

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

**Workup of Noncerebral Systemic Arterial Embolic Source**

**Variant 1: Known upper extremity arterial occlusion. Suspected embolic etiology. Next imaging study to determine source.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT heart function and morphology with IV contrast	Usually appropriate	Strong	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	8	8	0	0	0	0	0	0	4	13	0

References	Study Quality
40 (25018846)	4
39 (10992020)	4
38 (19179202)	2
37 (31738598)	4
36 (29555833)	2
35 (22342878)	4
34 (29374188)	2
33 (29330651)	3
32 (25751618)	2
31 (23821020)	2
30 (26178177)	Good
29 (29961869)	Good
28 (23406625)	Good
27 (19356536)	1
26 (26341605)	4
25 (30801566)	1
24 (28740038)	2





11 (21145267)	4
16 (19251175)	4
17 (22723539)	4

US duplex Doppler abdomen	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	11	4	0	1	1	0	0	0	0
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**Variante 2: Known arterial occlusion in the mesenteric or renal arterial system or renal infarcts. Suspected embolic etiology. Next imaging study to determine source.**

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 0 mSv	0 0 mSv [ped]	8	8	0	0	0	1	0	0	4	10	2

References	Study Quality
54 (1987242)	1
53 (16946152)	3
49 (26476503)	1
46 (16824834)	3
52 (27256218)	4
2 (25747606)	3

CTA chest with IV contrast	Usually appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	7	7	0	0	0	0	0	3	13	0	0
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References	Study Quality
13 (21529769)	4
12 (29150083)	2
41 (10966185)	4

CTA chest and abdomen with IV contrast	Usually appropriate	Limited	⊕⊕⊕⊕ 10-30 mSv		7	7	2	0	0	0	0	0	8	7	0
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References	Study Quality
57 (19770313)	4
56 (21482138)	4

13 (21529769)	4
12 (29150083)	2
41 (10966185)	4

CT heart function and morphology with IV contrast	Usually appropriate	Strong	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	7	7	0	0	0	0	0	0	10	7	0
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References	Study Quality
40 (25018846)	4
39 (10992020)	4
38 (19179202)	2
37 (31738598)	4
36 (29555833)	2
35 (22342878)	4
34 (29374188)	2
33 (29330651)	3
32 (25751618)	2
31 (23821020)	2
30 (26178177)	Good
29 (29961869)	Good
28 (23406625)	Good
27 (19356536)	1
26 (26341605)	4
25 (30801566)	1
24 (28740038)	2
23 (29218612)	2
22 (20809409)	2
21 (27601228)	2
20 (22495682)	1
19 (21757676)	1
18 (19366905)	1

MRA chest and abdomen without and with IV contrast	Usually appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	7	7	0	0	0	0	0	1	12	4	0
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References	Study Quality
44 (17285264)	2
43 (20013276)	3
58 (24935911)	2
57 (19770313)	4
56 (21482138)	4

MRI heart function and morphology without IV contrast	Usually appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	1	6	8	2	0
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References	Study Quality
49 (26476503)	1
45 (29374292)	Good

MRI heart function and morphology without and with IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	0	1	11	5	0
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References	Study Quality
48 (23793590)	4
47 (17313647)	4
46 (16824834)	3
45 (29374292)	Good
39 (10992020)	4
37 (31738598)	4
29 (29961869)	Good

US echocardiography transesophageal	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	0	3	12	2	0
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References	Study Quality
51 (23186295)	4
50 (31236074)	3
46 (16824834)	3
31 (23821020)	2
13 (21529769)	4
10 (19995630)	4
4 (24523417)	3









21 (27601228)	2
20 (22495682)	1
19 (21757676)	1
18 (19366905)	1

MRA chest without and with IV contrast	Usually appropriate	Limited	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	0	5	11	0	0
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References	Study Quality
44 (17285264)	2
43 (20013276)	3

MRA chest abdomen pelvis without and with IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	0	2	12	3	0
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References	Study Quality
58 (24935911)	2
57 (19770313)	4
56 (21482138)	4
44 (17285264)	2
43 (20013276)	3

MRI heart function and morphology without IV contrast	Usually appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	0	0	3	11	3	0
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References	Study Quality
49 (26476503)	1
45 (29374292)	Good

US echocardiography transesophageal	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	1	0	0	3	11	2	0
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References	Study Quality
51 (23186295)	4
50 (31236074)	3
46 (16824834)	3
31 (23821020)	2
13 (21529769)	4
10 (19995630)	4



Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT heart function and morphology with IV contrast	Usually appropriate	Strong	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	8	8	0	0	0	0	0	0	3	11	3
			References	Study Quality											
			40 (25018846)												
			39 (10992020)												
			38 (19179202)												
			37 (31738598)												
			36 (29555833)												
			35 (22342878)												
			34 (29374188)												
			33 (29330651)												
			32 (25751618)												
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			23 (29218612)												
			22 (20809409)												
			21 (27601228)												
			20 (22495682)												
			19 (21757676)												
			18 (19366905)												
MRI heart function and morphology without and with IV contrast	Usually appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	8	8	0	0	0	0	0	0	4	12	1

References	Study Quality
48 (23793590)	4
47 (17313647)	4
46 (16824834)	3
45 (29374292)	Good
39 (10992020)	4
37 (31738598)	4
29 (29961869)	Good

US echocardiography transthoracic resting	Usually appropriate	Strong	0 mSv	0 mSv [ped]	8	8	0	0	0	0	1	0	3	10	3
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References	Study Quality
54 (1987242)	1
53 (16946152)	3
49 (26476503)	1
46 (16824834)	3
52 (27256218)	4
2 (25747606)	3

CTA chest with IV contrast	Usually appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	7	7	0	0	0	0	1	3	9	4	0
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References	Study Quality
13 (21529769)	4
41 (10966185)	4
12 (29150083)	2

CTA chest abdomen pelvis with IV contrast	Usually appropriate	Limited	☼☼☼☼☼ 30-100 mSv		7	7	2	0	0	0	0	0	8	6	1
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References	Study Quality
57 (19770313)	4
56 (21482138)	4
13 (21529769)	4
12 (29150083)	2
41 (10966185)	4



46 (16824834)	3
31 (23821020)	2
13 (21529769)	4
10 (19995630)	4
4 (24523417)	3
2 (25747606)	3

MRA chest without IV contrast	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	6	6	0	0	0	0	3	9	4	1	0
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References	Study Quality
44 (17285264)	2
43 (20013276)	3

US duplex Doppler abdomen	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	4	4	4	2	2	3	6	0	0	0	0
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References	Study Quality
56 (21482138)	4

## **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](http://www.acr.org/ac).