American College of Radiology ACR Appropriateness Criteria[®]

Suspected Osteomyelitis, Septic Arthritis, or Soft Tissue Infection (Excluding Spine and Diabetic Foot)

Variant 1: Suspected osteomyelitis or septic arthritis or soft tissue infection (excluding spine and diabetic foot). Initial imaging.

	Appropri	iateness	COL							F	'inal '	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RR	L Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Radiography area of interest	Usua approp		Limited	Varies	Varies	9	9	0	0	0	0	0	0	0	0	14
			References		Study	y Quality						-				
			6 (28366223)			4										
			5 (28483044)			4										
			2 (27726741)		1	4				1	1			1		
US area of interest	Usually approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	7	2	3	1	1	0	0	0	0
CT area of interest with IV contrast	Usually approp		Expert Consensus	Varies	Varies	1	1	10	0	2	1	1	0	0	0	0
CT area of interest without IV contrast	Usually approp		Expert Consensus	Varies	Varies	1	1	10	1	2	0	1	0	0	0	0
CT area of interest without and with IV contrast	Usuall ₂ approp		Expert Consensus	Varies	Varies	1	1	10	3	1	0	0	0	0	0	0
MRI area of interest without IV contrast	Usuall ₂ approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	0	3	0	0	1	0	0	0
MRI area of interest without and with IV contrast	Usually approp		Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	10	0	2	1	0	1	0	0	0

3-phase bone scan area of interest	Usually not appropriate	Expert Consensus	ତେତେ 1-10 mSv	≎≎≎≎≎ 3- 10 mSv [ped]	1	1	12	1	1	0	0	0	0	0	0	
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Variant 2: Suspected septic arthritis or soft tissue infection. Initial radiographs normal or with findings suggestive of joint effusion or soft tissue swelling. Next imaging study.

	Appropriateness				_				I	Final	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI area of interest without and with IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	1	0	4	4	5
		References		Study	Quality										
		6 (28366223)			4										
		2 (27726741)			4										
		12 (22884398)			4										
		13 (34145466)			4										
Image-guided aspiration area of interest	Usually appropriate	Limited	Varies	Varies	8	8	0	0	0	2	3	1	0	3	5
		References		Study	V Quality										
		10 (24293800)			4										
		8 (32783556)			4										
		9 (31128740)			4										
CT area of interest with IV contrast	Usually appropriate	Limited	Varies	Varies	7	7	0	0	0	0	2	5	4	2	1
		References		Study	V Quality										
		11 (18025514)			4										
		4 (-3194802)			4										
MRI area of interest without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	1	1	3	6	2	1
		References		Study	Quality										
		6 (28366223)			4										
		2 (27726741)			4										

