

**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.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography chest	Usually appropriate	Moderate	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	7	7	0	0	0	1	2	2	1	2	3
		References		Study Quality											
		21 (7455106)		4											
		22 (3718128)		3											
		23 (16635092)		4											
		24 (17412152)		2											
		25 (25785179)		2											
		26 (18439380)		4											
		27 (18439353)		4											
		28 (9224224)		4											
CT chest with IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	2	2	5	4	3	0	0	0	0	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	2	2	3	5	4	0	0	0	0	0	0
US chest	Usually not appropriate	Strong	○ 0 mSv	○ 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	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	6	2	2	1	0	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	9	3	0	0	0	0	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	10	2	0	0	0	0	0	0	0

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

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

References	Study Quality
4 (17278083)	4
21 (7455106)	4
22 (3718128)	3
23 (16635092)	4
24 (17412152)	2
25 (25785179)	2
29 (17099198)	4
30 (15336579)	4
31 (16837505)	3

US chest	May be appropriate	Limited	○ 0 mSv	○ 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	⊕⊕⊕ 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	⊕⊕⊕ 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	⊕⊕⊕ 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	○ 0 mSv	○ 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	○ 0 mSv	○ 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.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							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
6 (26935360)	2
7 (26168322)	3
32 (18571356)	4
33 (25083953)	3
34 (2785179)	1
24 (17412152)	2

CT chest with IV contrast	May be appropriate (Disagreement)	Expert Opinion	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	5	6	0	0	4	0	1	2	3	2	0
		References	Study Quality												
		4 (17278083)	4												
		6 (26935360)	2												
		7 (26168322)	3												
		24 (17412152)	2												
		32 (18571356)	4												
		33 (25083953)	3												
		34 (2785179)	1												
US chest	May be appropriate	Limited	○ 0 mSv	○ 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	○ 0 mSv	○ 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	○ 0 mSv	○ 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												
		6 (26935360)	2												
		7 (26168322)	3												

32 (18571356)	4
33 (25083953)	3
34 (2785179)	1
24 (17412152)	2

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

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							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												
		6 (26935360)	2												
		35 (7384467)	4												
CT chest without IV contrast	Usually appropriate	Limited	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	7	7	0	0	0	0	1	3	3	2	2
		References	Study Quality												
		6 (26935360)	2												
		35 (7384467)	4												
MRI chest without IV contrast	May be appropriate (Disagreement)	Expert Opinion	○ 0 mSv	○ 0 mSv [ped]	5	4	3	0	0	5	2	2	0	0	0
		References	Study Quality												
		14 (27811069)	1												
		16 (27641778)	2												
MRI chest without and with IV contrast	May be appropriate (Disagreement)	Expert Opinion	○ 0 mSv	○ 0 mSv [ped]	5	4	3	0	0	4	2	3	0	0	0
		References	Study Quality												
		14 (27811069)	1												



MRI chest without IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 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	○ 0 mSv	○ 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.**

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

References	Study Quality
22 (3718128)	3
37 (7297142)	4
38 (7237908)	3
39 (2060333)	4

CT chest with IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	1	3	1	4	1	1	0	0
CT chest without IV contrast	May be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	0	0	0	7	3	1	0	1
US chest	May be appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	4	4	3	0	2	3	2	1	0	0	0

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	☼☼☼ 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	○ 0 mSv	○ 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	○ 0 mSv	○ 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.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography chest	Usually appropriate	Limited	☼ <0.1 mSv	☼ <0.03 mSv [ped]	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	○ 0 mSv	○ 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	○ 0 mSv	○ 0 mSv [ped]	1	1	8	2	1	1	0	0	0	0	0
US chest	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 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.**

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography chest	Usually appropriate	Limited	⊕ <0.1 mSv	⊕ <0.03 mSv [ped]	9	9	0	0	0	0	0	0	1	3	7
		References		Study Quality											
		40 (2818109)		4											
CT chest without IV contrast	May be appropriate	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 be appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	5	5	0	0	1	0	7	1	3	0	0
US chest	May be appropriate	Limited	○ 0 mSv	○ 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	Usually not appropriate	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	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	7	2	1	1	0	1	0	0	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 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](http://www.acr.org/ac).