American College of Radiology
ACR Appropriateness Criteria®

Acute Respiratory Illness in Immunocompetent Patients

Variant 1: Adult. Acute respiratory illness in immunocompetent patients with negative physical examination, normal vital signs, and no other risk factors for poor outcome. 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	May be appropriate (Disagreement)	Expert Opinion	☢ <0.1 mSv	☢ <0.03 mSv [ped]	5	5	0	0	1	2	5	3	2	1	3

References	Study Quality
15 (16635092)	4
16 (17278083)	4
13 (7455106)	4
14 (3718128)	3
11 (17412152)	2
10 (25785179)	2
18 (27793503)	2
17 (-3198008)	4

CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	9	3	2	2	1	0	1	0	0
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	2	1	0	1	2	0	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	10	2	3	0	1	1	1	0	0

CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	14	2	1	0	1	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	2	1	0	0	0	0	0	1
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	1	0	0	0	0	0	1	0
V/Q scan lung	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	13	1	2	1	0	0	1	0	0
US chest	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	11	4	2	0	0	0	0	0	0

References	Study Quality
19 (24184011)	3
20 (21030550)	2
21 (25758182)	2
22 (22700780)	3

Variant 2: Adult. Acute respiratory illness in immunocompetent patients with positive physical examination, or abnormal vital signs, or organic brain disease, or other risk factors for poor outcome. 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	Strong	☢ <0.1 mSv	☢ <0.03 mSv [ped]	9	9	1	0	0	0	0	0	1	4	12

References	Study Quality
15 (16635092)	4
16 (17278083)	4
13 (7455106)	4
14 (3718128)	3
29 (16837505)	3

27 (17099198)	4
28 (15336579)	4
11 (17412152)	2
10 (25785179)	2
18 (27793503)	2
30 (33124905)	4

CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	3	4	9	1	0	0	0	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	5	2	7	2	1	0	0	0	0
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	6	4	0	0	0	0	0	0
US chest	Usually not appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	2	2	8	6	2	1	0	0	0	0	0

References	Study Quality
19 (24184011)	3
22 (22700780)	3
31 (34515247)	2

CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	13	0	2	1	1	1	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	2	0	0	1	0	1	0
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	1	0	0	0	0	0	1
V/Q scan lung	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	14	2	0	0	0	1	0	0	0

Variant 3: Adult. Acute respiratory illness in immunocompetent patients with positive physical examination, abnormal vital signs, organic brain disease, or other risk factors and negative or indeterminate 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	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	1	0	0	1	3	4	5	4

References	Study Quality
16 (17278083)	4
32 (18571356)	4
34 (23083885)	3
35 (26935360)	2
40 (26168322)	3
37 (25083953)	3
8 (31685101)	4
36 (22498759)	2
12 (32729811)	4
30 (33124905)	4
31 (34515247)	2
39 (32770367)	2
38 (27103390)	4

CT chest without IV contrast	Usually appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	0	0	1	0	0	7	3	7

References	Study Quality
16 (17278083)	4
32 (18571356)	4
34 (23083885)	3
35 (26935360)	2
40 (26168322)	3
37 (25083953)	3
12 (32729811)	4
30 (33124905)	4

		31 (34515247)		2											
CTA chest with IV contrast	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	1	3	9	3	1	0	0
MRI chest without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	8	2	3	2	2	0	1	0	0
		References		Study Quality											
		51 (18519226)		4											
		50 (21105134)		4											
		41 (34037828)		4											
US chest	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	2	2	7	5	3	2	0	0	0	0	0
		References		Study Quality											
		19 (24184011)		3											
		20 (21030550)		2											
		21 (25758182)		2											
		22 (22700780)		3											
		9 (20731700)		2											
		54 (17316468)		4											
		30 (33124905)		4											
		52 (33806432)		1											
		53 (33635443)		2											
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	11	4	1	0	0	0	1	0	0
MRI chest without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	9	5	3	0	0	0	0	0	0
		References		Study Quality											
		42 (27641778)		2											
		44 (24189389)		1											
		46 (17943326)		2											
		43 (27811069)		1											

45 (18726093)	4
47 (26546472)	2
48 (21816896)	3
49 (32491257)	2
41 (34037828)	4

V/Q scan lung	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	13	2	2	0	0	0	0	0	0

Variant 4: Adult. Acute respiratory illness 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	1	1	0	0	1	2	5	8

References	Study Quality
55 (7384467)	4

CT chest without IV contrast	Usually appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	7	0	0	1	1	3	4	3	3	3

References	Study Quality
55 (7384467)	4

US chest	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	1	5	8	1	1	1	0

References	Study Quality
22 (22700780)	3
54 (17316468)	4
58 (26218493)	4

CTA chest with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	3	3	4	3	6	3	1	0	0	0	0

