

American College of Radiology ACR Appropriateness Criteria®

Acute Trauma to the Ankle

Variant 1: Adult or child 5 years of age or older. Acute trauma to the ankle or acute trauma to the ankle with persistent pain for more than 1 week but less than 3 weeks. No exclusionary criteria present. Initial imaging. Patient meets the requirements for evaluation by the Ottawa Ankle Rules which are positive: 1.Inability to bear weight immediately after the injury, OR 2.Point tenderness over the medial malleolus, the posterior edge or inferior tip of the lateral malleolus, talus, or calcaneus, OR 3.Inability to ambulate for 4 steps in the emergency department.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography ankle	Usually appropriate	Strong	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	9	9	0	0	0	0	0	0	0	0	17

References	Study Quality
31 (10845508)	3
15 (12595378)	4
32 (19834751)	4
40 (17785745)	3
37 (17613502)	4
36 (15827363)	2
8 (19187397)	Good
38 (28673281)	3
14 (28764972)	4
33 (27465987)	4
13 (26691309)	4
35 (26265187)	4
34 (26190779)	4
39 (25036414)	4
30 (23646202)	3

CT ankle with IV contrast	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	⊕⊕ 0.03-0.3 mSv [ped]	1	1	15	0	2	0	0	0	0	0	0
CT ankle without IV contrast	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	⊕⊕ 0.03-0.3 mSv [ped]	1	1	12	1	0	4	0	0	0	0	0
CT ankle without and with IV contrast	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	⊕⊕ 0.03-0.3 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
MRI ankle without IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	15	0	0	2	0	0	0	0	0
		References	Study Quality												
		29 (27888851)	4												
MRI ankle without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0
		References	Study Quality												
		29 (27888851)	4												
Bone scan ankle	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
US ankle	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	15	1	0	1	0	0	0	0	0
		References	Study Quality												
		41 (24942618)	4												

Variant 2: Adult or child 5 years of age or older. Acute trauma to the ankle. No exclusionary criteria present (eg, neurologically intact (including no peripheral neuropathy)). Patient meets the requirements for evaluation by the Ottawa Ankle Rules which are negative: No point tenderness over the malleoli, talus, or calcaneus on physical examination. Able to walk. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT ankle with IV contrast	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	⊕⊕ 0.03-0.3 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0

		41 (24942618)		4											
CT ankle with IV contrast	Usually not appropriate	Limited	⊕ <0.1 mSv	⊕⊕ 0.03-0.3 mSv [ped]	1	1	14	0	0	0	2	0	1	0	0
		References		Study Quality											
		42 (26922668)		4											
		41 (24942618)		4											
CT ankle without and with IV contrast	Usually not appropriate	Limited	⊕ <0.1 mSv	⊕⊕ 0.03-0.3 mSv [ped]	1	1	15	0	0	1	0	0	1	0	0
		References		Study Quality											
		42 (26922668)		4											
		41 (24942618)		4											
MRI ankle without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	13	1	2	1	0	0	0	0	0
MRI ankle without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	15	1	1	0	0	0	0	0	0
Bone scan ankle	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
US ankle	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0
Radiography ankle stress views	Usually not appropriate	Expert Consensus	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	1	1	16	1	0	2	0	0	0	0	0

Variant 4: Adult or child 5 years of age or older. Acute trauma to the ankle with persistent pain for more than 1 week but less than 3 weeks. No exclusionary criteria present. Initial radiographs negative. Next study.

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

		References		Study Quality													
		53 (23334625)		4													
		55 (25920051)		3													
		50 (26244618)		4													
		29 (27888851)		4													
		51 (27467862)		4													
		52 (25895834)		3													
		54 (24753239)		3													
		CT ankle without IV contrast	Usually appropriate	Limited	☼ <0.1 mSv	☼☼ 0.03-0.3 mSv [ped]	7	7	0	0	0	0	4	3	3	3	4
		References		Study Quality													
		43 (7717229)		3													
		44 (8810692)		3													
		47 (21316885)		4													
		48 (15333345)		3													
		45 (12533393)		4													
		49 (11858605)		4													
		46 (21343690)		4													
Radiography ankle	May be appropriate	Limited	☼ <0.1 mSv	☼ <0.03 mSv [ped]	5	5	1	0	1	4	10	1	2	0	0		
		References		Study Quality													
		37 (17613502)		4													
Radiography ankle stress views	May be appropriate	Expert Consensus	☼ <0.1 mSv	☼ <0.03 mSv [ped]	5	5	0	0	0	2	10	5	2	0	0		
US ankle	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	3	3	6	1	2	2	5	0	1	0	0		
		References		Study Quality													
		58 (19181977)		4													
		57 (23773880)		4													
		56 (25023100)		4													

