American College of Radiology
ACR Appropriateness Criteria®

Osteomyelitis or Septic Arthritis-Child (Excluding Axial Skeleton)

Variant 1: Child. Younger than 5 years of age. Concern for osteomyelitis or septic arthritis involving an extremity. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography area of interest	Usually appropriate	Strong	Varies	Varies	9	9	0	0	0	0	1	0	2	3	11

References	Study Quality
3 (21523583)	4
48 (8475290)	4
47 (6739205)	4
30 (20304319)	4
45 (28696851)	4
36 (26295653)	2
46 (23812139)	2
29 (7618566)	4

MRI area of interest without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	2	2	7	5	0

References	Study Quality
38 (20180105)	3
37 (19380545)	3
39 (22268189)	3
30 (20304319)	4
41 (22194497)	2
32 (30903335)	2

36 (26295653)	2
33 (26209118)	2
40 (25986395)	4
35 (23685708)	2
42 (20936273)	2
34 (21381610)	4
29 (7618566)	4
31 (17118291)	4
28 (2068324)	2

US area of interest	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	1	0	0	1	3	10	1	0

References	Study Quality
48 (8475290)	4
51 (11961445)	4
50 (25588046)	4
17 (29728840)	3
45 (28696851)	4
53 (23755165)	3
52 (19695738)	2
54 (7983130)	4
49 (3321461)	3

MRI extremity area of interest without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	0	4	10	2	0

References	Study Quality
43 (23883225)	2

MRI area of interest without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	2	1	8	3	2	0

References	Study Quality
38 (20180105)	3
37 (19380545)	3
39 (22268189)	3

		30 (20304319)		4											
		41 (22194497)		2											
		32 (30903335)		2											
		36 (26295653)		2											
		33 (26209118)		2											
		40 (25986395)		4											
		35 (23685708)		2											
		42 (20936273)		2											
		34 (21381610)		4											
		29 (7618566)		4											
		31 (17118291)		4											
		28 (2068324)		2											
MRI extremity area of interest without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	6	4	4	1	0
		References		Study Quality											
		43 (23883225)		2											
MRI whole body without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	1	6	0	1	6	1	1	0	0
		References		Study Quality											
		44 (30623210)		2											
		13 (28514223)		4											
MRI whole body without and with IV contrast	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	2	2	5	0	4	2	1	0	0
		References		Study Quality											
		44 (30623210)		2											
		13 (28514223)		4											
CT area of interest with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	10	3	2	1	0	0	1	0	0
CT area of interest without IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	13	0	2	1	0	1	0	0	0

CT area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	3	0	1	0	1	0	0	0
3-phase bone scan area of interest	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	13	1	1	1	0	0	0	1	0
Bone scan whole body	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	4	0	0	0	1	0	0	0
Bone scan whole body and 3-phase bone scan area of interest	Usually not appropriate	Expert Consensus		☢☢☢☢ 3-10 mSv [ped]	1	1	11	3	1	0	0	1	1	0	0

Variant 2: Child. Younger than 5 years of age. Concern for osteomyelitis or septic arthritis involving an extremity. Initial radiographs normal, or with findings suggestive of osteomyelitis. Next imaging study.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI area of interest without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	1	5	4	7

References	Study Quality
38 (20180105)	3
37 (19380545)	3
39 (22268189)	3
30 (20304319)	4
41 (22194497)	2
32 (30903335)	2
18 (25575360)	4
36 (26295653)	2
33 (26209118)	2
40 (25986395)	4
35 (23685708)	2
42 (20936273)	2

MRI extremity area of interest without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	2	0	2	7	6

References	Study Quality
43 (23883225)	2

US area of interest	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	1	0	1	2	3	8	1	0

References	Study Quality
48 (8475290)	4
51 (11961445)	4
50 (25588046)	4
17 (29728840)	3
45 (28696851)	4
53 (23755165)	3
52 (19695738)	2
54 (7983130)	4
49 (3321461)	3

MRI extremity area of interest without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	1	1	4	2	7	1	0

References	Study Quality
43 (23883225)	2

Image-guided aspiration area of interest	Usually appropriate	Limited	Varies	Varies	7	7	0	0	0	0	1	1	10	3	1

References	Study Quality
48 (8475290)	4
66 (27603195)	3
65 (26830217)	3

MRI area of interest without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	0	0	1	1	5	2	3	4	0	
MRI whole body without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	1	1	1	11	1	1	0	0	
MRI whole body without and with IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	2	2	8	3	1	0	0	

