

**American College of Radiology  
ACR Appropriateness Criteria®**

**Chronic Extremity Joint Pain-Suspected Inflammatory Arthritis, Crystalline Arthritis, or Erosive Osteoarthritis**

**Variant 1: Chronic extremity joint pain. Suspect inflammatory (seropositive or seronegative arthritis), crystalline (gout or pseudogout), or erosive osteoarthritis. 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	0	0	0	2	14
		References		Study Quality											
		13 (23520036)		4											
		12 (11145034)		1											
		11 (16848914)		2											
		10 (21278073)		M											
		9 (10366117)		1											
		8 (24450681)		3											
CT area of interest with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	15	1	0	0	0	0	0	0	0
CT area of interest without IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	1	2	0	1	0	0	0	0
CT area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	16	0	0	0	0	0	0	0	0
MRI area of interest without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	12	0	2	0	2	0	0	0	0
MRI area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	1	1	13	0	1	0	1	1	0	0	0

Bone scan whole body	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	15	1	0	0	0	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	16	0	0	0	0	0	0	0	0
US area of interest	Usually not appropriate	Expert Consensus	○ 0 mSv	○ 0 mSv [ped]	1	1	10	2	2	0	0	0	1	1	0

**Variant 2: Chronic extremity joint pain. Suspect inflammatory arthritis (seropositive or seronegative arthritis). Radiographs normal or inconclusive. 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	○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	0	2	3	11
			References	Study Quality											
			28 (25537977)	3											
			24 (20966327)	4											
			25 (23192434)	4											
			27 (29490980)	1											
			26 (30770509)	3											
			23 (25636414)	3											
			22 (19671817)	2											
			21 (22723498)	2											
			20 (26681086)	3											
			19 (27134251)	3											
			18 (24528508)	4											
			13 (23520036)	4											
US area of interest	Usually appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	9	9	1	0	0	0	1	3	1	1	9
			References	Study Quality											

46 (32803573)	4
45 (27219303)	1
44 (23997769)	3
43 (19714611)	2
42 (24488415)	2
41 (23553120)	3
40 (33556758)	2
39 (33180165)	2
38 (15077292)	1
37 (31630207)	3
36 (31304659)	3
35 (28340066)	Not Assessed
34 (24356473)	3
33 (26939710)	3
32 (32211929)	4
31 (31663417)	3
30 (24445255)	2
29 (21538312)	2
25 (23192434)	4
21 (22723498)	2
18 (24528508)	4
13 (23520036)	4
12 (11145034)	1
11 (16848914)	2

MRI area of interest without IV contrast	Usually appropriate	Limited	0 mSv	0 mSv [ped]	7	7	0	0	1	1	1	5	4	2	2
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References	Study Quality
28 (25537977)	3
24 (20966327)	4
25 (23192434)	4
23 (25636414)	3

20 (26681086)	3
19 (27134251)	3
18 (24528508)	4
13 (23520036)	4

CT area of interest without IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	2	2	8	1	5	2	0	0	0	0	0
Image-guided aspiration area of interest	Usually not appropriate	Expert Consensus	Varies	Varies	2	2	8	1	3	1	1	1	0	0	1
CT area of interest with IV contrast	Usually not appropriate	Limited	Varies	Varies	1	1	9	1	6	0	0	0	0	0	0

References	Study Quality
15 (33281053)	4

CT area of interest without and with IV contrast	Usually not appropriate	Limited	Varies	Varies	1	1	11	0	5	0	0	0	0	0	0
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References	Study Quality
15 (33281053)	4

Bone scan whole body	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	12	2	0	1	1	0	0	0	0
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References	Study Quality
9 (10366117)	1
14 (24315051)	4

Bone scan whole body with SPECT or SPECT/CT area of interest	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	10	0	5	0	1	0	0	0	0
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References	Study Quality
14 (24315051)	4

FDG-PET/CT whole body	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	12	3	0	0	1	0	0	0	0
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References	Study Quality
14 (24315051)	4



			58 (25972391)		3													
			55 (31167758)		4													
			50 (25180122)		4													
Image-guided aspiration area of interest	May be appropriate	Limited	Varies	Varies	6	6	0	0	0	1	7	1	4	1	2			
			References		Study Quality													
			56 (856219)		4													
MRI area of interest without IV contrast	Usually not appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	3	3	6	0	4	2	4	0	0	0	0			
			References		Study Quality													
			55 (31167758)		4													
			57 (24080252)		1													
MRI area of interest without and with IV contrast	Usually not appropriate	Moderate	0 0 mSv	0 0 mSv [ped]	3	3	5	1	6	1	2	0	0	1	0			
			References		Study Quality													
			55 (31167758)		4													
			57 (24080252)		1													
CT area of interest with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	3	0	0	1	0	0	0	0			
CT area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	13	2	0	0	0	0	0	0	1			
Bone scan whole body	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	13	2	0	0	1	0	0	0	0			
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	15	0	0	0	1	0	0	0	0			

**Variant 4: Chronic extremity joint pain. Suspect calcium pyrophosphate dihydrate disease (pseudogout). Radiographs normal or inconclusive. 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 area of interest without IV contrast	Usually appropriate	Limited	Varies	Varies	8	8	0	0	0	1	1	2	3	2	6	
		References	Study Quality													
		70 (33131218)	3													
		71 (29622016)	2													
		69 (24703345)	4													
US area of interest	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	1	0	0	0	3	1	5	2	4	
		References	Study Quality													
		75 (32988839)	1													
		74 (30738145)	2													
		73 (24115756)	2													
Image-guided aspiration area of interest	May be appropriate	Limited	Varies	Varies	6	6	0	0	0	0	7	4	2	2	0	
		References	Study Quality													
		68 (26886247)	3													
MRI area of interest without IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	3	3	5	1	7	1	1	1	0	0	0	
		References	Study Quality													
		72 (34623546)	4													
MRI area of interest without and with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	3	3	6	1	6	1	1	0	1	0	0	
		References	Study Quality													
		72 (34623546)	4													
CT area of interest with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	14	0	1	0	1	0	0	0	0	
CT area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	14	0	0	0	1	0	0	0	1	

Bone scan whole body	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	15	0	0	0	1	0	0	0	0
FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	☹☹☹☹ 10-30 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	15	0	0	0	1	0	0	0	0

**Variant 5: Chronic extremity joint pain. Suspect erosive osteoarthritis. Radiographs normal or inconclusive. 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	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	0	1	0	3	7	2	1	0	1
		References		Study Quality											
		23 (25636414)		3											
US area of interest	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	4	4	1	1	1	5	3	3	0	0	1
		References		Study Quality											
		76 (21081530)		1											
CT area of interest without IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	3	3	5	2	5	3	0	0	0	0	0
MRI area of interest without IV contrast	Usually not appropriate	Expert Consensus	0 0 mSv	0 0 mSv [ped]	2	2	5	4	4	2	0	0	0	0	0
CT area of interest with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	13	1	1	0	1	0	0	0	0
CT area of interest without and with IV contrast	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	13	1	1	0	0	0	0	0	1
Bone scan whole body	Usually not appropriate	Expert Consensus	☹☹☹ 1-10 mSv	☹☹☹☹ 3-10 mSv [ped]	1	1	15	0	0	0	1	0	0	0	0



FDG-PET/CT whole body	Usually not appropriate	Expert Consensus	☢☢☢☢ 10-30 mSv	☢☢☢☢ 3-10 mSv [ped]	1	1	15	0	0	0	1	0	0	0	0
Image-guided aspiration area of interest	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	0	2	1	0	0	0	0	1

## **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).