American College of Radiology
ACR Appropriateness Criteria®

Fever Without Source or Unknown Origin-Child

Variant 1: Child up to 3 months of age. Fever without source and clinical concern for occult pneumonia. 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]	5	5	1	1	1	4	7	1	0	0	1

References	Study Quality
13 (3347713)	3
23 (27106368)	4
14 (34425771)	3
21 (-3196031)	1

CT abdomen and pelvis with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	1	0	0	0	0	0	0	0
CT abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	13	0	0	0	0	0	0	0	0
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	1	1	12	1	0	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	8	2	2	0	0	0	1	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	8	3	0	0	1	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	11	0	0	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	11	1	0	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	11	0	1	1	0	0	0	0	0
MRI whole body without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	0	0	1	0	0	0	0	0
MRI whole body without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	12	0	0	1	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	0	0	0	1	0	0	0	0
US chest	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	15	0	0	0	0	0	1	0	0
FDG-PET/MRI whole body	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	0	0	1	0	0	0	0	0

Variant 2: Child aged 3 to 36 months. Fever without source and with low risk for occult pneumonia. 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]	4	4	0	2	2	5	5	1	1	0	0

References	Study Quality
29 (2119118)	4
30 (34694254)	2
31 (34845493)	3

CT abdomen and pelvis with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	10	0	1	1	0	1	0	0	0
CT abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	0	0	0	1	0	0	0	0
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	1	1	12	0	0	0	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	0	1	1	0	0	0	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	0	0	1	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	12	0	0	1	0	0	0	0	0
CT paranasal sinuses with IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	10	0	1	1	1	0	0	0	0
CT paranasal sinuses without IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	10	0	1	0	2	0	0	0	0
CT paranasal sinuses without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	11	0	0	2	0	0	0	0	0
CT neck with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	11	0	0	0	2	0	0	0	0
CT neck without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	12	0	0	1	0	0	0	0	0
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	0	0	1	0	0	0	0	0

MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	0	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	11	0	1	0	1	0	0	0	0
MRI whole body without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	1	1	1	0	1	0	0	0
MRI whole body without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	0	0	0	1	1	0	0	0
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	15	1	0	0	0	0	0	0	0
US abdomen	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	5	2	0	0	0	0	0	0
US kidneys and bladder	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	2	1	0	0	0	0	0	0
FDG-PET/MRI whole body	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	9	1	1	0	0	1	1	0	0

Variant 3: Child. Fever without source and neutropenia. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
CT abdomen and pelvis with IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	6	6	0	0	0	2	2	4	3	1	1

References	Study Quality
36 (21265012)	4
35 (25929242)	3
34 (28459614)	4

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

References	Study Quality
36 (21265012)	4
35 (25929242)	3
34 (28459614)	4
37 (31211850)	3

FDG-PET/CT whole body	May be appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	6	6	0	0	1	0	4	2	4	2	0

References	Study Quality
41 (24869631)	3
42 (26187213)	4
39 (35115619)	4
40 (29235187)	4

CT chest without IV contrast	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	2	2	5	7	0	0	0

References	Study Quality
36 (21265012)	4
35 (25929242)	3
34 (28459614)	4

CT paranasal sinuses with IV contrast	May be appropriate	Limited	☢☢ 0.1-1mSv	☢☢☢ 0.3-3 mSv [ped]	5	5	2	0	3	3	8	0	0	0	0

References	Study Quality
36 (21265012)	4
35 (25929242)	3
34 (28459614)	4

CT paranasal sinuses without IV contrast	May be appropriate	Limited	☢☢ 0.1-1mSv	☢☢☢ 0.3-3 mSv [ped]	5	5	1	0	3	0	10	1	1	0	0

References	Study Quality

		36 (21265012)	4												
		35 (25929242)	3												
		34 (28459614)	4												
Radiography chest	May be appropriate (Disagreement)	Expert Opinion	☢ <0.1 mSv	☢ <0.03 mSv [ped]	5	5	0	0	2	1	4	2	3	2	2
		References	Study Quality												
		46 (21826781)	4												
		34 (28459614)	4												
		44 (-3196033)	4												
		45 (22278307)	4												
FDG-PET/MRI whole body	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	1	1	3	4	6	1	0	0	0
		References	Study Quality												
		40 (29235187)	4												
		43 (34277510)	4												
MRI whole body without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	5	1	2	0	4	1	0	0	0
US abdomen	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	3	4	7	1	1	0	0	0	0
CT chest without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	4	1	0	1	1	0	0	0
		References	Study Quality												
		36 (21265012)	4												
		35 (25929242)	3												
		34 (28459614)	4												
		37 (31211850)	3												
CT paranasal sinuses without and with IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	4	1	0	2	0	0	0	0
		References	Study Quality												

