

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

Imaging after Total Hip Arthroplasty

Variant 1: Routine follow-up of the asymptomatic patient after hip arthroplasty.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography hip	Usually appropriate	Limited	⊕⊕⊕ 1-10 mSv		9	9	0	0	0	0	0	2	1	3	8
		References		Study Quality											
		45 (27178012)		2											
		43 (33714635)		4											
		42 (25633021)		4											
		36 (29105547)		4											
		44 (-3195183)		4											
US hip	Usually not appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	3	3	5	1	3	3	2	0	0	0	0
		References		Study Quality											
		50 (26439179)		3											
		47 (22426776)		4											
		52 (26895821)		3											
		51 (25582840)		3											
		49 (33325734)		4											
		48 (20591612)		4											
		46 (22159851)		4											
		41 (24908625)		2											
		36 (29105547)		4											

MRI hip without IV contrast	Usually not appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	2	2	6	2	0	4	2	0	0	0	0
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References	Study Quality
36 (29105547)	4
31 (20419484)	4
37 (21458784)	4
6 (23047842)	4
41 (24908625)	2
40 (23621810)	1
39 (24954485)	3
38 (23233174)	2
35 (27094245)	4
34 (33267695)	4
33 (34232144)	1
32 (31863147)	2
19 (25019450)	4

CT hip without IV contrast	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		1	1	11	3	0	0	0	0	0	0	0
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MRI hip without and with IV contrast	Usually not appropriate	Strong	○ 0 mSv	○ 0 mSv [ped]	1	1	11	1	2	0	0	0	0	0	0
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References	Study Quality
41 (24908625)	2
40 (23621810)	1
39 (24954485)	3
38 (23233174)	2
37 (21458784)	4
36 (29105547)	4
35 (27094245)	4
34 (33267695)	4
33 (34232144)	1
32 (31863147)	2

MRI hip without IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	12	1	1	0	0	0	0	0	0
		References	Study Quality												
		49 (33325734)	4												
		54 (28145952)	2												
MRI hip without and with IV contrast	Usually not appropriate	Limited	0 0 mSv	0 0 mSv [ped]	1	1	11	0	2	0	1	0	0	0	0
		References	Study Quality												
		49 (33325734)	4												
		54 (28145952)	2												
Bone scan hip	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv		1	1	12	1	0	1	0	0	0	0	0
Image-guided aspiration hip	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	2	0	0	0	0	0	0	0
CT hip with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv		1	1	12	1	0	0	1	0	0	0	0
		References	Study Quality												
		53 (25744811)	4												
CT hip without and with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv		1	1	12	1	0	0	1	0	0	0	0
		References	Study Quality												
		53 (25744811)	4												
Fluoride PET/CT skull base to mid-thigh	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	12	1	1	0	0	0	0	0	0
Bone scan with SPECT or SPECT/CT hip	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	1	1	12	1	0	0	1	0	0	0	0

Variant 3: Symptomatic hip arthroplasty patient, history of acute injury. Additional imaging following radiographs.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
CT hip without IV contrast	Usually appropriate	Limited	⊕⊕⊕ 1-10 mSv		9	9	0	0	0	0	0	0	1	5	8	
		References	Study Quality													
		68 (25603973)	3													
		22 (22786996)	4													
		53 (25744811)	4													
		70 (28622117)	4													
		71 (31138187)	3													
MRI hip without IV contrast	May be appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	5	5	1	1	0	5	3	3	0	0	1	
		References	Study Quality													
		72 (25633023)	4													
		18 (23787986)	4													
MRI hip without and with IV contrast	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	11	1	0	0	0	2	0	0	0	
		References	Study Quality													
		18 (23787986)	4													
		72 (25633023)	4													
Bone scan hip	Usually not appropriate	Expert Consensus	⊕⊕⊕ 1-10 mSv		1	1	10	3	0	0	1	0	0	0	0	
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Expert Consensus	⊕⊕⊕⊕ 10-30 mSv	⊕⊕⊕⊕ 3-10 mSv [ped]	1	1	13	1	0	0	0	0	0	0	0	
US hip	Usually not appropriate	Limited	○ 0 mSv	○ 0 mSv [ped]	1	1	10	1	1	1	0	1	0	0	0	
		References	Study Quality													
		73 (22298875)	4													
Image-guided aspiration hip	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	12	1	1	0	0	0	0	0	0	

