

**American College of Radiology
ACR Appropriateness Criteria®**

Dyspnea-Suspected Cardiac Origin (Ischemia Already Excluded)

Variant 1: Dyspnea due to suspected valvular heart disease. Ischemia excluded. 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	○ 0 mSv	○ 0 mSv [ped]	9	9	1	0	0	0	0	0	0	2	18
		References		Study Quality											
		54 (28330654)		2											
		61 (30826295)		4											
		57 (29420834)		4											
		59 (31260141)		4											
		21 (28586420)		4											
		58 (27539645)		3											
		53 (26847283)		4											
		23 (30834578)		4											
		52 (26275752)		4											
		55 (27354049)		2											
		51 (28864719)		3											
		49 (29346529)		2											
		56 (29794244)		3											
		60 (28117492)		3											
		50 (30376591)		3											
Radiography chest	Usually appropriate	Limited	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	7	7	0	0	0	1	0	1	16	4	0

		References	Study Quality												
		44 (27548877)	4												
MRI heart function and morphology without IV contrast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	2	4	12	3	1	0
		References	Study Quality												
		41 (27515954)	3												
		33 (27878504)	4												
		43 (31385360)	4												
		39 (28611119)	2												
		38 (30134000)	4												
		35 (26965931)	4												
		21 (28586420)	4												
		37 (26212514)	3												
		23 (30834578)	4												
		42 (30261961)	2												
		36 (31592729)	3												
		40 (26377908)	3												
		34 (29292243)	4												
		31 (22879371)	3												
		32 (25790878)	2												
MRI heart function and morphology without and with IV contrast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	0	6	13	3	0	0
		References	Study Quality												
		41 (27515954)	3												
		33 (27878504)	4												
		43 (31385360)	4												
		39 (28611119)	2												
		38 (30134000)	4												
		35 (26965931)	4												
		21 (28586420)	4												
		37 (26212514)	3												

23 (30834578)	4
42 (30261961)	2
36 (31592729)	3
40 (26377908)	3
34 (29292243)	4
31 (22879371)	3
32 (25790878)	2

US echocardiography transesophageal	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	4	6	11	1	0	0
-------------------------------------	--------------------	---------	---------	---------------	---	---	---	---	---	---	---	----	---	---	---

References	Study Quality
46 (30560601)	4
45 (27184953)	4
24 (29066081)	4
47 (28488097)	4

CT heart function and morphology with IV contrast	May be appropriate	Limited	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	2	2	2	8	6	0	0	1
---	--------------------	---------	----------------	---------------------	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
29 (27654407)	4
22 (25424562)	3
26 (30153438)	4
27 (27337529)	4
21 (28586420)	4
23 (30834578)	4
28 (32471541)	4
25 (29101983)	4

US echocardiography transthoracic stress	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	0	1	0	2	15	4	0	0	0
--	--------------------	---------	---------	---------------	---	---	---	---	---	---	----	---	---	---	---

References	Study Quality
21 (28586420)	4
62 (28395281)	4

CTA coronary arteries with IV contrast	Usually not appropriate	Limited	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	2	2	7	7	3	2	1	0	0	0	1
		References		Study Quality											
		25 (29101983)		4											
CT coronary calcium	Usually not appropriate	Limited	☹☹☹ 1-10 mSv		2	2	8	6	1	4	1	0	0	0	1
		References		Study Quality											
		20 (26188533)		3											
MRI heart function with stress without IV contrast	Usually not appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	2	2	6	9	3	1	1	0	0	0	1
MRI heart function with stress without and with IV contrast	Usually not appropriate	Expert Consensus	○ ○ mSv	○ ○ mSv [ped]	2	2	6	7	5	1	1	0	0	0	1
Arteriography coronary with ventriculography	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	14	5	0	0	0	0	1	0	1
FDG-PET/CT heart	Usually not appropriate	Expert Consensus	☹☹☹☹ 10-30 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	12	5	1	0	2	0	0	1	0
Rb-82 PET/CT heart	Usually not appropriate	Expert Consensus	☹☹☹☹ 10-30 mSv		1	1	14	4	2	0	0	0	0	0	1
SPECT or SPECT/CT MPI rest and stress	Usually not appropriate	Expert Consensus	☹☹☹☹ 10-30 mSv	☹☹☹☹☹ 10-30 mSv [ped]	1	1	12	5	1	0	1	1	0	0	1

Variant 2: Dyspnea due to suspected cardiac arrhythmia. Ischemia excluded. 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	○ ○ mSv	○ ○ mSv [ped]	8	8	2	0	0	0	0	1	3	5	10
		References		Study Quality											

83 (20172912)	4
87 (28882335)	3
94 (25735868)	3
91 (26833338)	3
92 (26467363)	2
95 (26864458)	2
89 (27252359)	2
96 (30387182)	1
93 (26321238)	1
90 (26164406)	2
97 (31347351)	3
98 (29523135)	4
88 (27334231)	3

