American College of Radiology ACR Appropriateness Criteria[®]

Chronic Knee Pain

Variant 1: Adult or child greater than or equal to 5 years of age. Chronic knee pain. Initial imaging.

	Appropri	ateness	005							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 knee	Usua approp		Moderate	發 < 0.1 mS	v	9	9	0	0	0	0	0	0	0	0	16
			References		Study	y Quality										
			10 (24751528)			4										
			11 (26797169)			4										
			12 (23118113)			2										
			13 (22438445)			3		_		_		-				
CT arthrography knee	Usually approp		Expert Consensus	≎ < 0.1 mS	v 0.03- 0.3 mSv [ped]	1	1	15	0	0	0	1	0	0	0	0
CT knee with IV contrast	Usually approp		Expert Consensus	≎ < 0.1 mS	v 0.03- [ped]	1	1	15	0	0	0	1	0	0	0	0
CT knee without IV contrast	Usually approp		Expert Consensus	≎ < 0.1 mS	v 0.03- 0.3 mSv [ped]	1	1	11	1	1	2	0	1	0	0	0
CT knee without and with IV contrast	Usually approp		Expert Consensus	≎ < 0.1 mS	v 0.3 mSv [ped]	1	1	15	0	0	0	1	0	0	0	0
Image-guided aspiration knee	Usually approp		Expert Consensus	Varies	Varies	1	1	14	0	1	1	0	0	0	0	0

MR arthrography knee	Usually approp	Expert Consensus	O 0 mSv		0 mSv ped]	1	1	14	1	0	0	1	0	0	0	0
MRI knee without IV contrast	Usually approp	Limited	O 0 mSv		0 mSv ped]	1	1	11	0	2	2	0	0	0	1	0
		References			Study	Quality										
		2 (25086957)				4										
MRI knee without and with IV contrast	Usually approp	Limited	O 0 mSv		0 mSv ped]	1	1	13	0	2	0	0	0	1	0	0
		References		·	Study	Quality										
		2 (25086957)				4										
Bone scan knee	Usually approp	Expert Consensus	≎≎≎≎ 1-1(mSv	D		1	1	13	2	1	0	0	0	0	0	0
US knee	Usually approp	Expert Consensus	O 0 mSv		0 mSv ped]	1	1	12	1	1	0	2	0	0	0	0
Radiography hip ipsilateral	Usually approp	Expert Consensus	ଝେଝ 1-1(mSv	3	● 0.3- mSv ped]	1	1	11	0	1	1	2	0	1	0	0

Variant 2: Adult or child greater than or equal to 5 years of age. Chronic knee pain. Initial knee radiograph negative or demonstrates joint effusion. Next imaging procedure.

	Appropri	iateness	COL			D. (I	Final	Tabu	latio	ns		
Procedure	Categ	gory	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI knee without IV contrast	Usua approp		Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	2	4	10
			References		Study	Quality										
			21 (18784100)			4										
			28 (28473086)			4										
			11 (26797169)			4										
			13 (22438445)			3										
			15 (25442030)			4										

	-				1												
			17 (21647860)				2										
			18 (23321609)				4										
			19 (22736267)				2										
			20 (22012846)				4										
			22 (25022807)				2										
			23 (24020939)				2										
			24 (23377800)				2										
			25 (20829200)				4										
			26 (21360498)				2										
			27 (26290325)				3										
			29 (23845401)				3										
			30 (24583066)				2										
			31 (25724258)				3										
			32 (22421281)				2										
			33 (21969432)				4										
			34 (24651059)				4										
			35 (23982988)				2										
			36 (22184170)				4										
			37 (20418103)				4										
			38 (24119160)				2										
			39 (21618936)				4										
			40 (22862803)				4										
			41 (23478924)				4										
			42 (20884045)				4										
			43 (22488011)				4										
			44 (22134205)				4										
			45 (26242763)				2									,	
CT arthrography knee	May l appropr	be riate	Limited	֎ <0.1 m\$	Sv	�� 0.03- 0.3 mSv [ped]	5	5	1	0	0	3	5	5	1	1	0
			References			Study	v Quality										
			16 (22447237)				4										

CT knee without IV contrast	May appropri		Limited	≎ <0.1 mSv	≎≎ 0.03- 0.3 mSv [ped]	5	5	0	1	0	1	11	4	0	0	0
			References		Study	/ Quality										
			15 (25442030)			4										
Image-guided aspiration knee	May appropri		Limited	Varies	Varies	5	5	1	0	0	1	12	3	0	0	0
			References		Study	Quality										
			10 (24751528)			4					-	-				
US knee	May l appropr (Disagree	riate	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	1	1	1	1	8	2	2	1	0
			References		Study	Quality										
			10 (24751528)			4										
			17 (21647860)			2										
			37 (20418103)			4										
			44 (22134205)			4										
			49 (22996306)		-	2				-						
Radiography hip ipsilateral	May appropr		Limited	ତେତେ 1-10 mSv	֎֎֎ 0.3- 3 mSv [ped]	5	5	2	1	0	2	10	1	1	0	0
			References		Study	/ Quality										
			14 (23781753)		_	4						-				
Radiography lumbar spine	May l appropr		Expert Consensus	ଝେଙ୍କ 1-10 mSv	�� 0.03- 0.3 mSv [ped]	5	5	3	1	0	1	11	0	1	0	0
MR arthrography knee	May l appropr		Limited	O 0 mSv	O 0 mSv [ped]	4	4	6	0	2	6	3	0	0	0	0
			References		Study	/ Quality										
			10 (24751528)			4										
MRI knee without and with IV contrast	Usually appropr		Strong	O 0 mSv	O 0 mSv [ped]	2	2	8	1	1	2	2	1	1	0	0
			References		Study	Quality			•		•	•				