	12 (22884398))		4										
	13 (34145466)			4										
Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	3	3	5	2	1
	References		Study	Quality		-								
	14 (22871216)			2										
May be appropriate	Limited	Varies	Varies	5	5	1	0	0	4	6	3	0	0	0
	References		Study	Quality				-						
	11 (18025514)			4										
	4 (-3194802)			4										
		ତତତ 1-10 mSv	≎≎≎≎ 3- 10 mSv [ped]	3	3	5	0	3	4	1	1	0	0	0
	References		Study	Quality										
	7 (27390160)			4										
	4 (-3194802)			4										
		Varies	Varies	1	1	8	2	4	0	0	0	0	0	0
	References		Study	v Quality	_	•		-						
	11 (18025514)		4											
	4 (-3194802)			4										
	Appropriate May be appropriate Usually no appropriate Usually no	13 (34145466) Usually appropriate Limited References 14 (22871216) May be appropriate Limited May be appropriate Limited Usually not appropriate Limited	appropriate Entitled C C C HIOV References 14 (22871216) May be appropriate Limited Varies References 11 (18025514) 4 (-3194802) 4 (-3194802) Usually not appropriate Limited References 7 (27390160) 4 (-3194802) 4 (-3194802) Usually not appropriate Limited Varies References 1 (18025514) Varies References 11 (18025514)	13 (34145466) Usually appropriate Limited O 0 mSv [ped] References Study Id (22871216) May be appropriate Limited Varies Varies May be appropriate Limited Varies Varies Usually not appropriate Limited Varies Study Usually not appropriate Limited Imited Imited	13 (34145466)4Usually appropriateLimitedO 0 mSvO 0 mSv7ReferencesStudy Quality14 (22871216)2May be appropriateLimitedVariesVaries5ReferencesStudy Quality11 (18025514)44 (-3194802)4Usually not appropriateLimitedImitedImitedImitedImitedImitedImitedUsually not appropriateLimitedImitedImitedImitedImitedImitedImitedUsually not appropriateLimitedImitedImitedImitedImitedImitedImitedUsually not appropriateLimitedImitedVariesImitedImitedImitedUsually not appropriateLimitedVariesImitedImitedImitedUsually not appropriateLimitedVariesImitedImitedImitedUsually not appropriateLimitedVariesImitedImitedUsually not appropriateLimitedVariesImitedImitedReferencesStudy QualityImitedImitedImitedUsually not appropriateLimitedVariesImitedReferencesStudy QualityImitedImitedImitedVariesImitedImitedImitedVariesImitedImitedImitedVariesImitedImitedImitedImitedIm			Image: Image		I 3 (34145466) Usually appropriate Limited O 0 mSv O 0 mSv 7 7 0 <	I 3 (34145466) Usually appropriate Limited O 0 mSv O 0 mSv [ped] 7 7 0 0 0 0 3 References Study Quality 2 7 7 0<	I 3 (34145466) Usually appropriate Limited O 0 mSv O 0 mSv 7 7 0 0 0 0 3 3 References Study Quality 2 14 (22871216) 2 5 1 0 0 4 6 3 May be appropriate Limited Varies Varies 5 5 1 0 0 4 6 3 May be appropriate Limited Varies Varies 5 5 1 0 0 4 6 3 May be appropriate Limited Varies Study Quality 4 6 3 Iteration References Study Quality 4 4 6 3 Usually not appropriate Limited Iteration Iteration 3 3 3 3 4 1 1 Usually not appropriate Limited Varies Study Quality 3 3 3 2 4 0 0 0 Usually not appropriate Limited Va	$\begin{tabular}{ c c c c c } & -13 & (34145466) & -4 & -4 & -4 & -4 & -4 & -4 & -4 & -$	

Variant 3: Suspected osteomyelitis. Initial radiographs normal or with findings suggestive of osteomyelitis. Next imaging study.

	Appropri	ateness	SOF				N. 11			F	final '	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI area of interest without and with IV contrast	Usua approp		Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	2	3	9
			References		Study	Quality										
			24 (17885058)			3										

		27 (20180105)			3										
		23 (16037509)			3										
		26 (19098186)			3										
		25 (23164978)			4										
	_	13 (34145466)			4										
MRI area of interest without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	1	0	3	6	4
		References		Stud	y Quality										
		24 (17885058)			3										
		27 (20180105)			3										
		23 (16037509)			3										
		26 (19098186)			3										
		25 (23164978)			4										
		13 (34145466)			4										
CT area of interest with IV contrast	May be appropriate	Limited	Varies	Varies	5	5	1	0	2	1	4	6	0	0	0
		References		Stud	y Quality										
		11 (18025514)			4										
CT area of interest without IV contrast	May be appropriate	Limited	Varies	Varies	5	5	0	1	3	2	5	2	1	0	0
		References		Stud	y Quality										
		11 (18025514)			4										
FDG-PET/CT area of interest	May be appropriate	Limited	ତତତତ 10-30 mSv		5	5	0	0	0	3	11	0	0	0	0
		References		Stud	y Quality										
		20 (23905618)			4										
		17 (21934545)			М										
		18 (26897336)			4										
		22 (26547722)			2										
		21 (28451827)			4										
		15 (30675635)			4										

WBC scan and sulfur colloid scan area of interest	May appropr	Limited	ତତତତ 10-3 mSv	0	5	5	0	0	1	4	9	0	0	0	0
		References		Stud	y Quality										
	Ī	18 (26897336)			4		1								
	Ī	16 (27742026)			4										
	Ī	15 (30675635)			4										
3-phase bone scan and WBC scan area of interest	May appropr	Limited	ତତତତ 10-3 mSv	0 🕸 🏵 🏵 🕏 3- 10 mSv [ped]	5	5	0	1	0	1	9	3	0	0	0
		References		Stud	y Quality										-
		17 (21934545)			М										
3-phase bone scan and WBC scan and sulfur colloid scan area of interest	May appropr	Limited	ବଟଟ 10-3 mSv	0 0 0000000000000000000000000000000000	5	5	0	0	1	2	10	1	0	0	0
		References		Stud	y Quality										
		16 (27742026)			4										
		15 (30675635)			4										
3-phase bone scan area of interest	May appropr	Limited	ତତତ 1-10 mSv	ଡେଡଡଡ 3- 10 mSv [ped]	4	4	0	0	1	7	6	0	0	0	0
		References		Stud	y Quality										
		19 (17146681)			3										
		17 (21934545)			М										
		18 (26897336)			4										
WBC scan area of interest	Usually appropr	Limited	ତତତତ 10-3 mSv	0	3	3	3	2	3	3	2	1	0	0	0
		References		Stud	y Quality										
		17 (21934545)			М										
		21 (28451827)			4										
	H	(/					4								