MRI heart function and morphology without and with IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	1	0	3	4	3	6	4
--	---------------------	--------	---------	---------------	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
83 (20172912)	4
80 (28838961)	3
71 (26175568)	4
76 (27139734)	3
79 (28780194)	2
77 (31658247)	3
78 (30690570)	4
81 (31427780)	4
82 (28011840)	4
72 (29467354)	3
66 (31584472)	4

MRI heart function and morphology without IV contrast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	2	6	11	3	0	0
---	--------------------	--------	---------	---------------	---	---	---	---	---	---	---	----	---	---	---

References	Study Quality
83 (20172912)	4

80 (28838961)	3
71 (26175568)	4
76 (27139734)	3
79 (28780194)	2
77 (31658247)	3
78 (30690570)	4
81 (31427780)	4
82 (28011840)	4
72 (29467354)	3
66 (31584472)	4

CT heart function and morphology with IV contrast	May be appropriate	Strong	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	0	1	0	17	4	0	0	0
---	--------------------	--------	----------------	---------------------	---	---	---	---	---	---	----	---	---	---	---

References	Study Quality
64 (25559233)	1
63 (23992839)	3
67 (26897692)	3
65 (30129902)	3
28 (32471541)	4
66 (31584472)	4
69 (30402702)	2
68 (25713213)	3

Radiography chest	May be appropriate (Disagreement)	Expert Opinion	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	5	5	0	0	1	2	6	3	6	4	0
-------------------	-----------------------------------	----------------	------------	-------------------	---	---	---	---	---	---	---	---	---	---	---

US echocardiography transesophageal	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	4	4	1	4	5	3	6	1	0	0	1
-------------------------------------	--------------------	---------	---------	---------------	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
86 (28233335)	3

FDG-PET/CT heart	May be appropriate	Limited	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	4	4	0	0	1	11	5	5	0	0	0
------------------	--------------------	---------	----------------	---------------------	---	---	---	---	---	----	---	---	---	---	---

References	Study Quality
------------	---------------

		70 (30236394)			3										
US echocardiography transthoracic stress	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	3	3	4	4	3	4	4	0	2	0	0
CTA coronary arteries with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	2	2	9	5	3	0	2	0	1	0	1
MRI heart function with stress without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	7	9	1	2	1	0	0	0	1
MRI heart function with stress without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	7	7	2	1	2	0	0	0	2
SPECT or SPECT/CT MPI rest and stress	Usually not appropriate	Limited	⊗⊗⊗⊗ 10-30 mSv	⊗⊗⊗⊗⊗ 10-30 mSv [ped]	2	2	8	6	2	2	3	0	0	0	0

References	Study Quality
85 (27804074)	2
84 (27221816)	3

CT coronary calcium	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv		1	1	16	3	1	0	0	0	0	0	1
Arteriography coronary with ventriculography	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	1	1	13	4	2	0	1	0	0	1	0
Rb-82 PET/CT heart	Usually not appropriate	Expert Consensus	⊗⊗⊗⊗ 10-30 mSv		1	1	12	6	1	0	1	0	0	0	1

Variant 3: Dyspnea due to suspected pericardial disease. Ischemia excluded. 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	Limited	○ 0 mSv	○ 0 mSv [ped]	9	9	1	0	0	0	0	0	1	3	16

References	Study Quality
------------	---------------

102 (29025541)	4
110 (28315124)	4
106 (25672267)	2

CTA chest with IV contrast	May be appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	5	5	1	0	0	3	13	4	1	0	0
CT chest with IV contrast	May be appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	5	5	0	0	0	2	15	4	1	0	0
CT chest without IV contrast	May be appropriate	Limited	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	5	5	1	0	1	9	9	1	1	0	0

References	Study Quality
99 (30868443)	2

US echocardiography transesophageal	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	0	1	0	3	8	6	2	1	0
-------------------------------------	--------------------	---------	---------	---------------	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
102 (29025541)	4

FDG-PET/CT heart	May be appropriate (Disagreement)	Expert Opinion	⊗⊗⊗⊗ 10-30 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	5	5	2	1	8	2	6	3	0	0	0
------------------	-----------------------------------	----------------	----------------	---------------------	---	---	---	---	---	---	---	---	---	---	---

References	Study Quality
105 (31376028)	4
104 (28183513)	3

CTA coronary arteries with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	2	2	9	8	3	0	1	1	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	2	2	2	10	8	0	1	0	1	0	0
MRI heart function with stress without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	10	6	2	1	1	0	0	0	1
MRI heart function with stress without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	2	2	10	6	2	1	1	0	0	0	1

US echocardiography transthoracic stress	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	2	2	8	9	3	1	0	0	0	1	0
		References		Study Quality											
		111 (31202741)		4											
CT coronary calcium	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	13	4	2	1	0	0	0	0	1
Arteriography coronary with ventriculography	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	14	2	1	3	0	0	0	0	1
Rb-82 PET/CT heart	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	14	1	4	0	1	0	1	0	0
SPECT or SPECT/CT MPI rest and stress	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼☼ 10-30 mSv [ped]	1	1	14	3	3	0	0	0	0	1	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.