American College of Radiology
ACR Appropriateness Criteria®

Chest Pain-Possible Acute Coronary Syndrome

Variant 1: Chest pain, low to intermediate probability for acute coronary syndrome. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CTA coronary arteries with IV contrast	Usually appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	0	0	1	1	0	0	7	7

References	Study Quality
19 (17692738)	4
64 (17549487)	4
59 (17010819)	4
60 (19406338)	2
61 (17320744)	2
62 (17075011)	2
63 (17398185)	3
92 (24486266)	2
71 (22449295)	1
75 (23255742)	3
70 (22830462)	1
74 (23538167)	4
69 (21939822)	3
90 (22032711)	2
91 (22922562)	1
65 (26052677)	2
72 (22055795)	M

US echocardiography transthoracic stress	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	3	7	9	1	0

References	Study Quality
85 (24255127)	1
73 (19007693)	1
1 (28279382)	4
79 (27886161)	4
84 (27718140)	4
82 (28290782)	3
89 (27470449)	2
93 (27050025)	4
67 (27220653)	3
68 (27006119)	2
78 (26764061)	3
66 (26577263)	2
80 (26476506)	4
87 (25752898)	2
81 (25711274)	2
86 (23617513)	3
76 (25863305)	Inadequate
77 (25713467)	2
83 (22895647)	4
88 (28109933)	3
42 (12671809)	4
40 (27865485)	3
46 (26511125)	2
43 (24768667)	3
41 (25635106)	4
44 (17884363)	2
45 (21562726)	3
47 (20554154)	2

Radiography chest	Usually appropriate	Limited	☢ <0.1 mSv	☢ <0.03 mSv [ped]	7	7	0	0	0	1	1	2	8	6	2

References	Study Quality
31 (24595499)	2

SPECT or SPECT/CT MPI rest and stress	Usually appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	n/a	0	0	0	0	0	0	0	0	0

References	Study Quality
37 (24026478)	3
36 (23414823)	4
34 (14522503)	4
35 (23255769)	4
38 (21258084)	3
39 (22877811)	3

SPECT or SPECT/CT MPI rest and stress	Usually appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	7	7	1	0	0	1	2	0	7	4	1

References	Study Quality
37 (24026478)	3
36 (23414823)	4
34 (14522503)	4
35 (23255769)	4
38 (21258084)	3
39 (22877811)	3

US echocardiography transthoracic resting	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	5	5	2	0	2	2	9	1	0	0	0

References	Study Quality
51 (15215802)	2
57 (26349786)	3
48 (24745875)	4

54 (24612899)	4
41 (25635106)	4
49 (21111923)	4
50 (22014426)	2
52 (15917277)	3
53 (20159647)	4
55 (20185525)	3
56 (23582354)	3

MRI heart with function and vasodilator stress perfusion without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	3	9	7	0	1	0

References	Study Quality
111 (19787721)	2
110 (19772587)	4
114 (23664718)	2
119 (22196944)	3
113 (23578348)	4
112 (26268824)	2
45 (21562726)	3
118 (18381373)	4
117 (17868810)	3
120 (18208849)	2
121 (22992411)	4

Rb-82 PET/CT MPI rest and stress	May be appropriate (Disagreement)	Expert Opinion	☢☢☢☢ 10-30 mSv		5	n/a	0	0	0	0	0	0	0	0	0

References	Study Quality
109 (22554604)	M
108 (15937302)	3
105 (20660808)	1
106 (18342769)	Good
107 (19618180)	2

Rb-82 PET/CT MPI rest and stress	May be appropriate (Disagreement)	Expert Opinion	☢☢☢☢ 10-30 mSv		5	5	0	1	1	1	4	10	3	0	0

References	Study Quality
109 (22554604)	M
108 (15937302)	3
105 (20660808)	1
106 (18342769)	Good
107 (19618180)	2

SPECT or SPECT/CT MPI rest only	May be appropriate	Moderate	☢☢☢ 1-10 mSv		5	n/a	0	0	0	0	0	0	0	0	0

References	Study Quality
32 (14752467)	3
33 (12460092)	1
36 (23414823)	4
34 (14522503)	4
35 (23255769)	4

SPECT or SPECT/CT MPI rest only	May be appropriate	Moderate	☢☢☢ 1-10 mSv		5	5	0	1	0	2	10	4	3	0	0

References	Study Quality
32 (14752467)	3
33 (12460092)	1
36 (23414823)	4
34 (14522503)	4
35 (23255769)	4

CTA chest with IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	2	5	5	7	0	1	0	0

References	Study Quality
27 (17996512)	3
103 (27819965)	4
104 (26781150)	4

CT coronary calcium	May be appropriate	Moderate	☢☢☢ 1-10 mSv		4	4	3	2	2	3	6	0	0	0	0

References	Study Quality
94 (20360291)	2
99 (22825529)	4
100 (24513880)	3
97 (25937196)	4
98 (28390834)	4
95 (27765299)	Good
96 (22820732)	4

MRI heart function and morphology without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	1	1	3	6	8	1	0	0	0

References	Study Quality
111 (19787721)	2
110 (19772587)	4
124 (18678772)	2
122 (12566362)	2
131 (28005512)	4
129 (26590396)	3
123 (15582315)	2
125 (20510215)	4
126 (19332480)	4
127 (28645959)	4
128 (26146527)	4
130 (22309452)	3

MRI heart with function and inotropic stress without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	4	2	2	2	4	2	0	0	0

References	Study Quality
116 (20883929)	3
111 (19787721)	2

110 (19772587)	4
114 (23664718)	2
113 (23578348)	4
112 (26268824)	2
45 (21562726)	3
115 (20977757)	4

MRI heart with function and inotropic stress without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	0	2	1	9	6	1	0	1	0