		36 (21265012)		4											
		35 (25929242)		3											
		34 (28459614)		4											
MRI abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	6	2	2	2	0	1	0	0	0
MRI whole body without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	6	2	2	0	2	1	0	0	0
CT abdomen and pelvis without IV contrast	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	4	0	1	1	0	0	0	0
		References		Study Quality											
		36 (21265012)		4											
		35 (25929242)		3											
		34 (28459614)		4											
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Limited	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	1	1	7	3	2	0	0	1	0	0	0
		References		Study Quality											
		36 (21265012)		4											
		35 (25929242)		3											
		34 (28459614)		4											
CT neck with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	8	2	1	1	0	1	0	0	0
CT neck without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	10	1	1	0	0	1	0	0	0
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	10	1	1	0	1	0	0	0	0
MRI abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	7	2	2	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	8	2	2	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	8	2	2	0	1	0	0	0	0
Fluoride PET/CT whole body	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	4	1	0	0	1	0	0	0
Bone scan and WBC scan whole body	Usually not appropriate	Expert Consensus		☢☢☢☢ 3-10 mSv [ped]	1	1	10	1	0	0	1	0	1	0	0
3-phase bone scan whole body	Usually not appropriate	Expert Consensus		☢☢☢☢ 3-10 mSv [ped]	1	1	11	0	0	0	0	2	0	0	0

Variant 4: Child. Fever of unknown origin. 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	1	5	7	1	0	2
References			Study Quality												
24 (26330472)			4												
MRI whole body without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	1	0	3	1	9	1	1	0	0
References			Study Quality												
62 (24826973)			4												
63 (26892067)			4												
61 (30900227)			4												
47 (32767967)			4												
MRI whole body without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	1	0	2	1	11	1	0	0	0

References	Study Quality
62 (24826973)	4
63 (26892067)	4
61 (30900227)	4
47 (32767967)	4

FDG-PET/MRI whole body	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	5	5	0	0	2	2	4	4	1	0	0

References	Study Quality
59 (24762622)	4
60 (31012760)	4
43 (34277510)	4

FDG-PET/CT whole body	May be appropriate	Strong	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	1	2	4	3	3	0	1	0	0

References	Study Quality
57 (23479196)	4
41 (24869631)	3
51 (28928271)	2
50 (30205705)	Not Assessed
53 (28600002)	Good
52 (31271266)	3
39 (35115619)	4
54 (26554525)	3
56 (30412093)	Not Assessed
49 (32498991)	4
25 (27037917)	Good
48 (27339873)	Not Assessed
55 (31982625)	2
58 (32030452)	3

US abdomen	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	3	5	6	1	0	1	0	0	0

CT abdomen and pelvis with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	2	2	6	1	4	1	0	0	1	0	0
CT paranasal sinuses with IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv	☢☢☢ 0.3-3 mSv [ped]	2	2	5	4	2	0	0	1	1	0	0
CT paranasal sinuses without IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv	☢☢☢ 0.3-3 mSv [ped]	2	2	6	1	4	0	1	0	1	0	0
CT abdomen and pelvis without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	10	1	1	0	1	0	0	0	0
CT abdomen and pelvis without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢☢ 10-30 mSv [ped]	1	1	10	1	0	0	1	1	0	0	0
CT chest with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	1	3	1	0	1	0	0	0
CT chest without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	1	2	1	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	10	1	0	0	1	0	1	0	0
CT paranasal sinuses without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	10	1	1	0	0	1	0	0	0
CT neck with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	9	1	1	1	0	1	0	0	0
CT neck without IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢ 0.3-3 mSv [ped]	1	1	10	1	1	0	1	0	0	0	0
CT neck without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	10	1	1	0	0	1	0	0	0

MRI chest without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	7	3	2	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	7	3	2	0	1	0	0	0	0
Fluoride PET/CT whole body	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	7	4	1	0	0	1	0	0	0
Bone scan and WBC scan whole body	Usually not appropriate	Limited		☢☢☢☢ 3-10 mSv [ped]	1	1	8	2	2	0	1	0	0	0	0

References	Study Quality
24 (26330472)	4

3-phase bone scan whole body	Usually not appropriate	Limited		☢☢☢☢ 3-10 mSv [ped]	1	1	9	1	2	0	1	0	0	0	0

References	Study Quality
24 (26330472)	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.**