American College of Radiology ACR Appropriateness Criteria $^{\circledR}$

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.

D 1	Appropriateness	COF	A L L DDI	B 1 BB1	D (1	3.5.11			F	inal [Гаbu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography ankle	Usually appropriate	Strong	३ < 0.1 mSv		9	9	0	0	0	0	0	0	0	0	17

[pod]
Study Quality
3
4
4
3
4
2
Good
3
4
4
4
4
4
4
3

CT ankle with IV contrast	Usuall approp	Expert Consensus	 	v 0.03- 0.3 mSv [ped]	1	1	15	0	2	0	0	0	0	0	0
CT ankle without IV contrast	Usuall approp	Expert Consensus	≎ <0.1 mS	♥♥ 0.03- v 0.3 mSv [ped]	1	1	12	1	0	4	0	0	0	0	0
CT ankle without and with IV contrast	Usuall approp	Expert Consensus	≎ <0.1 mS	v 0.03- 0.3 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
MRI ankle without IV contrast	Usuall approp	Limited	O 0 mSv	O 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	Usuall approp	Limited	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0
		References		Study	/ Quality										
		29 (27888851)			4										
Bone scan ankle	Usuall approp	Expert Consensus	≎≎≎ 1-10 mSv	⊕⊕⊕⊕ 3- 10 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
US ankle	Usuall approp	Limited	O 0 mSv	O 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.

	Appropriateness	GOT.	A L L DDY	n i nni	D .:	3.6.11			F	inal '	Гabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	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

CT ankle without IV contrast	Usually not appropriate	Expert Consensus	≎ <0.1 mSv	�� 0.03- 0.3 mSv [ped]	1	1	16	0	0	1	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	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	0	1	0	0	0	0	0
MRI ankle without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	17	0	0	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	O 0 mSv	O 0 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
Radiography ankle	Usually not appropriate	Expert Consensus	ᢒ <0.1 mSv		1	1	16	1	0	0	1	1	0	0	0

Variant 3: Adult or child 5 years of age or older. Acute trauma to the ankle. Exclusionary criteria are present (eg, neurologic disorder, neuropathy, or other). Patient does not meet requirements for evaluation by the Ottawa Ankle Rules. Initial imaging.

ъ	Appropri	iateness	COF	4 1 14 DD	. T	D I DDI	D 41	3.7.11			F	inal '	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RR	KL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography ankle	Usua approp		Limited	≎ <0.1 mS	Sv		9	9	0	0	0	0	0	0	0	1	16
			References			Study	Quality										
			25 (9774943)				4										
CT ankle without IV contrast	May approp		Limited	≎ <0.1 mS	Sv	�� 0.03- 0.3 mSv [ped]	5	5	1	0	2	5	7	3	1	0	0
			References			Study	Quality										
			42 (26922668)				4										

		41 (24942618)			4										
CT ankle with IV contrast	Usuall approp	Limited	 <0.1 mS	v 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	Usuall approp	Limited	⊕ <0.1 mS	v 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	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	2	1	0	0	0	0	0
MRI ankle without and with IV contrast	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	1	1	0	0	0	0	0	0
Bone scan ankle	Usuall approp	Expert Consensus	��� 1-10 mSv	●●●● 3- 10 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
US ankle	Usuall approp	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0
Radiography ankle stress views	Usuall approp	Expert Consensus	 <0.1 mS		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.

D 1	Appropriateness	COF	A L L DDI	D I DDI	D 4	3.6.11			F	inal '	Гаbu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI ankle without IV contrast	Usually appropriate	Limited	O 0 mSv	O 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	Usua approp	ally oriate	Limited	� <0.1 mS	Sv 0.3	0.03- mSv ed]	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 approp	be oriate	Limited	� <0.1 mS	Sv m	0.03 Sv ed]	5	5	1	0	1	4	10	1	2	0	0
			References			Study	Quality										
			37 (17613502)				4										
Radiography ankle stress views	May approp		Expert Consensus	� <0.1 mS	Sv m	0.03 Sv ed]	5	5	0	0	0	2	10	5	2	0	0
US ankle	Usually approp		Limited	O 0 mSv		mSv ed]	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)			4										
CT ankle with IV contrast	Usually not appropriate	Limited	⊕ <0.1 mSv		1	1	15	0	2	0	0	0	0	0	0
		References		Stud	y 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
		References		Stud	y Quality										
		43 (7717229)			3										
		44 (8810692)			3										
		47 (21316885)			4										
		48 (15333345)			3										
		45 (12533393)			4										
		49 (11858605)			4										
		46 (21343690)			4						1	1			
MRI ankle without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	15	1	1	0	0	0	0	0	0
		References		Stud	y Quality										
		53 (23334625)			4										
		55 (25920051)			3										
		50 (26244618)			4										
		29 (27888851)			4]								
		51 (27467862)			4]								
		52 (25895834)			3										

