American College of Radiology ACR Appropriateness Criteria®

Acute Respiratory Illness in Immunocompetent Patients

Variant 1: Acute respiratory illness in immunocompetent patients with negative physical examination, normal vital signs and no other risk factors. Initial imaging.

	Appropri	ateness	GOE		Adults RRL Peds RRL Rating Median ⊕ <0.03 mSv ped]		3.6.11			F	inal	Tabu	latio	ns		
Procedure	Categ	ory	SOE	Adults RR	L Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	Usual appropr		Moderate	� <0.1 mS	Sv mSv	7	7	0	0	0	1	2	2	1	2	3
			References		Stud	y Quality		-								
			23 (16635092)			4										
			21 (7455106)			4										
			22 (3718128)			3										
			24 (17412152)			2										
			25 (25785179)			2										
			26 (18439380)													
			27 (18439353)			4										
			28 (9224224)		4											
CT chest with IV contrast	Usually		Expert Consensus		10 mSv	2	2	5	4	3	0	0	0	0	0	0
CT chest without IV contrast	Usually		Expert Consensus	Expert ��� 1-10		2	2	3	5	4	0	0	0	0	0	0
US chest	Usually		Strong O 0 mSv		[ped] O 0 mSv [ped]	2	2	3	4	4	0	0	0	0	0	0
			References		Study Quality				•							
			8 (24184011)		3											

			9 (21030550)				2							
			10 (25758182)				2							
			11 (22700780)				3							
CT chest without and with IV contrast	Usuall approp		Expert Consensus	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	6	2	2	1	0	
MRI chest without IV contrast	Usuall	v not	Expert			O 0 mSv	_							

Expert Consensus

Expert Consensus

Usually not appropriate

Usually not appropriate

MRI chest without and with IV

contrast

Variant 2:	Acute respiratory illnesses in immunocompetent patients with positive physical examination, abnormal vital signs, organic brain disease or other risk factors. Initial
	imaging.

O 0 mSv

O 0 mSv

O 0 mSv [ped]

O 0 mSv [ped]

	Appropri	gory				- ·				F	'inal	Tabu	latio	ns			
Procedure	Categ	gory	SOE	Adults RR	(L	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	Usua approp		Moderate	≎ <0.1 mS	Sv		9	9	0	0	0	0	0	0	1	3	7
			References			Study	Quality										
			23 (16635092)				4										
			4 (17278083) 21 (7455106)				4										
			21 (7455106)				4										
			22 (3718128)				3										
			31 (16837505)				3										
			29 (17099198)				4										
			30 (15336579)				4										
			24 (17412152)		2												
			24 (17412152) 25 (25785179)				2										
US chest	May approp	be riate	Limited	O 0 mSv	/	O 0 mSv [ped]	4	4	2	0	3	2	3	1	0	0	0
	.	References				Study	Quality										

8 (24184011)	3
11 (22700780)	3

CT chest without IV contrast	Usually not appropriate	Expert Consensus	ଫଫଫ 1-10 mSv	���� 3- 10 mSv [ped]	3	3	1	4	4	1	1	0	1	0	0
CT chest with IV contrast	Usually not appropriate	Expert Consensus	୫୫୫ 1-10 mSv	���� 3- 10 mSv [ped]	2	2	3	5	2	1	0	1	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	ଫଫଫ 1-10 mSv	���� 3- 10 mSv [ped]	2	2	5	1	3	1	1	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	7	4	1	0	0	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	8	3	1	0	0	0	0	0	0

Variant 3: Acute respiratory illness in immunocompetent patients with positive physical examination, abnormal vital signs, organic brain disease, or other risk factors and negative or equivocal initial chest radiograph. Next Imaging Study.