			15 (25442030)			4										
			17 (21647860)			2										
			42 (20884045)			4										
			46 (23277189)			2										
			47 (21187293)			2										
			48 (25278070)			2							-			
CT knee with IV contrast	Usually approp	y not priate	Limited	& <0.1 mSv	&⊛ 0.03- 0.3 mSv [ped]	1	1	13	1	0	1	1	0	0	0	0
			References		Study	Quality										
			15 (25442030)			4										
CT knee without and with IV contrast	Usually approp	y not priate	Limited	發 < 0.1 mSv	&⊛ 0.03- 0.3 mSv [ped]	1	1	12	1	0	2	1	0	0	0	0
			References		Study	Quality										
			15 (25442030)			4										
Bone scan knee	Usually approp	y not oriate	Expert Consensus	≎≎≎≎ 1-10 mSv		1	1	12	3	0	0	1	0	0	0	0

Variant 3: Adult or child greater than or equal to 5 years of age. Chronic knee pain. Initial knee radiograph demonstrates osteochondritis dissecans (OCD), loose bodies, or history of cartilage or meniscal repair. Next imaging procedure.

	Appropriatenes				D. (J	Final	Tabu	latio	ns		
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI knee without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	3	1	12
		References		Study	Quality										
		50 (18552309)			3										
		41 (23478924))		4										
		51 (24856089))		2										
		52 (21327672))		2										
		53 (24685525))		2										

	_	54 (24048551)			1										
CT arthrography knee	May be appropriate	Limited	≎ < 0.1 mSv	�� 0.03- 0.3 mSv [ped]	6	6	1	0	0	1	4	3	5	2	0
		References		Study	y Quality										
		16 (22447237)			4										
CT knee without IV contrast	May be appropriate	Expert Consensus	⊕<0.1 mSv	�� 0.03- 0.3 mSv [ped]	5	5	0	0	1	1	11	4	0	0	0
MR arthrography knee	May be appropriate (Disagreement)	Expert Opinion	O 0 mSv	O 0 mSv [ped]	5	5	3	0	0	2	7	4	1	0	0
		References		Study	y Quality										
		10 (24751528)			4										
		16 (22447237)			4									-	
US knee	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	2	2	7	8	0	0	1	1	0	0	0
CT knee with IV contrast	Usually not appropriate	Expert Consensus	⊛ <0.1 mSv	�� 0.03- 0.3 mSv [ped]	1	1	11	3	0	2	0	0	0	0	0
CT knee without and with IV contrast	Usually not appropriate	Expert Consensus	⅌ < 0.1 mSv	�� 0.03- 0.3 mSv [ped]	1	1	13	1	1	1	0	0	0	0	0
Image-guided aspiration knee	Usually not appropriate	Expert Consensus	Varies	Varies	1	1	13	1	0	2	0	0	0	0	0
MRI knee without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	11	2	0	1	1	1	0	0	0
		References		Study	y Quality										
		16 (22447237)			4				-						
Bone scan knee	Usually not appropriate	Expert Consensus	֎֎֎ 1-10 mSv		1	1	14	2	0	0	0	0	0	0	0
Radiography hip ipsilateral	Usually not appropriate	Expert Consensus	ତତତ 1-10 mSv	≎≎≎ 0.3- 3 mSv [ped]	1	1	12	2	1	1	0	0	0	0	0

	Appropriateness														
Procedure	Category	SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI knee without IV contrast	May be appropriate	Strong	O 0 mSv	O 0 mSv [ped]	6	6	1	0	0	1	1	6	2	3	2
		References		Study	Quality			•							
		58 (20360517)			3										
		10 (24751528)			4										
		11 (26797169)													
		11 (26797169) 4 18 (23321609) 4													
		19 (22736267)			2										
		55 (26316262)			3										
		56 (24418678)			2										
		57 (25746322)			2										
		59 (24821663)			3		_	-			-	1	1		
Image-guided aspiration knee	May be appropriate (Disagreement)	Expert Opinion	Varies	Varies	5	5	3	1	0	2	7	4	0	0	0
		References		Study	V Quality										
		61 (26116548)			2			_	_	_	- <u>-</u>		_	_	
CT knee without IV contrast	May be appropriate	Expert Consensus	發 < 0.1 mSv	&⊛ 0.03- 0.3 mSv [ped]	4	4	5	1	2	1	7	1	0	0	0
MRI knee without and with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	2	2	8	1	1	2	2	1	1	0	0
		References		Study	Quality										
		58 (20360517)			3										
		10 (24751528)			4										
		11 (26797169)			4										

Variant 4: Adult or child greater than or equal to 5 years of age. Chronic knee pain. Initial knee radiograph demonstrates degenerative changes or chondrocalcinosis. Next imaging procedure.