		References		Study Quality											
		56 (29916720)		2											
MRI chest without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	4	2	4	2	4	0	1	1	0
		References		Study Quality											
		57 (2312846)		2											
		50 (21105134)		4											
		41 (34037828)		4											
MRI chest without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	2	2	5	8	2	2	0	0	0	0	0
		References		Study Quality											
		57 (2312846)		2											
		50 (21105134)		4											
		41 (34037828)		4											
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	11	1	3	1	0	1	0	0	1
V/Q scan lung	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	13	2	2	0	0	1	0	0	0

Variant 5: Adult. Acute asthma exacerbation in immunocompetent patients, uncomplicated. 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	May be appropriate	Limited	☢ <0.1 mSv	☢ <0.03 mSv [ped]	6	6	0	0	0	2	6	4	3	0	2
		References		Study Quality											
		59 (7297142)		4											
		14 (3718128)		3											

CT chest without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	9	3	1	2	1	1	0	1	0
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	13	1	1	2	1	0	0	0	0
CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	11	1	3	2	0	0	1	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	15	1	0	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	15	2	0	0	0	0	0	0	1
MRI chest 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	1	0
V/Q scan lung	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	15	0	2	0	0	0	1	0	0
US chest	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	0	1	0	0	2	0	0	0

Variant 6: Adult. Acute asthma exacerbation in immunocompetent patients, complicated. 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	1	0	1	0	0	1	1	3	11

References	Study Quality
59 (7297142)	4
14 (3718128)	3
62 (7237908)	3
61 (2060333)	4

CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	10	1	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	5	5	3	1	2	1	0	0	0
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	10	2	2	0	3	0	1	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	1	1	3	1	0	0	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	4	0	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	14	0	2	0	0	0	0	1	1
V/Q scan lung	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	14	1	2	0	0	0	1	0	0
US chest	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	1	1	9	6	2	0	0	0	0	0	0

References	Study Quality
19 (24184011)	3
20 (21030550)	2
21 (25758182)	2
22 (22700780)	3
9 (20731700)	2
54 (17316468)	4

Variant 7: Adult. Acute COPD exacerbation in immunocompetent patients, uncomplicated. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9

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	1	0	1	0	1	0	2	3	10
		References		Study Quality											
		65 (2818109)		4											
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	8	3	3	0	2	1	1	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	7	8	2	0	0	0	0	0	0
CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	9	6	2	0	0	0	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	13	1	0	2	1	0	1	0	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	1	2	0	0	0	0	0	1
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	1	2	0	0	0	0	1	0
V/Q scan lung	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	15	0	2	0	0	0	1	0	0
US chest	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	14	1	1	0	0	1	1	0	0

Variant 8: Adult. Acute COPD exacerbation in immunocompetent patients with accompanying chest pain, or 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

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	1	0	1	0	1	0	2	3	10
		References		Study Quality											
		65 (2818109)		4											
CTA chest with IV contrast	May be appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	2	0	4	3	6	2	0	0	0
CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	6	4	1	0	0	0	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	5	4	3	3	1	1	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	13	0	1	1	2	0	0	1	0
MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	2	1	2	0	0	0	0	1
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	2	2	1	0	0	0	1	0
V/Q scan lung	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	9	6	2	0	0	0	0	0	0
US chest	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	11	1	3	1	0	1	0	1	0
		References		Study Quality											
		21 (25758182)		2											
		22 (22700780)		3											

Variant 9: Adult. Acute respiratory illness in immunocompetent patients with suspected pneumonia on initial imaging. Follow-up imaging to ensure resolution.

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	Strong	☢ <0.1 mSv	☢ <0.03 mSv [ped]	9	9	1	0	0	0	1	1	4	2	9
		References		Study Quality											
		73 (20102994)		2											
		74 (21518934)		2											
		68 (24370128)		4											
		69 (25583286)		2											
		72 (31573350)		4											
		75 (23222200)		2											
		70 (8460356)		2											
		71 (7963634)		4											
CT chest with IV contrast	May be appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	1	2	10	4	0	0	0
		References		Study Quality											
		68 (24370128)		4											
		69 (25583286)		2											
		67 (25531242)		2											
CT chest without IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	1	0	11	4	1	0	0
		References		Study Quality											
		68 (24370128)		4											
		67 (25531242)		2											
CTA chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	1	1	2	2	0	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	11	2	2	2	0	1	0	0	0

MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	0	0	0	1	1	0	0	1
MRI chest without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	0	0	1	0	0	1	0
V/Q scan lung	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	16	1	0	0	0	0	1	0	0
US chest	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	16	0	0	0	0	2	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.**