American College of Radiology
ACR Appropriateness Criteria®

Acute Respiratory Illness in Immunocompromised Patients

Variant 1: Acute respiratory illness in immunocompromised patients. Cough, dyspnea, chest pain, or fever. 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	0	0	0	0	0	0	11
References				Study Quality											
5 (21976629)				3											
3 (22388581)				4											
1 (19662340)				3											
4 (16228209)				4											
CT chest with IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	6	0	0	1	1	3	5	1	0	0
References				Study Quality											
2 (19393494)				4											
3 (22388581)				4											
CT chest without IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	6	0	0	0	1	4	6	0	0	0
References				Study Quality											
2 (19393494)				4											
3 (22388581)				4											
MRI chest without IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	5	1	4	1	0	0	0	1	0

		References		Study Quality											
		2 (19393494)		4											
MRI chest without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	5	1	3	2	0	0	0	1	0
		References		Study Quality											
		2 (19393494)		4											
CT chest without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	1	2	0	2	0	0	1	0
		References		Study Quality											
		2 (19393494)		4											
		3 (22388581)		4											
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	8	0	3	0	0	0	0	0	1
		References		Study Quality											
		2 (19393494)		4											

Variant 2: Acute respiratory illness in immunocompromised patients. Normal, equivocal, or nonspecific 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	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	9	9	0	0	0	0	0	0	0	0	0
		References		Study Quality											
		8 (22623570)		4											
		7 (15597222)		3											
		6 (9353456)		3											
		1 (19662340)		3											
		4 (16228209)		4											

CT chest with IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	6	0	0	0	0	2	5	4	1	0

References	Study Quality
8 (22623570)	4
7 (15597222)	3
6 (9353456)	3
1 (19662340)	3
4 (16228209)	4

MRI chest without IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	3	3	1	1	5	1	3	0	1	0	0

References	Study Quality
9 (27641778)	2
10 (28066933)	2
11 (26971435)	2
12 (17943326)	2

MRI chest without and with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	3	3	3	1	3	0	4	1	0	0	0

References	Study Quality
9 (27641778)	2
10 (28066933)	2
11 (26971435)	2
12 (17943326)	2

CT chest without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	0	0	0	0	0	0	0	0	0

References	Study Quality
8 (22623570)	4
7 (15597222)	3
6 (9353456)	3
1 (19662340)	3
4 (16228209)	4

FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	1	3	0	0	0	0	0	1

References	Study Quality
13 (28267531)	2

Variant 3: Acute respiratory illness in immunocompromised patients. Abnormal chest radiograph, multiple, diffuse, or confluent opacities. 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	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	7	7	0	0	0	0	0	0	0	0	0

References	Study Quality
26 (25440914)	4
15 (18553280)	4
24 (14500230)	4
14 (18267185)	4
23 (16915062)	3
27 (22802096)	2
19 (19294624)	2
22 (15246518)	4
20 (22993384)	4
28 (22795844)	4
16 (20049469)	3
17 (18455559)	4
25 (17151065)	4
32 (23440166)	3
31 (19242297)	4
4 (16228209)	4
30 (26607644)	2
29 (24365560)	2

CT chest with IV contrast	May be appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	6	0	0	1	1	3	5	3	0	1

References	Study Quality
18 (22766482)	3
21 (28812135)	4
26 (25440914)	4
15 (18553280)	4
8 (22623570)	4
24 (14500230)	4
14 (18267185)	4
23 (16915062)	3
27 (22802096)	2
19 (19294624)	2
22 (15246518)	4
20 (22993384)	4
28 (22795844)	4
16 (20049469)	3
17 (18455559)	4
25 (17151065)	4
32 (23440166)	3
31 (19242297)	4
4 (16228209)	4
30 (26607644)	2
29 (24365560)	2
18 (22766482)	3
21 (28812135)	4

Image-guided transthoracic needle biopsy	May be appropriate	Limited	Varies	Varies	5	5	0	0	0	0	0	0	0	0	0

References	Study Quality
39 (19468797)	4
37 (20630827)	3

		38 (28956284)		4												
		36 (27845850)		3												
MRI chest without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	1	2	3	1	4	1	0	0	0	
		References		Study Quality												
		9 (27641778)		2												
		34 (28267546)		2												
		10 (28066933)		2												
		11 (26971435)		2												
		35 (25231132)		2												
		33 (24189389)		1												
		12 (17943326)		2												
MRI chest without and with IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	4	4	0	1	1	5	3	1	0	0	0	
		References		Study Quality												
		9 (27641778)		2												
		34 (28267546)		2												
		10 (28066933)		2												
		11 (26971435)		2												
		35 (25231132)		2												
		33 (24189389)		1												
		12 (17943326)		2												
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	5	2	4	0	0	0	0	1	0	
		References		Study Quality												
		13 (28267531)		2												
CT chest without and with IV contrast	Usually not appropriate	Strong	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	0	0	0	0	0	0	0	0	0	
		References		Study Quality												
		26 (25440914)		4												

15 (18553280)	4
24 (14500230)	4
14 (18267185)	4
23 (16915062)	3
27 (22802096)	2
19 (19294624)	2
22 (15246518)	4
20 (22993384)	4
28 (22795844)	4
16 (20049469)	3
17 (18455559)	4
25 (17151065)	4
32 (23440166)	3
31 (19242297)	4
4 (16228209)	4
30 (26607644)	2
29 (24365560)	2
18 (22766482)	3
21 (28812135)	4

Variant 4: Acute respiratory illness in immunocompromised patients. Abnormal chest radiograph, noninfectious disease suspected. 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	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	8	8	0	0	0	0	0	0	0	0	0

References	Study Quality
45 (15701913)	2
41 (22896776)	4
2 (19393494)	4

		43 (7543802)		3												
		40 (10992015)		4												
		42 (17620461)		4												
		44 (24819788)		4												
CT chest with IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	0	0	0	0	0	0	0	
		References		Study Quality												
		45 (15701913)		2												
		41 (22896776)		4												
		2 (19393494)		4												
		43 (7543802)		3												
		40 (10992015)		4												
		42 (17620461)		4												
		44 (24819788)		4												
Image-guided transthoracic needle biopsy	May be appropriate	Limited	Varies	Varies	5	5	0	0	0	0	0	0	0	0	0	
		References		Study Quality												
		50 (16623303)		3												
		36 (27845850)		3												
		49 (22369939)		4												
		48 (19728397)		3												
FDG-PET/CT skull base to mid-thigh	May be appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	1	0	2	0	4	5	0	0	0	
		References		Study Quality												
		13 (28267531)		2												
		46 (21674240)		4												
		47 (20087557)		3												
MRI chest without IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	4	4	1	1	4	1	4	0	1	0	0	

MRI chest without and with IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	4	4	0	1	1	5	3	1	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	0	0	0	0	0	0	0	0	0

References	Study Quality
45 (15701913)	2
41 (22896776)	4
2 (19393494)	4
43 (7543802)	3
40 (10992015)	4
42 (17620461)	4
44 (24819788)	4

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.**