American College of Radiology
ACR Appropriateness Criteria®

Chronic Elbow Pain

Variant 1: Chronic elbow pain. Initial imaging.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations								
							1	2	3	4	5	6	7	8	9
Radiography elbow	Usually appropriate	Limited	☢ <0.1 mSv		9	9	0	0	0	0	0	0	0	1	13

References	Study Quality
5 (11940640)	4
7 (9617407)	4
4 (12783223)	3
6 (32305107)	4

CT arthrography elbow	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	13	0	1	0	0	0	0	0	0
CT elbow with IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	13	0	1	0	0	0	0	0	0
CT elbow without IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	11	0	1	0	2	0	0	0	0
CT elbow without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	13	0	0	0	1	0	0	0	0
MR arthrography elbow	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	0	0	0	1	0	0	0	0
MRI elbow without IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	0	0	1	2	0	0	0	0

MRI elbow without and with IV contrast	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	13	0	0	0	1	0	0	0	0
US elbow	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	0	2	1	2	0	0	0	0
3-phase bone scan elbow	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	0	0	0	0

Variant 2: Chronic elbow pain with mechanical symptoms such as locking, clicking, or limited range of motion. Suspect intra-articular pathology such as osteocartilaginous body, osteochondral lesion, or synovial abnormality. Radiographs normal or nonspecific. 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 elbow without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	4	9

References	Study Quality
12 (8180456)	3
17 (8946538)	4
16 (22929044)	2
18 (11000172)	3
15 (30016689)	4

CT elbow without IV contrast	Usually appropriate	Limited	☢☢ 0.1-1mSv		8	8	0	0	0	0	3	1	2	5	3

References	Study Quality
10 (20489071)	2

MR arthrography elbow	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	3	1	2	4	4

References	Study Quality
12 (8180456)	3
13 (10708607)	4
14 (12235350)	4

		16 (22929044)		2												
		15 (30016689)		4												
CT arthrography elbow	Usually appropriate	Limited	☢☢ 0.1-1mSv		7	7	0	0	0	1	1	3	3	3	3
		References		Study Quality												
		10 (20489071)		2												
		11 (16315115)		4												
US elbow	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	3	3	5	1	4	1	2	1	0	0	0
		References		Study Quality												
		10 (20489071)		2												
CT elbow with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	14	0	0	0	0	0	0	0	0
		References		Study Quality												
		10 (20489071)		2												
CT elbow without and with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	14	0	0	0	0	0	0	0	0
		References		Study Quality												
		10 (20489071)		2												
MRI elbow without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	14	0	0	0	0	0	0	0	0
		References		Study Quality												
		12 (8180456)		3												
		17 (8946538)		4												
		16 (22929044)		2												
		18 (11000172)		3												
		15 (30016689)		4												
3-phase bone scan elbow	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	13	1	0	0	0	0	0	0	0
		References		Study Quality												

9 (11884494)	4
8 (6215609)	4

Variant 3: Chronic elbow pain. Suspect occult stress fracture or other bone abnormality. Radiographs normal or nonspecific. 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 elbow without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	0	13
References				Study Quality											
20 (16798139)				4											
CT elbow without IV contrast	Usually appropriate	Limited	☢☢ 0.1-1mSv		8	8	0	0	0	0	4	2	1	4	3
References				Study Quality											
20 (16798139)				4											
22 (15164781)				4											
3-phase bone scan elbow	May be appropriate (Disagreement)	Expert Opinion	☢☢☢ 1-10 mSv		5	5	1	1	0	1	5	2	2	0	2
References				Study Quality											
20 (16798139)				4											
21 (19668095)				3											
19 (-3194390)				4											
CT arthrography elbow	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	9	1	3	0	0	0	1	0	0
CT elbow with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	9	0	1	0	2	1	0	1	0
References				Study Quality											
20 (16798139)				4											
22 (15164781)				4											

CT elbow without and with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	9	0	1	0	3	0	0	1	0
		References		Study Quality											
		20 (16798139)		4											
		22 (15164781)		4											
MR arthrography elbow	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	9	1	2	1	1	0	0	0	0
MRI elbow without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	9	0	1	0	3	1	0	0	0
		References		Study Quality											
		20 (16798139)		4											
US elbow	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	9	0	3	0	1	0	0	1	0
		References		Study Quality											
		23 (18626636)		2											

Variant 4: Chronic elbow pain. Suspect chronic epicondylalgia or tendon tear. Refractory to empirical treatment. Radiographs normal or nonspecific. 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 elbow without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	0	13
		References		Study Quality											
		28 (15711999)		4											
		30 (19942363)		3											
		27 (11981928)		1											
		29 (29027008)		3											
		26 (31040053)		2											
US elbow	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	0	0	5	4	5

References	Study Quality
35 (23255757)	3
33 (28850740)	2
34 (29177701)	3
31 (28749994)	2
32 (25189955)	3