CT area of interest without and with IV contrast	Usuall approp		Limited	Varies		Varies	2	2	7	1	4	0	1	1	0	0	0
			References			Study	v Quality										
			11 (18025514)				4					-			_		
US area of interest	Usuall approp	y not riate	Limited	O 0 mSv	,	O 0 mSv [ped]	2	2	7	2	2	1	2	0	0	0	0
			References			Study	v Quality										
			28 (19082589)				3										

Variant 4: Suspected osteomyelitis or soft tissue infection with implanted extra-articular surgical hardware. Initial radiographs normal or with findings suggestive of osteomyelitis or soft tissue infection with implanted extra-articular surgical hardware. Next imaging study.

	Appropri	ateness	COF		-		D. (1	N7 11			F	'inal '	Tabu	latio	ns		
Procedure	Categ		SOE	Adults RR	L	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI area of interest without and with IV contrast	Usua approp		Limited	O 0 mSv		O 0 mSv [ped]	8	8	0	0	0	0	0	1	2	5	6
			References			Study	v Quality										
			27 (20180105)				3										
			32 (19255815)				4										
			31 (30683987)				4										
			21 (28451827)				4										
MRI area of interest without IV contrast	Usua approp		Limited	O 0 mSv		O 0 mSv [ped]	7	7	0	0	0	0	5	0	5	3	1
			References			Study	Quality										
			27 (20180105)				3										
			32 (19255815)				4										
			31 (30683987)				4										
			21 (28451827)				4										
CT area of interest with IV contrast	May approp	be priate	Limited	Varies		Varies	6	6	0	0	0	0	7	6	1	0	0

		References		Study	Quality										
		29 (16759307)		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	3										
		22 (26547722)			2										
		21 (28451827)			4										
CT area of interest without IV contrast	May be appropriate	Limited	Varies	Varies	5	5	0	0	1	0	13	0	0	0	0
		References		Study	Quality										-
		29 (16759307)			3										
		22 (26547722)			2										
		21 (28451827)			4										
FDG-PET/CT area of interest	May be appropriate	Limited	֎֎֎֎ 10-30 mSv		5	5	0	0	0	3	11	0	0	0	0
		References		Study	Quality		•							•	
		30 (17136411)			3										
		22 (26547722)	1		2										
		21 (28451827)			4									1	
US area of interest	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	1	2	2	2	5	1	0	0	1
		References		Study	v Quality										
		33 (14749963)			4										
		28 (19082589)			3										
WBC scan area of interest	May be appropriate	Limited	ଝେଝେଝ 10-30 mSv	ତତତତ 3- 10 mSv [ped]	4	4	0	0	2	7	5	0	0	0	0
		References		Study	v Quality										
		21 (28451827)		_	4							-	-		
WBC scan and sulfur colloid scan area of interest	May be appropriate	Expert Consensus	ତତତତ 10-30 mSv	≎≎≎≎≎ 3- 10 mSv [ped]	4	4	0	0	1	7	6	0	0	0	0
3-phase bone scan and WBC scan area of interest	May be appropriate	Limited	ଡଡଡଡ 10-30 mSv	֎֎֎֎ 3- 10 mSv	4	4	4	1	2	3	3	0	0	0	1
	appropriate			[ped]											