CT hip with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv		1	1	11	1	0	0	0	0	1	0	1
		References		Study Quality											
		22 (22786996)		4											
		53 (25744811)		4											
		68 (25603973)		3											
		70 (28622117)		4											
		71 (31138187)		3											
CT hip without and with IV contrast	Usually not appropriate	Limited	☼☼☼ 1-10 mSv		1	1	14	0	0	0	0	0	0	0	0
		References		Study Quality											
		22 (22786996)		4											
		53 (25744811)		4											
		68 (25603973)		3											
		70 (28622117)		4											
		71 (31138187)		3											
Fluoride PET/CT skull base to mid-thigh	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	12	1	1	0	0	0	0	0	0
Bone scan and gallium scan hip	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	11	2	1	0	0	0	0	0	0
WBC scan and sulfur colloid scan hip	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	11	2	0	0	1	0	0	0	0
Bone scan and gallium scan with SPECT or SPECT/CT hip	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv		1	1	11	2	1	0	0	0	0	0	0
Bone scan with SPECT or SPECT/CT hip	Usually not appropriate	Expert Consensus	☼☼☼ 1-10 mSv	☼☼☼☼☼ 3-10 mSv [ped]	1	1	10	3	0	0	0	1	0	0	0

Variant 4: Symptomatic hip arthroplasty patient, infection not excluded. Additional imaging following radiographs.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations									
							1	2	3	4	5	6	7	8	9	
Image-guided aspiration hip	Usually appropriate	Strong	Varies	Varies	9	9	0	0	0	0	1	0	2	1	10	
		References	Study Quality													
		105 (20449586)	2													
		106 (-3195185)	4													
		104 (28932957)	3													
		103 (33089335)	3													
		102 (30946198)	4													
		101 (34340666)	3													
MRI hip without IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	7	7	0	0	0	1	2	3	3	3	2	
		References	Study Quality													
		112 (21744254)	3													
		107 (23091176)	2													
		111 (32937252)	2													
		110 (33225607)	2													
		109 (32396046)	2													
		108 (32830902)	2													
		72 (25633023)	4													
WBC scan and sulfur colloid scan hip	Usually appropriate	Strong	☠☠☠☠ 10-30 mSv		7	7	0	0	0	0	5	2	6	1	0	
		References	Study Quality													
		88 (16950069)	2													
		95 (24873788)	2													
		96 (15534056)	3													
		115 (11547374)	3													
		116 (2266391)	3													
MRI hip without and with IV contrast	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	6	6	1	0	0	1	2	4	2	2	2	

References	Study Quality
112 (21744254)	3
111 (32937252)	2
110 (33225607)	2
109 (32396046)	2
108 (32830902)	2
107 (23091176)	2
72 (25633023)	4

US hip	May be appropriate	Limited	0 0 mSv	0 0 mSv [ped]	5	5	0	0	1	2	6	2	2	1	0
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References	Study Quality
114 (8037036)	3
47 (22426776)	4
113 (12818862)	3

CT hip with IV contrast	May be appropriate	Strong	☼☼☼ 1-10 mSv		5	5	0	0	0	1	11	1	1	0	0
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References	Study Quality
84 (12147845)	2
85 (31900512)	2
23 (27451263)	4

CT hip without IV contrast	May be appropriate	Strong	☼☼☼ 1-10 mSv		4	4	1	1	0	6	5	1	0	0	0
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References	Study Quality
84 (12147845)	2
85 (31900512)	2
23 (27451263)	4

Bone scan hip	Usually not appropriate	Strong	☼☼☼ 1-10 mSv		3	3	6	1	3	1	3	0	0	0	0
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References	Study Quality
61 (15044748)	2
82 (15795194)	2