References	Study Quality
18 (25575360)	4
64 (23389564)	2

References	Study Quality
38 (20180105)	3
37 (19380545)	3
39 (22268189)	3
30 (20304319)	4
41 (22194497)	2
32 (30903335)	2
18 (25575360)	4
36 (26295653)	2
33 (26209118)	2
40 (25986395)	4
35 (23685708)	2
42 (20936273)	2
34 (21381610)	4
67 (21102217)	3
29 (7618566)	4
31 (17118291)	4
28 (2068324)	2

References	Study Quality
44 (30623210)	2

References	Study Quality
44 (30623210)	2

Bone scan whole body and 3-phase bone scan area of interest	May be appropriate	Limited		☢☢☢☢ 3-10 mSv [ped]	4	4	0	2	2	5	4	3	0	0	0

References	Study Quality
61 (12368368)	4
8 (23478935)	4
57 (21383641)	4
63 (20308478)	3
58 (22582364)	4
55 (1178860)	4
62 (179356)	4
60 (1250652)	4
56 (1572114)	4
59 (8113299)	4

CT area of interest with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	2	2	7	3	3	1	2	1	0	0	0
CT area of interest without IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	10	1	2	1	2	0	1	0	0
CT area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	13	1	1	0	2	0	0	0	0

Variant 3: Child. 5 years of age or older. Concern for osteomyelitis or septic arthritis involving an extremity. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography area of interest	Usually appropriate	Moderate	Varies	Varies	9	9	1	0	0	1	1	0	1	4	9

References	Study Quality
3 (21523583)	4
48 (8475290)	4
47 (6739205)	4

References	Study Quality
30 (20304319)	4
45 (28696851)	4
36 (26295653)	2
29 (7618566)	4

MRI area of interest without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	1	0	1	0	2	1	2	8	2	

References	Study Quality
38 (20180105)	3
37 (19380545)	3
39 (22268189)	3
30 (20304319)	4
32 (30903335)	2
19 (30969258)	3
17 (29728840)	3
16 (26691242)	3
18 (25575360)	4
7 (25575359)	3
36 (26295653)	2
33 (26209118)	2
20 (25698366)	3
35 (23685708)	2
34 (21381610)	4
29 (7618566)	4
31 (17118291)	4
28 (2068324)	2

MRI area of interest without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	1	3	7	5	0	

References	Study Quality
38 (20180105)	3
37 (19380545)	3
39 (22268189)	3

30 (20304319)	4
32 (30903335)	2
19 (30969258)	3
17 (29728840)	3
16 (26691242)	3
18 (25575360)	4
7 (25575359)	3
36 (26295653)	2
33 (26209118)	2
20 (25698366)	3
35 (23685708)	2
34 (21381610)	4
29 (7618566)	4
31 (17118291)	4
28 (2068324)	2

US area of interest	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	7	7	0	1	0	1	3	1	10	0	0

References	Study Quality
48 (8475290)	4
51 (11961445)	4
50 (25588046)	4
17 (29728840)	3
45 (28696851)	4
53 (23755165)	3
52 (19695738)	2
54 (7983130)	4
49 (3321461)	3

MRI extremity area of interest without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	1	2	7	6	0

References	Study Quality
43 (23883225)	2

MRI extremity area of interest without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	6	3	4	3	0
	References		Study Quality												
	43 (23883225)		2												
MRI whole body without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	6	2	6	0	1	2	0	0	0
MRI whole body without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	3	3	7	0	6	1	2	1	0	0	0
CT area of interest with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	10	1	3	2	0	1	0	0	0
CT area of interest without IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	11	1	2	2	0	1	0	0	0
CT area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	2	0	1	1	1	0	0	0
3-phase bone scan area of interest	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	1	1	1	0	1	1	0	0
Bone scan whole body	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	12	2	1	0	0	2	0	0	0
Bone scan whole body and 3-phase bone scan area of interest	Usually not appropriate	Expert Consensus		☢☢☢☢ 3-10 mSv [ped]	1	1	15	0	1	0	0	0	0	0	0

Variant 4: Child. 5 years of age or older. Concern for osteomyelitis or septic arthritis involving an extremity. Initial radiographs normal, or with findings suggestive of osteomyelitis. Next imaging study.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI area of interest without and with IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	1	1	4	10
	References		Study Quality												

MRI area of interest without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	1	7	7	1

References	Study Quality
38 (20180105)	3
37 (19380545)	3
39 (22268189)	3
30 (20304319)	4
32 (30903335)	2
19 (30969258)	3
17 (29728840)	3
16 (26691242)	3
18 (25575360)	4
7 (25575359)	3
36 (26295653)	2
33 (26209118)	2
20 (25698366)	3
35 (23685708)	2
34 (21381610)	4
67 (21102217)	3
29 (7618566)	4
31 (17118291)	4
28 (2068324)	2