		21 (28451827)			4										
3-phase bone scan area of interest	Usuall approp	Limited	ଡେଡଡ 1-10 mSv	���� 3- 10 mSv [ped]	3	3	5	1	3	2	2	0	1	0	0
		References		Study	y Quality										
		19 (17146681)			3										
		17 (21934545)			М										
		21 (28451827)			4			-	-	_		-			
CT area of interest without and with IV contrast	Usuall approp	Limited	Varies	Varies	1	1	8	3	3	0	0	0	0	0	0
		References		Study	y Quality										
		29 (16759307)			3										
		22 (26547722)			2										
		21 (28451827)			4										
3-phase bone scan and WBC scan and sulfur colloid scan area of interest	Usuall approp	Expert Consensus	ଡଡଡଡ 10-30 mSv	&&&& 10-30 mSv [ped]	1	1	8	1	2	1	0	1	0	1	0
Image-guided aspiration area of interest	Usuall approp	Expert Consensus	Varies	Varies	1	1	9	2	3	0	0	0	0	0	0

Variant 5: Suspected septic arthritis with arthroplasty or other implanted intra-articular surgical hardware. Initial radiographs normal or with findings suggestive of septic arthritis with arthroplasty or other implanted intra-articular surgical hardware. Next imaging study.

	Appropriatenes	\$			D. (F	inal	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
Image-guided aspiration area of interest	Usually appropriate	Limited	Varies	Varies	9	9	0	0	1	1	0	0	0	2	10
		References		Study	y Quality										
		31 (30683987))		4										
		39 (28932957))		3										
		38 (31056444))		2										

MRI area of interest without and with IV contrast	Usually appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	2	2	7	3
		References		Study	Quality										
		41 (14684523)		-	3										
		43 (19132424)			4										
		32 (19255815)			4										
		42 (31642691)			1										
		21 (28451827)			4										
CT area of interest with IV contrast	Usually appropriate	Limited	Varies	Varies	7	7	0	0	1	0	3	3	5	2	0
		References		Study	Quality										
		11 (18025514)			4										
		31 (30683987)			4										
		21 (28451827)			4										
MRI area of interest without IV contrast	Usually appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	3	1	6	4	0
		References		Study	Quality										
		41 (14684523)			3										
		43 (19132424)			4										
		32 (19255815)			4										
		42 (31642691)			1										
		21 (28451827)			4										
CT area of interest without IV contrast	May be appropriate	Limited	Varies	Varies	5	5	0	0	0	2	10	2	0	0	0
		References		Study	Quality										
		11 (18025514)			4										
		31 (30683987)			4										
		21 (28451827)			4										
US area of interest	May be	Limited	O 0 mSv	O 0 mSv	5	5	0	0	0	5	9	0	0	0	0
	appropriate	Linitoa		[ped]	U			Ŭ	Ŭ	Ũ	-	Ŭ	Ŭ		

		33 (14749963)			4										
		28 (19082589)			3										
FDG-PET/CT area of interest	May be appropriate	Limited	ବବବବ 10-30 mSv		4	4	4	0	3	2	4	0	1	0	0
		References		Stud	y Quality										
		36 (27707850)		Ina	dequate										
		40 (31365498)			4					_					
WBC scan area of interest	May be appropriate	Limited	֎֎֎֎ 10-30 mSv	֎֎֎֎ 3- 10 mSv [ped]	4	4	0	0	2	6	6	0	0	0	0
		References		Stud	y Quality										
		45 (19958846)			4										
		34 (26706230)			3										
		36 (27707850)		Ina	dequate										
WBC scan and sulfur colloid scan area of interest	May be appropriate	Limited	֎֎֎֎ 10-30 mSv	&&&& 3- 10 mSv [ped]	4	4	0	0	1	8	5	0	0	0	0
		References		Stud	y Quality										
		36 (27707850)		Ina	dequate										
		44 (28555449)			3										
3-phase bone scan and WBC scan area of interest	May be appropriate	Limited	ଡ≎ତତ 10-30 mSv	֎֎֎֎ 3- 10 mSv [ped]	4	4	5	0	1	3	4	0	0	0	1
		References		Stud	y Quality										
		34 (26706230)			3					_					
3-phase bone scan and WBC scan and sulfur colloid scan area of interest	Usually not appropriate	Expert Consensus	ଡଡଡଡ 10-30 mSv	ତତତତତ 10-30 mSv [ped]	2	2	7	2	0	2	1	1	0	1	0
CT area of interest without and with IV contrast	Usually not appropriate	Limited	Varies	Varies	1	1	10	3	1	0	0	0	0	0	0
		References		Stud	y Quality										
		11 (18025514)			4										
		31 (30683987)			4										

			21 (28451827)			4										
3-phase bone scan area of interest	Usuall approp		Limited	ତତତ 1-1(mSv)	1	1	8	0	4	2	0	0	0	0	0
			References		Study	y Quality										
			34 (26706230)			3										
			36 (27707850)		Inac											
			35 (28969761)		4											
		37 (30888518)				3										

Variant 6: Suspected soft tissue infection. History of puncture wound with possible retained foreign body. Radiographs normal. Next imaging study.

