

American College of Radiology ACR Appropriateness Criteria®

Imaging of Mediastinal Masses

Variant 1: Clinically suspected mediastinal mass. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT chest with IV contrast	Usually appropriate	Strong	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	9	9	0	0	0	0	0	1	1	2	8
			References	Study Quality											
			48 (18373824)	3											
			45 (16028243)	3											
			24 (25575742)	2											
			41 (23820175)	2											
			43 (19820808)	4											
			40 (9308448)	4											
			42 (30887749)	2											
			44 (8134583)	4											
			46 (11128398)	2											
			47 (19945190)	2											
			49 (27494286)	4											
			50 (2916014)	4											
			51 (25798006)	4											
			52 (10988179)	2											
CT chest without IV contrast	Usually appropriate	Strong	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	7	7	0	0	0	0	4	2	6	1	0
			References	Study Quality											

48 (18373824)	3
45 (16028243)	3
41 (23820175)	2
43 (19820808)	4
25 (28238381)	4
40 (9308448)	4
42 (30887749)	2
44 (8134583)	4
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2

MRI chest without IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	3	3	2	2	3
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References	Study Quality
70 (24177751)	2
48 (18373824)	3
45 (16028243)	3
60 (1410337)	4
67 (24157619)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
24 (25575742)	2
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4

22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2
62 (22707094)	4
63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
66 (30951437)	4
68 (22786993)	4
71 (24877982)	2
72 (12100322)	4
73 (10730236)	4
78 (25556605)	4
83 (7862995)	2
84 (11368935)	4

MRI chest without and with IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	1	0	8	0	4
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References	Study Quality
70 (24177751)	2
48 (18373824)	3
45 (16028243)	3
60 (1410337)	4
80 (17145404)	3
67 (24157619)	4

69 (29324329)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
24 (25575742)	2
61 (25105246)	2
110 (25518038)	4
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4
22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4
23 (25478741)	1
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2
62 (22707094)	4
63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
66 (30951437)	4
68 (22786993)	4
71 (24877982)	2
72 (12100322)	4

48 (18373824)	3
45 (16028243)	3
41 (23820175)	2
43 (19820808)	4
25 (28238381)	4
40 (9308448)	4
42 (30887749)	2
44 (8134583)	4
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2

Image-guided transthoracic needle biopsy	Usually not appropriate	Expert Consensus	Varies		1	1	9	1	1	0	0	0	1	0	0
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Variant 2: Indeterminate mediastinal mass on radiography. Next imaging study.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT chest with IV contrast	Usually appropriate	Strong	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	9	9	0	0	0	0	0	0	0	1	11

References	Study Quality
48 (18373824)	3
45 (16028243)	3
24 (25575742)	2
41 (23820175)	2
43 (19820808)	4
40 (9308448)	4

42 (30887749)	2
44 (8134583)	4
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2

MRI chest without and with IV contrast	Usually appropriate	Strong	0 mSv	0 mSv [ped]	8	8	0	0	1	0	2	1	2	1	5
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References	Study Quality
70 (24177751)	2
48 (18373824)	3
45 (16028243)	3
60 (1410337)	4
80 (17145404)	3
69 (29324329)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
24 (25575742)	2
61 (25105246)	2
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4
22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4

46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2
63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
71 (24877982)	2
72 (12100322)	4
73 (10730236)	4
78 (25556605)	4
100 (31464819)	4
81 (18637703)	4
82 (20705944)	3
83 (7862995)	2
84 (11368935)	4

CT chest without IV contrast	Usually appropriate	Strong	⊗⊗⊗ 1-10 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	7	7	0	0	0	0	1	1	8	3	0
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References	Study Quality
48 (18373824)	3
45 (16028243)	3
24 (25575742)	2
41 (23820175)	2
43 (19820808)	4
40 (9308448)	4
42 (30887749)	2
44 (8134583)	4
46 (11128398)	2
47 (19945190)	2

49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2

MRI chest without IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	2	2	3	4	2
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References	Study Quality
70 (24177751)	2
60 (1410337)	4
80 (17145404)	3
69 (29324329)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
24 (25575742)	2
61 (25105246)	2
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4
22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2

63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
71 (24877982)	2
72 (12100322)	4
73 (10730236)	4
78 (25556605)	4
100 (31464819)	4
81 (18637703)	4
82 (20705944)	3
83 (7862995)	2
84 (11368935)	4

US chest	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	3	3	4	0	5	2	1	0	0	0	0
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References	Study Quality
89 (30027639)	4
90 (25881598)	1

FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Strong	⊗⊗⊗⊗ 10-30 mSv	⊗⊗⊗⊗ 3-10 mSv [ped]	2	2	3	5	5	0	0	0	0	0	0
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References	Study Quality
95 (29720487)	2
53 (29437755)	2
96 (28634685)	4
56 (28123154)	3
94 (27130796)	1
98 (24724780)	4
55 (26272529)	2
92 (26089397)	4
93 (25205600)	2
91 (24799481)	2
99 (20639307)	4

70 (24177751)	2
60 (1410337)	4
67 (24157619)	4
69 (29324329)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
24 (25575742)	2
61 (25105246)	2
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4
22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4
25 (28238381)	4
46 (11128398)	2
47 (19945190)	2
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2
62 (22707094)	4
63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
66 (30951437)	4
68 (22786993)	4
71 (24877982)	2

72 (12100322)	4
73 (10730236)	4
78 (25556605)	4
100 (31464819)	4
83 (7862995)	2
84 (11368935)	4

MRI chest without IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	1	2	2	2	4	1
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References	Study Quality
70 (24177751)	2
48 (18373824)	3
45 (16028243)	3
60 (1410337)	4
80 (17145404)	3
67 (24157619)	4
69 (29324329)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
24 (25575742)	2
61 (25105246)	2
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4
22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4
25 (28238381)	4

46 (11128398)	2
47 (19945190)	2
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2
62 (22707094)	4
63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
66 (30951437)	4
68 (22786993)	4
71 (24877982)	2
72 (12100322)	4
73 (10730236)	4
78 (25556605)	4
100 (31464819)	4
81 (18637703)	4
82 (20705944)	3
83 (7862995)	2
84 (11368935)	4

Image-guided transthoracic needle biopsy	May be appropriate	Strong	Varies		6	6	0	0	0	1	4	3	2	2	0
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References	Study Quality
109 (26402427)	4
108 (29581992)	2
111 (26604114)	3
102 (26397325)	4
103 (25763320)	4
110 (25518038)	4
106 (25261906)	4
104 (24263776)	2

			105 (22039020)		1													
			101 (25978277)		4													
			107 (20938161)		2													
FDG-PET/CT skull base to mid-thigh	May be appropriate	Strong	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	6	6	0	0	0	1	4	2	3	2	0			
			References		Study Quality													
			95 (29720487)		2													
			53 (29437755)		2													
			96 (28634685)		4													
			56 (28123154)		3													
			94 (27130796)		1													
			98 (24724780)		4													
			55 (26272529)		2													
			92 (26089397)		4													
			93 (25205600)		2													
			91 (24799481)		2													
			99 (20639307)		4													
			57 (19501523)		2													
			42 (30887749)		2													
			97 (25841712)		4													
			54 (19443604)		4													
US chest	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	2	2	6	2	1	1	1	1	0	0	0			
			References		Study Quality													
			89 (30027639)		4													
			90 (25881598)		1													
Radiography chest	Usually not appropriate	Expert Consensus	☼ <0.1 mSv	☼ <0.03 mSv [ped]	1	1	9	2	0	1	0	0	0	0	0			

Variant 4: Indeterminate mediastinal mass on FDG-PET/CT. Next imaging study.

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

References	Study Quality
70 (24177751)	2
48 (18373824)	3
45 (16028243)	3
60 (1410337)	4
80 (17145404)	3
67 (24157619)	4
69 (29324329)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
61 (25105246)	2
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4
22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4
25 (28238381)	4
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4

51 (25798006)	4
52 (10988179)	2
62 (22707094)	4
63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
66 (30951437)	4
68 (22786993)	4
71 (24877982)	2
72 (12100322)	4
73 (10730236)	4
78 (25556605)	4
100 (31464819)	4
81 (18637703)	4
82 (20705944)	3
83 (7862995)	2
84 (11368935)	4

Image-guided transthoracic needle biopsy	Usually appropriate	Strong	Varies		7	7	0	0	0	0	4	1	3	3	1
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References	Study Quality
109 (26402427)	4
108 (29581992)	2
111 (26604114)	3
102 (26397325)	4
103 (25763320)	4
110 (25518038)	4
106 (25261906)	4
104 (24263776)	2
105 (22039020)	1
101 (25978277)	4
107 (20938161)	2