References	Study Quality
38 (20180105)	3
37 (19380545)	3
39 (22268189)	3
30 (20304319)	4
32 (30903335)	2
19 (30969258)	3
17 (29728840)	3
16 (26691242)	3
18 (25575360)	4

References	Study Quality
7 (25575359)	3
36 (26295653)	2
33 (26209118)	2
20 (25698366)	3
35 (23685708)	2
34 (21381610)	4
67 (21102217)	3
29 (7618566)	4
31 (17118291)	4
28 (2068324)	2

MRI extremity area of interest without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	2	0	2	8	5

References	Study Quality
43 (23883225)	2

MRI extremity area of interest without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	1	2	9	4	0

References	Study Quality
43 (23883225)	2

Image-guided aspiration area of interest	Usually appropriate	Limited	Varies	Varies	7	7	0	0	0	1	1	6	5	1	2

References	Study Quality
48 (8475290)	4
66 (27603195)	3
65 (26830217)	3
64 (23389564)	2

US area of interest	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	1	3	8	4	0	0

References	Study Quality
48 (8475290)	4
51 (11961445)	4
50 (25588046)	4

17 (29728840)	3
45 (28696851)	4
53 (23755165)	3
52 (19695738)	2
54 (7983130)	4
49 (3321461)	3

3-phase bone scan area of interest	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	1	6	2	5	1	1	0	0

References	Study Quality
8 (23478935)	4
57 (21383641)	4
63 (20308478)	3
55 (1178860)	4
56 (1572114)	4

Bone scan whole body	May be appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	4	4	0	1	7	2	5	1	0	0	0

References	Study Quality
57 (21383641)	4
63 (20308478)	3
58 (22582364)	4
60 (1250652)	4
59 (8113299)	4

Bone scan whole body and 3-phase bone scan area of interest	May be appropriate	Limited		☢☢☢☢ 3-10 mSv [ped]	4	4	0	1	0	8	3	2	1	1	0

References	Study Quality
61 (12368368)	4
57 (21383641)	4
63 (20308478)	3
58 (22582364)	4
62 (179356)	4

CT area of interest with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	2	2	7	2	5	1	2	0	0	0	0
MRI whole body without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	6	3	2	2	3	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	5	4	4	1	2	1	0	0	0
CT area of interest without IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	9	2	3	1	2	0	0	0	0
CT area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	1	1	1	2	0	0	0	0

Variant 5: Child. With one or more clinical signs concerning for septic arthritis. Initial radiographs normal or demonstrating possible joint effusion. Next imaging study.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
US area of interest	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	4	4	9

References	Study Quality
48 (8475290)	4
51 (11961445)	4
50 (25588046)	4
45 (28696851)	4
52 (19695738)	2
49 (3321461)	3

MRI area of interest without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	2	0	1	0	3	5	6

References	Study Quality
39 (22268189)	3
19 (30969258)	3
69 (29389760)	3

17 (29728840)	3
16 (26691242)	3
18 (25575360)	4
7 (25575359)	3
68 (23653039)	4

Image-guided aspiration area of interest	Usually appropriate	Limited	Varies	Varies	8	8	0	1	0	0	2	0	1	5	8

References	Study Quality
48 (8475290)	4
66 (27603195)	3
65 (26830217)	3
64 (23389564)	2

MRI area of interest without IV contrast	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	3	7	5	1	0

References	Study Quality
39 (22268189)	3
19 (30969258)	3
69 (29389760)	3
17 (29728840)	3
16 (26691242)	3
18 (25575360)	4
7 (25575359)	3
68 (23653039)	4

MRI extremity area of interest without and with IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	6	6	0	0	0	0	4	5	4	3	0
MRI extremity area of interest without IV contrast	May be appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	0	12	0	3	1	0
CT area of interest with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	2	2	8	4	3	1	1	0	0	0	0

MRI whole body without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	6	5	3	1	1	0	1	0	0
MRI whole body without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	0	9	1	1	4	0	1	0	0
CT area of interest without IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	11	3	1	1	0	1	0	0	0
CT area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	2	1	0	1	1	0	0	0
3-phase bone scan area of interest	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	10	3	1	2	1	0	0	0	0
		References		Study Quality											
		55 (1178860)		4											
Bone scan whole body	Usually not appropriate	Limited	☢☢☢ 1-10 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	11	3	2	1	0	0	0	0	0
		References		Study Quality											
		59 (8113299)		4											
Bone scan whole body and 3-phase bone scan area of interest	Usually not appropriate	Expert Consensus		☢☢☢☢ 3-10 mSv [ped]	1	1	10	4	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.**