References	Study Quality
116 (20883929)	3
111 (19787721)	2
110 (19772587)	4
114 (23664718)	2
113 (23578348)	4
112 (26268824)	2
45 (21562726)	3
115 (20977757)	4

CT chest with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	1	8	8	2	1	0	0	0	0

References	Study Quality
102 (26883335)	4
101 (27593539)	3

CT chest without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	5	3	4	2	2	0	0	0	0

References	Study Quality
102 (26883335)	4
101 (27593539)	3

MRI heart function and morphology without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	3	3	3	3	5	2	2	0	1	0	0

References	Study Quality

References	Study Quality
111 (19787721)	2
110 (19772587)	4
124 (18678772)	2
122 (12566362)	2
131 (28005512)	4
129 (26590396)	3
123 (15582315)	2
125 (20510215)	4
126 (19332480)	4
127 (28645959)	4
128 (26146527)	4
130 (22309452)	3

CT chest without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	7	2	0	0	0	0	1	0

References	Study Quality
102 (26883335)	4
101 (27593539)	3

Arteriography coronary	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		2	2	4	5	4	0	1	1	1	0	0

References	Study Quality
30 (26810814)	4

MRA coronary arteries without IV contrast	Usually not appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	2	2	5	10	5	0	0	0	0	0	0

References	Study Quality
132 (18586979)	4
119 (22196944)	3
133 (20513610)	4
134 (20828652)	2
135 (26965732)	4

MRA coronary arteries without and with IV contrast	Usually not appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	2	2	4	10	6	0	0	0	0	0	0

References	Study Quality
132 (18586979)	4
119 (22196944)	3
133 (20513610)	4
134 (20828652)	2
135 (26965732)	4

US echocardiography transesophageal	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	6	3	6	1	0	0	0	0	0

References	Study Quality
58 (15556822)	4

Variant 2: Chest pain, high probability for acute coronary syndrome. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Arteriography coronary	Usually appropriate	Strong	☢☢☢ 1-10 mSv		9	9	0	0	0	0	0	0	3	5	8

References	Study Quality
7 (22923432)	4
136 (9103133)	4
137 (19393152)	4
138 (23247304)	4
139 (25260718)	4
140 (23395074)	4
141 (20045278)	2
142 (19458363)	1
143 (18594042)	Good

Radiography chest	Usually appropriate	Limited	☢ <0.1 mSv	☢ <0.03 mSv [ped]	7	7	0	0	0	1	2	0	9	6	2

References	Study Quality
31 (24595499)	2

MRI heart function and morphology without and with IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	0	2	4	2	8	2	1	1	0

References	Study Quality
145 (25782462)	3
125 (20510215)	4
126 (19332480)	4
127 (28645959)	4
128 (26146527)	4
144 (20117357)	4

US echocardiography transthoracic resting	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	5	5	0	0	2	2	11	4	1	0	0

References	Study Quality
51 (15215802)	2
57 (26349786)	3
48 (24745875)	4
54 (24612899)	4
41 (25635106)	4
49 (21111923)	4
50 (22014426)	2
52 (15917277)	3
53 (20159647)	4
55 (20185525)	3
56 (23582354)	3

US echocardiography transthoracic stress	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	1	2	6	2	6	1	2	0	0

SPECT or SPECT/CT MPI rest only	May be appropriate (Disagreement)	Expert Opinion	☢☢☢ 1-10 mSv		5	n/a	0	0	0	0	0	0	0	0	0
SPECT or SPECT/CT MPI rest only	May be appropriate (Disagreement)	Expert Opinion	☢☢☢ 1-10 mSv		5	5	3	1	4	4	5	2	1	0	0
CTA coronary arteries with IV contrast	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	4	4	5	6	1	0	0	0
SPECT or SPECT/CT MPI rest and stress	May be appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	4	n/a	0	0	0	0	0	0	0	0	0

References	Study Quality
146 (17174181)	1
147 (10080466)	1

SPECT or SPECT/CT MPI rest and stress	May be appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	4	4	0	2	3	10	3	1	1	0	0

References	Study Quality
146 (17174181)	1
147 (10080466)	1

CTA chest with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	2	4	7	5	1	0	1	0	0

References	Study Quality
27 (17996512)	3
103 (27819965)	4

CT chest with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	3	5	5	1	2	0	0	0	0

References	Study Quality
102 (26883335)	4
101 (27593539)	3

MRI heart function and morphology without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	3	5	2	1	4	1	0	0	0

References	Study Quality
145 (25782462)	3
125 (20510215)	4
126 (19332480)	4
127 (28645959)	4
128 (26146527)	4
144 (20117357)	4

CT coronary calcium	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		2	2	8	2	3	1	1	1	0	0	0
CT chest without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	3	5	0	1	0	0	0	0

References	Study Quality
102 (26883335)	4
101 (27593539)	3

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

References	Study Quality
102 (26883335)	4
101 (27593539)	3

MRA coronary arteries without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	6	5	4	0	0	0	0	1	0
MRA coronary arteries without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	6	4	5	0	0	0	0	1	0
US echocardiography transesophageal	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	7	2	7	0	0	0	0	0	0

References	Study Quality
58 (15556822)	4

MRI heart with function and vasodilator stress perfusion without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	7	3	3	1	0	0	2	0	0
MRI heart with function and inotropic stress without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	8	2	3	1	0	0	2	0	0
Rb-82 PET/CT MPI rest and stress	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv		2	n/a	0	0	0	0	0	0	0	0	0
Rb-82 PET/CT MPI rest and stress	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv		2	2	7	8	2	2	1	0	0	0	0
MRI heart with function and inotropic stress without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	2	3	0	0	1	1	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.**