		54 (24753239)			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

Variant 5: Adult or child 5 years of age or older. Acute trauma to the ankle. No exclusionary criteria present. Radiographs demonstrate fracture or potential osteochondral injury. Next study.

D 1	Appropriateness	COF	A L I/ DDI	D I DDI	D 4	N. 11			I	inal	Tabı	ılatio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT ankle without IV contrast	Usually appropriate	Limited	⊕ <0.1 mSv	�� 0.03- 0.3 mSv [ped]	9	9	0	0	0	0	1	2	2	1	11
		References		Study	Quality										
		60 (19531659)			4										
		48 (15333345)			3										
		59 (22859663)			3										
		61 (26517167)			4										
		62 (26043240)		_	4						1	1			
MRI ankle without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	1	2	3	11
		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										
		22 (25743919)			4										

Radiography ankle Broden's view	May be appropriate	Expert Consensus	≎ <0.1 mSv		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			y Quality		'			•					
		60 (19531659)			4										
		48 (15333345)			3										
		59 (22859663)	ı		3										
		61 (26517167)	1		4										
_		62 (26043240)	<u> </u>		4										
CT ankle without and with IV contrast	Usually not appropriate	Limited	 	�� 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)													
		59 (22859663)													
		61 (26517167)			4										
		62 (26043240)			4										
MRI ankle without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	17	0	0	0	0	0	0	0	0
		References		Study	y Quality										
		64 (17656737)			4										
		58 (19181977)	ı		4										
		63 (23465947)			4										
		55 (25920051)		3											
		66 (25539277)		3											
		57 (23773880)	1												
		56 (25023100)													
		65 (28374052)													
		61 (26517167)			4										

			22 (25743919)			4										
Bone scan ankle	Usuall approp		Expert Consensus	��� 1-10 mSv	0	1	1	16	0	1	0	0	0	0	0	0
US ankle	Usuall approp	-	Limited	O 0 mSv	O 0 mSv [ped]	1	1	14	0	1	1	0	1	0	0	0
			References 41 (24942618)		Study											

Variant 6: Adult or child 5 years of age or older. Acute trauma to the ankle. Radiographs negative for osseous injury and physical examination or radiographs demonstrate alignment abnormality suggesting syndesmotic/ligamentous injury or dislocation. Next study.

	Appropri	ateness	GOT		_	D 1 DD1	- ·	36.11	Final Tabulations								
Procedure	dure Appropriateness SOE Adults RRL Peds RRL Ratio	Rating	Median	1	2	3	4	5	6	7	8	9					
MRI ankle without IV contrast	Usua approp		Limited O 0 mSv		,	O 0 mSv [ped]	9	9	0	0	0	0	0	1	0	1	15
			References		Study Quality												
			71 (28419034)		4												
			51 (27467862)														
			52 (25895834)				3										
Radiography leg	Usua approp		Limited	⊕ <0.1 mS	Sv		8	8	0	0	0	0	3	0	6	6	4
			References		Study Quality												
			74 (23079149)				4										
Radiography ankle stress views	Usua approp		Limited	≎ <0.1 mS	Sv		8	8	0	0	0	1	2	0	4	7	5
		References			Study	Quality											
		73 (24296599)					4										
			72 (23955557)				3										

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											
		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											
		69 (27623865)			3										
		71 (28419034)			4										
		70 (24177591)			4										
MRI ankle without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	0
		References		Study											
		71 (28419034)													
		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	O 0 mSv	O 0 mSv [ped]	1	1	12	2	1	1	1	0	0	0	0
		References		Study									_		

75 (25682406)	2
/3 (23062 4 00)] 3

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.