			81 (18256077)		3														
			80 (29192730)		2														
Bone scan with SPECT or SPECT/CT hip	Usually not appropriate	Limited	☼☼☼ 1-10 mSv	☼☼☼☼ 3-10 mSv [ped]	3	3	5	1	3	3	1	1	0	0	0				
		References		Study Quality															
			83 (28929195)		2														
FDG-PET/CT skull base to mid-thigh	Usually not appropriate	Strong	☼☼☼☼ 10-30 mSv	☼☼☼☼ 3-10 mSv [ped]	2	2	6	2	0	1	5	0	0	0	0				
		References		Study Quality															
			94 (16512924)		3														
			61 (15044748)		2														
			96 (15534056)		3														
			95 (24873788)		2														
			93 (28791884)		3														
			92 (31362552)		3														
			91 (17662187)		2														
			90 (11197979)		3														
			89 (29679108)		3														
			88 (16950069)		2														
			87 (15821896)		3														
			86 (18421537)		2														
			82 (15795194)		2														
CT hip without and with IV contrast	Usually not appropriate	Strong	☼☼☼ 1-10 mSv		2	2	7	3	2	0	2	0	0	0	0				
		References		Study Quality															
			84 (12147845)		2														
			85 (31900512)		2														
			23 (27451263)		4														
Fluoride PET/CT skull base to mid-thigh	Usually not appropriate	Strong	☼☼☼☼ 10-30 mSv		2	2	7	2	2	2	1	0	0	0	0				

		References	Study Quality											
		97 (21671714)	3											
		100 (26956663)	2											
		99 (26850923)	1											
		98 (21975412)	3											
Bone scan and gallium scan hip	Usually not appropriate	Limited	☼☼☼☼ 10-30 mSv	1	1	11	1	0	1	1	0	0	0	0
		References	Study Quality											
		79 (3163533)	3											
		78 (8301279)	3											
		77 (3410621)	3											
Radiographic arthrography hip	Usually not appropriate	Expert Consensus	☼ <0.1 mSv	1	1	10	3	0	0	0	1	0	0	0
Bone scan and gallium scan with SPECT or SPECT/CT hip	Usually not appropriate	Expert Consensus	☼☼☼☼ 10-30 mSv	1	1	10	1	1	0	1	1	0	0	0

Variant 5: Symptomatic hip arthroplasty patient, infection excluded. Additional imaging following radiographs.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
MRI hip without IV contrast	Usually appropriate	Strong	0 0 mSv	0 0 mSv [ped]	8	8	0	1	0	0	2	0	4	1	6
		References	Study Quality												
		133 (15342757)	4												
		126 (16056041)	3												
		18 (23787986)	4												
		134 (25267500)	3												
		132 (31135538)	2												
		131 (22499278)	4												
		119 (31642691)	1												

41 (24908625)	2
40 (23621810)	1
39 (24954485)	3
36 (29105547)	4

US hip	May be appropriate	Strong	0 0 mSv	0 0 mSv [ped]	6	6	0	0	1	1	4	2	4	2	0
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References	Study Quality
66 (26733514)	2
41 (24908625)	2
36 (29105547)	4
51 (25582840)	3
52 (26895821)	3

CT hip without IV contrast	May be appropriate	Limited	☹☹☹ 1-10 mSv		4	4	2	2	2	6	2	0	0	0	0
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References	Study Quality
126 (16056041)	3
134 (25267500)	3

MRI hip without and with IV contrast	Usually not appropriate	Strong	0 0 mSv	0 0 mSv [ped]	3	3	3	2	4	2	1	2	0	0	0
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References	Study Quality
143 (28479059)	3
142 (30499779)	2
141 (33036841)	4
140 (32622715)	4
139 (32005623)	4
134 (25267500)	3
131 (22499278)	4
126 (16056041)	3
66 (26733514)	2
52 (26895821)	3
41 (24908625)	2

22 (22786996)

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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.