D 1	Appropriateness	COF	A L L DDI	D 1 DD1	D (1	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
CT chest without IV contrast	Usually appropriate	Moderate	≎≎≎ 1-10 mSv	≎≎≎≎ 3- 10 mSv [ped]	7	7	0	0	0	0	2	2	2	1	4

References	Study Quality
4 (17278083)	4
24 (17412152)	2
32 (18571356)	4
6 (26935360)	2
7 (26168322)	3
33 (25083953)	3
34 (2785179)	1

CT chest with IV contrast	May be appropriate (Disagreement)	Expert Opinion	��� 1-10 mSv	222 2 3- 10 mSv [ped]	5	5	0	0	4	0	1	2	3	2	0
		References		Study	Quality										
		4 (17278083)		_	4										
		24 (17412152)			2										
		32 (18571356)			4										
		6 (26935360)			2										
		7 (26168322)			3										
		33 (25083953)			3										
		34 (2785179)			1										
US chest	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	4	4	1	0	4	3	2	0	1	0	0
		References		Study	Quality										
		8 (24184011)			3										
		10 (25758182)			2										
		11 (22700780)			3										
MRI chest without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	3	6	2	1	0	0	0	0	0
		References		Study	Quality							•			
		14 (27811069)			1										
MRI chest without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	5	3	1	2	0	1	0	0	0
		References		Study	Quality										
		14 (27811069)			1										
CT chest without and with IV contrast	Usually not appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	1	1	7	2	1	1	1	0	0	0	0
		References		Study	/ Quality										
		4 (17278083)			4										
		24 (17412152)			2										
		32 (18571356)			4										

6 (26935360)	2
7 (26168322)	3
33 (25083953)	3
34 (2785179)	1

Variant 4: Acute respiratory illnesses in immunocompetent patients with pneumonia complicated by suspected parapneumonic effusion or abscess on initial chest radiograph. Next Imaging study.

ъ. 1	Appropriateness	COF	A L L DDI	⊕ 1 10					F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT chest with IV contrast	Usually appropriate	Limited	��� 1-10 mSv	���� 3- 10 mSv [ped]	8	8	0	0	0	0	2	2	0	3	4
		References		Study	Quality										
		35 (7384467)			4										
		6 (26935360)			2										
CT chest without IV contrast	Usually appropriate	Limited	mited		7	7	0	0	0	0	1	3	3	2	2
		References		Study	Quality										
		35 (7384467)			4										
		6 (26935360)		2			_								
MRI chest without IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	3	0	0	5	2	2	0	0	0
		References		Study	Quality										
		16 (27641778)			2										
		14 (27811069)			1		_								
MRI chest without and with IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped] 5		5	3	0	0	4	2	3	0	0	0
		References		Study	Quality		_								
		16 (27641778)			2										

			14 (27811069)			1			_	_						
US chest	May approp		Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	0	6	2	3	0	0
			References		Study Quality 4											
		36 (26218493) 4														
CT chest without and with IV contrast	Usuall approp	y not oriate	Limited	��� 1-1 mSv			5	3	2	1	0	0	1	0	0	
			References		Study Quality											
			35 (7384467)		4											
			6 (26935360)		2											

Variant 5: Acute asthma exacerbation in immunocompetent patients, uncomplicated (no suspicion of pneumonia or pneumothorax). Initial imaging.

Duran Janua	Appropri	iateness	SOF	A .J14 D.D).T	D. J. DDI	D - 45	M - 1!			F	inal '	Гаbu	latio	ns		
Procedure	Categ		SOE	Adults RR	KL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	May approp		Limited	≎ <0.1 mS	Sv		6	6	0	0	1	0	5	1	3	1	1
			References			Study	Quality										
			37 (7297142)				4										
			22 (3718128)				3										
CT chest with IV contrast	Usuall approp		Expert Consensus	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	2	2	3	4	1	2	0	1	0	0	0
CT chest without IV contrast	Usuall approp		Expert Consensus	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	2	2	4	3	2	1	1	1	0	0	0
US chest	Usuall approp	-	Expert Consensus	O 0 mSv	v	O 0 mSv [ped]	2	2	5	3	2	0	1	0	0	0	0
CT chest without and with IV contrast	Usuall approp		Expert Consensus	��� 1-1 mSv	0	���� 3- 10 mSv [ped]	1	1	6	3	2	0	0	0	0	0	0

MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	1	0	0	1	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	2	0	0	1	0	0	0	0

Variant 6: Acute asthma exacerbation in immunocompetent patients, complicated (suspected pneumonia or pneumothorax). Initial imaging.