	Appropri	ateness								F	'inal '	Tabu	latio	ıs		
Procedure	Categ	gory	SOE	Adults RR	L Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
US area of interest	Usua approp		Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	1	0	0	1	5	7
			References		Stud	y Quality										
			47 (24951233)			4										
			46 (33136481)			4										
			48 (29426979)			2					_					
CT area of interest with IV contrast	Usua approp		Limited	Varies	Varies	7	7	0	0	0	0	3	2	4	1	4
			References		Stud	y Quality										
			47 (24951233)			4										
			46 (33136481)			4					_					
CT area of interest without IV contrast	Usua approp		Limited	Varies	Varies	7	7	0	0	0	0	3	1	7	1	2
			References		Stud	y Quality										
			47 (24951233)			4										
			46 (33136481)			4										

CT area of interest without and with IV contrast	Usual appropr				Varies	7	7	0	0	1	1	4	1	5	1	1
			References		Study	y Quality										
			47 (24951233)			4										
			46 (33136481)		4					-	-					
MRI area of interest without IV contrast	Usual approp		Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	2	3	2	4	3	0
			References		Study	Quality										
			47 (24951233)			4										
			46 (33136481)			4			-		-	-				
MRI area of interest without and with IV contrast	Usual appropr		Limited	O 0 mSv	O 0 mSv [ped]	7	7	0	0	0	0	3	2	5	3	1
		References		Study Quality												
		47 (24951233)		4												
			46 (33136481)			4]								

Variant 7: Suspected soft tissue infection. Initial radiographs show soft tissue gas (without puncture wound) or are normal with high clinical suspicion of necrotizing fasciitis. Next imaging study.

	Appropriate	eness	COF		.		D. (1	N. 11]	Final	Tabı	ilatio	ons		
Procedure	Category	·у	SOE	Adults RR	L	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
CT area of interest without IV contrast	Usually appropriat		Moderate	Varies		Varies	9	9	0	0	0	0	0	1	3	3	7
			References			Study	Quality										
			6 (28366223)				4										
			51 (26286006)				3										
			49 (25539248)				4										
			52 (29537292)				4										
			2 (27726741)				4										
			54 (29672405)			C	lood										

		53 (9169717)			4										
		55 (29211672)		<u>_</u>	4							-			
CT area of interest with IV contrast	Usually appropriate	Moderate	Varies	Varies	8	8	0	0	0	0	0	3	4	2	5
		References		Study	v Quality										
		6 (28366223)			4										
		51 (26286006)			3										
		49 (25539248)			4										
		52 (29537292)			4										
		2 (27726741)			4										
		54 (29672405)		0	Good										
		53 (9169717)			4										
		55 (29211672)			4										
MRI area of interest without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	0	7	4	3
		References		Study	v Quality										
		50 (30887193)			2										
		49 (25539248)			4										
		52 (29537292)			4										
		2 (27726741)			4										
		54 (29672405)		(Good										
		56 (21406630)			3										
		57 (23043899)			4										
		58 (9490940)			3						1				
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	0	2	8	4
		References		Study	Quality					•					
		50 (30887193)			2										
		49 (25539248)			4										
		52 (29537292)			4										
		2 (27726741)			4										

		54 (29672405)			Good										
		56 (21406630)			3										
		57 (23043899)			4										
		58 (9490940)			3										
US area of interest	May be appropriate	Limited	O 0 mSv	O 0 mSv [ped]	5	5	0	0	0	1	13	0	0	0	0
		References		Study	/ Quality										
		60 (31031033)			3										
		52 (29537292)			4										
		57 (23043899)			4										
		59 (-3194804)			4										
		61 (24578776)			4										
		62 (21480291)		1	4										
CT area of interest without and with IV contrast	Usually not appropriate	Moderate	Varies	Varies	1	1	12	1	1	0	0	0	0	0	0
		References		Study	/ Quality										
		6 (28366223)			4										
		51 (26286006)			3										
		49 (25539248)			4										
		52 (29537292)			4										
		2 (27726741)			4										
		54 (29672405)		C	Good										
		53 (9169717)			4										
		55 (29211672)			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.