American College of Radiology ACR Appropriateness Criteria®

Rib Fractures

Variant 1: Suspected rib fractures from minor blunt trauma (injury confined to ribs). Initial imaging.

	Appropriateness			Final Tabulati											
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6		8	9
Radiography chest	Usually appropriate	Strong	≎ <0.1 mSv		8	8	0	0	0	0	0	0	0	0	0
		References		Study	y Quality										
		2 (12013289)			4										
		9 (20171819)			2										
		1 (15100544)			2										
Radiography rib views	May be appropriate	Strong	��� 1-10 mSv		5	5	0	0	0	0	0	0	0	0	0
		References		Study	y Quality										
		12 (25690384)			1										
		11 (24648235)			3										
		10 (24297110)			2										
CT chest without IV contrast	Usually not appropriate	Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	3	3	0	0	0	0	0	0	0	0	0
		References		Study	y Quality										
		16 (26683395)		2											
		13 (23796979)			3										
		19 (16261391)			4										
		22 (9314299)			3										

							1								
		14 (27389132)			2		l								
		17 (9148976)			4										
		18 (9282178)			3										
		15 (18404055)			4										
		20 (9095103)			3										
		21 (3562831)			2										
		23 (8147647)			4										
		24 (20549285)			4										
		25 (2672391)			4										
Bone scan whole body	Usually not appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	2	2	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		30 (7261514)			4										
		32 (12592121)			4										
		31 (536788)			4										
CT chest with IV contrast	Usually not appropriate	Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	0	0	0	0	0		0	0	
		References		Study	Quality										
		13 (23796979)			3										
		19 (16261391)			4										
		22 (9314299)			3		l								
		18 (9282178)			3										
		2 (12013289)			4										
		15 (18404055)			4										
		4 (12853057)			4										
		20 (9095103)			3										
		21 (3562831)			2										
		23 (8147647)			4										
	1						ł								
		24 (20549285)			4		ļ								

CT chest without and with IV contrast	Usually approp	y not oriate	Strong	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	0	0	0	0	0	0	0	0	0
			References		Study	Quality										
			16 (26683395)			2										
			13 (23796979)			3										
			19 (16261391)			4										
			22 (9314299)			3										
			14 (27389132)			2										
			17 (9148976)			4										
			18 (9282178)			3										
			15 (18404055)			4										
			20 (9095103)			3										
			21 (3562831)			2										
			23 (8147647)			4										
			24 (20549285)			4										
			25 (2672391)			4										
US chest	Usually approp	y not oriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	0	0	0	0	0	0	0	0	0
			References		Study	Quality										
			26 (14500082)			4										
			28 (10584808)			3										
			27 (11159088)			4										
			29 (15135274)			3										

Variant 2: Suspected rib fractures after cardiopulmonary resuscitation (CPR). Initial imaging.

	Appropriateness	SOF	A J14. DDI	D. J. DDI	D - 45	3.6.11			F	inal '	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	Usually appropriate	Strong	ଡ <0.1 mSv		8	8	0	0	0	0	0	0	0	0	0

			References		Study	Quality										
			34 (15036733)			4										
			33 (21705131)			2										
			35 (24525116)		C	Good										
Radiography rib views	May approp		Expert Consensus	��� 1-10 mSv	0	5	5	0	0	0	0	0	0	0	0	0
CT chest without IV contrast	May approp		Limited	��� 1-10 mSv	0	4	4	1	2	2	5	3	0	0	0	0
			References		Study	Quality										
			33 (21705131)		2											
CT chest with IV contrast	Usually approp		Limited	發發發 1-10 mSv	0	2	2	0	0	0	0	0	0	0	0	0
			References		Study	Quality										
			33 (21705131)			2										
Bone scan whole body	Usually approp		Expert Consensus	發發發 1-10 mSv	0	2	2	0	0	0	0	0	0	0	0	0
US chest	Usually approp	y not oriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	0	0	0	0	0	0	0	0	0
			References		Study	Quality										
			28 (10584808)			3										
CT chest without and with IV contrast	Usually approp		Limited	⊕⊕⊕ 1-10 mSv	0	1	1	0	0	0	0	0	0	0	0	0
			References		Study	Quality										
			33 (21705131)			2										

Variant 3: Suspected pathologic rib fracture. Initial imaging.

	Appropriateness	907	4.1.4. DD7	D 1 DD1	.	3.5 31			F	inal	Tabu	latio	ıs		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	Usually appropriate	Limited	 <0.1 mSv		8	8	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		38 (27498118) 4 37 (10492357) 2													
		36 (23017193)			3										
CT chest without IV contrast	Usually appropriate	Limited	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	7	7	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		36 (23017193)			3										
Bone scan whole body	Usually appropriate	Limited	��� 1-10 mSv		7	7	0	0	0	0	0	0	0	0	0
		References		Study		•									
		30 (7261514)			4										
FDG-PET/CT skull base to mid-thigh	May be appropriate	Limited	���⊕ 10-30 mSv	≎≎≎≎ 3- 10 mSv [ped]	5	5	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		37 (10492357)			2										
		36 (23017193)			3			_	_						
Radiography rib views	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		5	5	0	0	0	0	0	0	0	0	0
CT chest with IV contrast	Usually not appropriate	Limited	��� 1-10 mSv		2	2	0	0	0	0	0	0	0	0	0
		References		Study	Quality										
		36 (23017193)			3										

CT chest without and with IV contrast	Usuall approp	y not oriate	Limited	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	0	0	0	0	0	0	0	0	0
			References			Study Quality											
			36 (23017193)	3													
US chest	Usuall approp	y not oriate	not Limited		,	O 0 mSv [ped]	1	1	0	0	0	0	0	0	0	0	0
			References														
			38 (27498118)			4											
			37 (10492357)			2											
			36 (23017193)				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.