CT arthrography elbow	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	12	0	0	1	1	0	0	0	0
CT elbow with IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	12	0	0	0	1	1	0	0	0
CT elbow without IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	10	0	2	0	1	1	0	0	0
CT elbow without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	12	0	0	0	2	0	0	0	0
MR arthrography elbow	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	8	1	0	3	1	1	0	0	0

References	Study Quality
25 (11414155)	4

MRI elbow without and with IV contrast	Usually not appropriate	Moderate	O 0 mSv	O 0 mSv [ped]	1	1	13	1	0	0	0	0	0	0	0

References	Study Quality
28 (15711999)	4
30 (19942363)	3
27 (11981928)	1
29 (29027008)	3
26 (31040053)	2

3-phase bone scan elbow	Usually not appropriate	Limited	☢☢☢ 1-10 mSv		1	1	9	1	3	0	1	0	0	0	0

References	Study Quality
24 (18996248)	2

Variant 5: Chronic elbow pain. Suspect collateral ligament tear. Radiographs normal or nonspecific. Next imaging study.

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations 1	2	3	4	5	6	7	8	9
MR arthrography elbow	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	1	0	1	12

References	Study Quality
40 (15480640)	4
43 (9205244)	4
37 (7568841)	2
41 (9673644)	4
38 (25539278)	3
42 (30699009)	3
44 (26095056)	3
39 (27183408)	2

CT arthrography elbow	Usually appropriate	Limited	☢☢ 0.1-1mSv		8	8	0	0	0	0	1	1	5	3	4

References	Study Quality
36 (32735456)	4

MRI elbow without IV contrast	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	1	1	2	2	3	5

References	Study Quality
38 (25539278)	3

US elbow	Usually appropriate	Limited	O 0 mSv	O 0 mSv [ped]	8	8	0	0	0	0	1	1	3	6	3

References	Study Quality
47 (8956595)	4
46 (32067711)	2
36 (32735456)	4

Radiography elbow stress views	May be appropriate	Limited	☢ <0.1 mSv		5	5	0	0	0	1	7	4	2	0	0
	References		Study Quality												
	45 (29322208)		3												
	6 (32305107)		4												
CT elbow with IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	12	0	0	1	0	1	0	0	0
CT elbow without IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	11	1	0	0	1	1	0	0	0
CT elbow without and with IV contrast	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	12	0	0	1	0	1	0	0	0
MRI elbow without and with IV contrast	Usually not appropriate	Limited	O 0 mSv	O 0 mSv [ped]	1	1	14	0	0	0	0	0	0	0	0
	References		Study Quality												
	38 (25539278)		3												
3-phase bone scan elbow	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	13	0	0	0	1	0	0	0	0

Variant 6: Chronic elbow pain. Suspect nerve abnormality. Radiographs normal or nonspecific. 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 elbow without IV contrast	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	1	3	10
	References		Study Quality												
	50 (21845447)		3												
	54 (8079837)		4												
	55 (15172385)		4												
	51 (16481216)		3												
	47 (8956595)		4												

		48 (28842238)	2												
		52 (29602661)	3												
		53 (29622409)	3												
		49 (25680717)	1												
US elbow	Usually appropriate	Strong	O 0 mSv	O 0 mSv [ped]	9	9	0	0	0	0	0	0	3	4	7
		References	Study Quality												
		61 (15179657)	3												
		60 (11526255)	4												
		48 (28842238)	2												
		56 (28888384)	Good												
		62 (28987654)	4												
		57 (31137210)	3												
		59 (31568902)	3												
		63 (29858636)	1												
		58 (30130723)	3												
		64 (30245016)	3												
CT elbow without IV contrast	May be appropriate	Limited	☢☢ 0.1-1mSv		5	5	3	1	1	1	8	0	0	0	0
		References	Study Quality												
		47 (8956595)	4												
MRI elbow without and with IV contrast	Usually not appropriate	Strong	O 0 mSv	O 0 mSv [ped]	3	3	6	0	4	0	3	0	1	0	0
		References	Study Quality												
		50 (21845447)	3												
		54 (8079837)	4												
		55 (15172385)	4												
		51 (16481216)	3												
		47 (8956595)	4												
		48 (28842238)	2												
		52 (29602661)	3												

		53 (29622409)		3											
		49 (25680717)		1											
CT arthrography elbow	Usually not appropriate	Expert Consensus	☢☢ 0.1-1mSv		1	1	12	1	0	0	1	0	0	0	0
CT elbow with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	11	0	0	0	1	1	1	0	0
		References		Study Quality											
		47 (8956595)		4											
CT elbow without and with IV contrast	Usually not appropriate	Limited	☢☢ 0.1-1mSv		1	1	11	0	0	0	2	0	1	0	0
		References		Study Quality											
		47 (8956595)		4											
MR arthrography elbow	Usually not appropriate	Expert Consensus	O 0 mSv	O 0 mSv [ped]	1	1	11	0	2	0	1	0	0	0	0
3-phase bone scan elbow	Usually not appropriate	Expert Consensus	☢☢☢ 1-10 mSv		1	1	14	0	0	0	0	0	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.**