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		 18 (23321609)			4										
	_	19 (22736267)			2										
		55 (26316262)			3										
		56 (24418678)			2										
	_	57 (25746322)			2										
		59 (24821663)			3					-	-				
US knee	Usually approp	Limited	O 0 mSv	O 0 mSv [ped]	2	2	7	2	0	3	5	0	0	0	0
		References		Study	y Quality										
		11 (26797169)			4										
		60 (25691769)			1									-	
CT arthrography knee	Usually appropri	Limited	發 < 0.1 mSv	&	1	1	10	0	0	3	3	0	1	0	0
		References		Study	Quality										
		11 (26797169)			4										
CT knee with IV contrast	Usually appropri	Expert Consensus	發 < 0.1 mSv	�� 0.03- 0.3 mSv [ped]	1	1	12	1	2	1	0	0	0	0	0
CT knee without and with IV contrast	Usually appropr	Expert Consensus	發 < 0.1 mSv	 	1	1	12	1	1	2	0	0	0	0	0
MR arthrography knee	Usually appropr	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	1	0	0	1	1	0	0	0
Bone scan knee	Usually appropr	Limited	≎≎≎ 1-10 mSv		1	1	10	2	2	1	1	0	0	0	0
		References		Study	Quality										
		11 (26797169)			4				-						
Radiography hip ipsilateral	Usually appropri	Expert Consensus	ଝେଝ 1-10 mSv	��� 0.3- 3 mSv [ped]	1	1	12	1	1	0	2	0	0	0	0

	Appropriat	eness	005							F	'inal '	Tabu	latio	ns		
Procedure	Categor		SOE	Adults RRL	Peds RRL	Rating	Median	1	2	3	4	5	6	7	8	9
MRI knee without IV contrast	Usually appropria	7 ate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	2	2	3	9
			References		Study	Quality		-								
			41 (23478924)			4										
			65 (20978758)			2										
CT arthrography knee	May be appropria		Strong	& <0.1 mSv	&⊛ 0.03- 0.3 mSv [ped]	5	5	0	0	0	2	7	5	2	1	0
			References		Study	Quality										
			63 (11997545)			2										
			16 (22447237)			4										
			62 (18329214)			2										
			64 (10966722)	[ped] [ped] es Study Quality 545) 2 237) 4 214) 2 722) 2												
CT knee without IV contrast	May be appropria		Limited	發 < 0.1 mSv	&⊛ 0.03- 0.3 mSv [ped]	5	5	0	0	0	2	13	2	0	0	0
		·	References		Study	Quality										•
			15 (25442030)			4										
CT knee with IV contrast	Usually n appropria		Limited	發 < 0.1 mSv	≎≎ 0.03- 0.3 mSv [ped]	1	1	13	1	0 0 2 7 5 0 0 2 13 2 1 0 1 0 1	0	0	0			
			References		Study	Quality										
			15 (25442030)			4										
CT knee without and with IV contrast	Usually n appropria		Limited	€ <0.1 mSv	&⊛ 0.03- 0.3 mSv [ped]	1	1	13	1	0	1	0	2 2 5 2 2 0 1 0	0	0	
			References		Study	V Quality										

Variant 5: Adult or child greater than or equal to 5 years of age. Chronic knee pain. Initial knee radiograph demonstrates signs of prior osseous injury (ie, Segond fracture, tibial spine avulsion, etc.). Next imaging procedure.

		15 (25442030)				4										
Image-guided aspiration knee	Usuall approp	Expert Consensus	Varies		Varies	1	1	14	0	1	1	0	0	0	0	0
MR arthrography knee	Usuall approp	Expert Consensus	O 0 mSv	/	O 0 mSv [ped]	1	1	11	1	1	1	0	1	1	0	0
MRI knee without and with IV contrast	Usuall approp	Limited	O 0 mSv	/	O 0 mSv [ped]	1	1	12	1	1	0	2	0	0	0	0
		References			Study	Quality										
		41 (23478924)				4										
		65 (20978758)				2		_		-	-		-			
Bone scan knee	Usuall approp	Expert Consensus	ତେତେ 1-1 mSv	0		1	1	13	1	1	0	0	1	0	0	0
US knee	Usuall approp	Expert Consensus	O 0 mSv	/	O 0 mSv [ped]	1	1	12	2	1	1	0	0	0	0	0
Radiography hip ipsilateral	Usuall approp	Expert Consensus	ତତତ 1-1 mSv	0	≎≎≎ 0.3- 3 mSv [ped]	1	1	12	2	0	0	1	0	0	1	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.