		41 (24942618)														
CT ankle with IV contrast	Usually not appropriate	Limited	☢ <0.1 mSv	☢☢ 0.03-0.3 mSv [ped]	1	1	15	0	2	0	0	0	0	0	0	0
		References	Study Quality													
		43 (7717229)	3													
		44 (8810692)	3													
		47 (21316885)	4													
		48 (15333345)	3													
		45 (12533393)	4													
		49 (11858605)	4													
		46 (21343690)	4													
CT ankle without and with IV contrast	Usually not appropriate	Limited	☢ <0.1 mSv	☢☢ 0.03-0.3 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0	0
		References	Study Quality													
		43 (7717229)	3													
		44 (8810692)	3													
		47 (21316885)	4													
		48 (15333345)	3													
		45 (12533393)	4													
		49 (11858605)	4													
		46 (21343690)	4													
MRI ankle without and with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	15	1	1	0	0	0	0	0	0	0
		References	Study Quality													
		53 (23334625)	4													
		55 (25920051)	3													
		50 (26244618)	4													
		29 (27888851)	4													
		51 (27467862)	4													
		52 (25895834)	3													

Radiography ankle Broden's view	May be appropriate	Expert Consensus	☼ <0.1 mSv	☼ <0.03 mSv [ped]	5	5	0	1	0	1	9	7	1	0	0
CT ankle with IV contrast	Usually not appropriate	Limited	☼ <0.1 mSv	☼☼ 0.03-0.3 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0

References	Study Quality
60 (19531659)	4
48 (15333345)	3
59 (22859663)	3
61 (26517167)	4
62 (26043240)	4

CT ankle without and with IV contrast	Usually not appropriate	Limited	☼ <0.1 mSv	☼☼ 0.03-0.3 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
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References	Study Quality
60 (19531659)	4
48 (15333345)	3
59 (22859663)	3
61 (26517167)	4
62 (26043240)	4

MRI ankle without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
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References	Study Quality
64 (17656737)	4
58 (19181977)	4
63 (23465947)	4
55 (25920051)	3
66 (25539277)	3
57 (23773880)	4
56 (25023100)	4
65 (28374052)	4
61 (26517167)	4

CT ankle without IV contrast	Usually appropriate	Limited	☼ <0.1 mSv	☼☼ 0.03-0.3 mSv [ped]	7	7	0	0	0	1	4	2	5	4	1
		References	Study Quality												
		69 (27623865)	3												
		71 (28419034)	4												
		70 (24177591)	4												
CT ankle with IV contrast	Usually not appropriate	Limited	☼ <0.1 mSv	☼☼ 0.03-0.3 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
		References	Study Quality												
		69 (27623865)	3												
		71 (28419034)	4												
		70 (24177591)	4												
CT ankle without and with IV contrast	Usually not appropriate	Limited	☼ <0.1 mSv	☼☼ 0.03-0.3 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
		References	Study Quality												
		69 (27623865)	3												
		71 (28419034)	4												
		70 (24177591)	4												
MRI ankle without and with IV contrast	Usually not appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	1	1	16	0	1	0	0	0	0	0	0
		References	Study Quality												
		71 (28419034)	4												
		51 (27467862)	4												
		52 (25895834)	3												
Bone scan ankle	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
US ankle	Usually not appropriate	Limited	○ ○ mSv	○ ○ mSv [ped]	1	1	12	2	1	1	1	0	0	0	0
		References	Study Quality												

75 (25682406)	3
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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.