MRI chest without IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	1	3	1	2	5	0
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References	Study Quality
70 (24177751)	2
48 (18373824)	3
45 (16028243)	3
60 (1410337)	4
80 (17145404)	3
67 (24157619)	4
69 (29324329)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
61 (25105246)	2
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4
22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4
25 (28238381)	4
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2
62 (22707094)	4

63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
66 (30951437)	4
68 (22786993)	4
71 (24877982)	2
72 (12100322)	4
73 (10730236)	4
78 (25556605)	4
100 (31464819)	4
81 (18637703)	4
82 (20705944)	3
83 (7862995)	2
84 (11368935)	4

CT chest with IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕⊕ 3-10 mSv [ped]	6	6	0	0	0	1	3	6	3	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕⊕ 3-10 mSv [ped]	2	2	5	3	2	0	0	1	1	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕⊕ 3-10 mSv [ped]	2	2	6	5	1	0	1	0	0	0	0
US chest	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	2	2	6	2	2	0	1	1	0	0	0
			References	Study Quality											
			89 (30027639)	4											
			90 (25881598)	1											
Radiography chest	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	1	1	9	1	1	0	1	0	0	0	0

Variant 5: Indeterminate mediastinal mass on MRI. Next imaging study or surveillance.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Image-guided transthoracic needle biopsy	Usually appropriate	Strong	Varies		8	8	0	0	0	0	2	1	2	2	5

References	Study Quality
109 (26402427)	4
108 (29581992)	2
111 (26604114)	3
102 (26397325)	4
103 (25763320)	4
110 (25518038)	4
106 (25261906)	4
104 (24263776)	2
105 (22039020)	1
101 (25978277)	4
107 (20938161)	2

MRI chest without and with IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	1	1	3	4	4	0
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References	Study Quality
70 (24177751)	2
48 (18373824)	3
45 (16028243)	3
60 (1410337)	4
80 (17145404)	3
67 (24157619)	4
69 (29324329)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
24 (25575742)	2

61 (25105246)	2
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4
22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4
25 (28238381)	4
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4
50 (2916014)	4
51 (25798006)	4
52 (10988179)	2
62 (22707094)	4
63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
66 (30951437)	4
68 (22786993)	4
71 (24877982)	2
72 (12100322)	4
73 (10730236)	4
78 (25556605)	4
100 (31464819)	4
81 (18637703)	4
82 (20705944)	3
83 (7862995)	2

		84 (11368935)		4													
CT chest with IV contrast	May be appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	6	6	0	0	0	0	5	7	1	0	0		
MRI chest without IV contrast	May be appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	0	1	5	1	5	1	0		

References	Study Quality
70 (24177751)	2
48 (18373824)	3
45 (16028243)	3
60 (1410337)	4
80 (17145404)	3
67 (24157619)	4
69 (29324329)	4
79 (29143106)	2
55 (26272529)	2
21 (25952512)	4
24 (25575742)	2
61 (25105246)	2
77 (24646161)	4
76 (22573298)	4
75 (21940535)	4
20 (21700977)	4
59 (20462094)	4
22 (17463136)	2
74 (16282916)	4
58 (25950727)	4
19 (2117345)	4
25 (28238381)	4
46 (11128398)	2
47 (19945190)	2
49 (27494286)	4

50 (2916014)	4
51 (25798006)	4
52 (10988179)	2
62 (22707094)	4
63 (24555628)	3
64 (3753623)	4
65 (27449453)	4
66 (30951437)	4
68 (22786993)	4
71 (24877982)	2
72 (12100322)	4
73 (10730236)	4
78 (25556605)	4
100 (31464819)	4
81 (18637703)	4
82 (20705944)	3
83 (7862995)	2
84 (11368935)	4

FDG-PET/CT skull base to mid-thigh	May be appropriate	Strong	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	6	6	0	1	0	2	0	5	3	1	0
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References	Study Quality
95 (29720487)	2
53 (29437755)	2
96 (28634685)	4
56 (28123154)	3
94 (27130796)	1
98 (24724780)	4
55 (26272529)	2
92 (26089397)	4
93 (25205600)	2
91 (24799481)	2

99 (20639307)	4
57 (19501523)	2
42 (30887749)	2
97 (25841712)	4
54 (19443604)	4

CT chest without IV contrast	May be appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	5	5	0	0	1	0	7	4	1	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	6	5	0	0	1	0	1	0	0
US chest	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	7	3	1	0	0	1	0	0	0
Radiography chest	Usually not appropriate	Expert Consensus	☼ <0.1 mSv	☼ <0.03 mSv [ped]	1	1	8	3	0	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.