	Appropri	iateness	207				1			F	inal	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RR	L Peds RI	L Rating	Median	1	2	3	4	Tabulations 5 6 7 8 0 3 0 2 4 1 1 0 7 3 1 0 2 1 0 0	9			
Radiography chest	Usua approp		Limited	⊕ <0.1 mS		3 9	9	0	0	0	0	0	3	0	2	6
			References		S											
			37 (7297142)			4										
			22 (3718128)			3										
			38 (7237908)			3										
			39 (2060333)			4										
CT chest with IV contrast	May approp		Expert Consensus	��� 1-10 mSv	0 \$\$\$\$ 10 mS [ped]		5	0	1	3	1	4	1	1	0	0
CT chest without IV contrast	May approp		Expert Consensus	��� 1-10 mSv	0 \$\$\$\$ 10 mS [ped]		5	0	0	0	0	7	3	1	0	1
US chest	May approp		Strong	O 0 mSv	O 0 mS [ped]	v 4	4	3	0	2	3	2	1	0	0	0
			References		S	tudy Quality					•					
			8 (24184011)			3										
			9 (21030550)			2										

References	Study Quality
8 (24184011)	3
9 (21030550)	2
10 (25758182)	2
11 (22700780)	3
12 (20731700)	2
13 (17316468)	4

CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	୫୫୫ 1-10 mSv	���� 3- 10 mSv [ped]	3	3	4	1	4	2	0	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	6	2	1	1	1	1	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	6	2	1	1	1	1	0	0	0

Variant 7: Acute COPD exacerbation in immunocompetent patients, uncomplicated (no chest pain, fever, or leukocytosis, no history of coronary artery disease, or heart failure). Initial imaging.

	Appropriateness	COL	4.1.14 DD1		D 41	3.5.11			F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRI	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography chest	Usually appropriate	Limited	⊕ <0.1 mS		8	8	0	0	0	1	2	0	2	2	4
		References		Study	Quality										
		40 (2818109)			4										
CT chest with IV contrast	May be appropriate	Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	4	4	3	1	1	2	3	1	0	0	0
CT chest without IV contrast	May be appropriate	Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	4	4	2	1	3	4	1	1	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	≎≎≎ 1-10 mSv	���� 3- 10 mSv [ped]	2	2	5	2	2	2	0	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	8	2	1	1	0	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	8	2	1	1	0	0	0	0	0
US chest	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	6	1	3	0	0	1	0	0	0

Variant 8: Acute COPD exacerbation in immunocompetent patients with accompanying chest pain, fever, or leukocytosis, or a history of coronary artery disease, or heart failure. Initial imaging.

	Appropr	oriateness SOF Adul			SOE Adults RRL Peds RRL Rating Median								S COP ALL DE DIEDE DE SE								Final Tab											
Procedure	Categ		SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9																
Radiography chest	Usua approp		Limited	≎ <0.1 mSv		9	9	0	0	0	0	0	0	1	3	7																
	•		References		Study	Quality																										
			40 (2818109)		-	4																										
CT chest without IV contrast	May approp		Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	6	6	0	0	1	0	2	4	2	1	1																
CT chest with IV contrast	May approp		Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	5	5	0	0	1	0	7	1	3	0	0																
US chest	May approp		Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	2	3	5	1	0	0	0																
			References		Study	/ Quality																										
			10 (25758182)			2																										
	_		11 (22700780)			3																										
CT chest without and with IV contrast	Usuall approp		Expert Consensus	��� 1-10 mSv	���� 3- 10 mSv [ped]	3	3	4	0	3	0	3	1	0	0	0																
MRI chest without IV contrast	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	7	2	1	1	0	1	0	0	0																
MRI chest without and with IV contrast	Usuall approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	7	2	1	1	0	1	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.