1	0	1	0	2	5	5
		References		Study Quality											
		89 (36610495)		3											
		33 (12460863)		4											
CT heart function and morphology with IV contrast	Usually appropriate	Moderate	⊗⊗⊗⊗ 10-30 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	7	7	0	0	0	0	0	0	11	3	0
		References		Study Quality											
		5 (35347934)		4											
		44 (26178177)		Good											
MRI heart function and morphology without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	2	1	1	7	2	0
		References		Study Quality											
		49 (23828946)		4											
		31 (26476503)		1											
FDG-PET/MRI heart	Usually appropriate	Limited	⊗⊗⊗ 1-10 mSv		7	7	0	0	0	0	1	5	6	1	1
		References		Study Quality											
		96 (28401505)		4											
US echocardiography transesophageal	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	2	5	6	1	0	0
		References		Study Quality											
		28 (36216604)		4											
		82 (2131359)		4											

FDG-PET/CT heart	May be appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 3-10 mSv [ped]	6	6	0	0	1	0	3	3	4	2	0
		References		Study Quality											
		95 (36995946)		4											
		13 (23653245)		4											
		8 (33040219)		4											
		5 (35347934)		4											
DOTATATE PET/CT skull base to mid-thigh	May be appropriate	Limited	☼☼☼ 1-10 mSv		5	5	1	0	0	4	6	2	1	0	0
		References		Study Quality											
		53 (30236163)		4											
		52 (22918770)		4											
		54 (31254038)		4											
CTA chest with IV contrast	Usually not appropriate	Moderate	☼☼☼ 1-10 mSv	☼☼☼☼☼ 3-10 mSv [ped]	3	3	0	4	5	0	3	1	1	0	0
		References		Study Quality											
		44 (26178177)		Good											
CTA coronary arteries with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼☼ 3-10 mSv [ped]	3	3	3	4	4	0	3	0	0	0	0
CT chest with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼☼ 3-10 mSv [ped]	3	3	4	2	8	0	0	0	0	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼☼ 3-10 mSv [ped]	3	3	5	1	2	3	1	0	1	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼☼ 3-10 mSv [ped]	3	3	4	3	7	0	0	0	0	0	0
Octreotide scan with SPECT or SPECT/CT chest and abdomen	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		3	3	4	2	1	2	3	0	1	0	0

FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 3-10 mSv [ped]	3	3	3	0	9	2	0	0	0	0	0
		References		Study Quality											
		29 (16824834)		3											
MRA coronary arteries without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	7	0	6	1	0	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	5	4	5	0	0	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	7	1	6	0	0	0	0	0	0
MRA chest with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	7	0	7	0	0	0	0	0	0
MRI chest with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	7	1	6	0	0	0	0	0	0
Arteriography coronary with ventriculography	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢☢ 3-10 mSv [ped]	1	1	8	1	3	1	0	0	0	0	0
Radiography chest	Usually not appropriate	Expert Consensus	☢ <0.1 mSv	☢ <0.03 mSv [ped]	1	1	9	2	1	0	1	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.