

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

Shoulder Pain-Atraumatic

Variant 1: Atraumatic shoulder 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 shoulder	Usually appropriate		⊕ <0.1 mSv		9	9	0	0	0	0	0	0	0	0	16
CT arthrography shoulder	Usually not appropriate		⊕⊕⊕⊕ 10-30 mSv		1	1	15	0	1	0	0	0	0	0	0
CT shoulder with IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	15	0	1	0	0	0	0	0	0
CT shoulder without IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	13	1	1	1	0	0	0	0	0
CT shoulder without and with IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	16	0	0	0	0	0	0	0	0
X-ray arthrography shoulder	Usually not appropriate		⊕ <0.1 mSv		1	1	16	0	0	0	0	0	0	0	0
MR arthrography shoulder	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	14	0	1	0	1	0	0	0	0
MRI shoulder without IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	12	0	0	1	1	2	0	0	0
MRI shoulder without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	14	0	1	1	0	0	0	0	0

US shoulder	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	12	1	1	1	0	1	0	0	0
-------------	-------------------------	--	---------	---------------	---	---	----	---	---	---	---	---	---	---	---

Variant 2: Atraumatic shoulder pain. Suspect rotator cuff disorders (tendinosis, tear, calcific tendinitis). Initial 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 shoulder without IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	0	0	3	13
US shoulder	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	8	8	1	0	0	0	2	0	3	4	6
MR arthrography shoulder	May be appropriate		○ 0 mSv	○ 0 mSv [ped]	6	6	0	0	2	0	6	5	2	0	1
CT arthrography shoulder	May be appropriate		☼☼☼☼ 10-30 mSv		5	5	0	0	0	2	12	2	0	0	0
Radiography shoulder additional views	Usually not appropriate		☼ <0.1 mSv		2	2	7	5	0	0	3	0	0	0	1
CT shoulder with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0
CT shoulder without IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	10	1	1	0	2	1	1	0	0
CT shoulder without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	16	0	0	0	0	0	0	0	0
X-ray arthrography shoulder	Usually not appropriate		☼ <0.1 mSv		1	1	9	1	0	4	1	0	1	0	0
MRI shoulder without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	14	0	1	0	1	0	0	0	0

Variant 3: Atraumatic shoulder pain. Suspect labral tear and instability. Initial 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
MR arthrography shoulder	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	0	1	3	12
MRI shoulder without IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	8	8	1	0	0	0	2	1	4	4	4
CT arthrography shoulder	May be appropriate		⊕⊕⊕⊕ 10-30 mSv		6	6	0	0	0	0	7	8	1	0	0
CT shoulder with IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0
CT shoulder without IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	14	0	1	0	0	0	1	0	0
CT shoulder without and with IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0
X-ray arthrography shoulder	Usually not appropriate		⊕ <0.1 mSv		1	1	14	1	0	0	0	1	0	0	0
MRI shoulder without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	14	0	2	0	0	0	0	0	0
US shoulder	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	10	1	1	2	2	0	0	0	0
Radiography shoulder additional views	Usually not appropriate		⊕ <0.1 mSv		1	1	9	4	0	1	0	1	1	0	0

Variant 4: Atraumatic shoulder pain. Suspect bursitis. Initial 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 shoulder without IV contrast	Usually		○ 0 mSv	○ 0 mSv	9	9	1	0	0	0	0	0	1	2	12

Procedure	Appropriateness Category	SOE	Adults RRL	Peds RRL	Rating	Median	Final Tabulations											
							1	2	3	4	5	6	7	8	9			
	appropriate			[ped]														
US shoulder	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	1	0	3	3	9			
CT arthrography shoulder	Usually not appropriate		☼☼☼☼ 10-30 mSv		1	1	14	0	2	0	0	0	0	0	0			
CT shoulder with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	14	1	0	0	1	0	0	0	0			
CT shoulder without IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	14	0	1	0	1	0	0	0	0			
CT shoulder without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0			
X-ray arthrography shoulder	Usually not appropriate		☼ <0.1 mSv		1	1	15	1	0	0	0	0	0	0	0			
MR arthrography shoulder	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	13	0	1	1	1	0	0	0	0			
MRI shoulder without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	15	0	0	1	0	0	0	0	0			

Variant 5: Atraumatic shoulder pain. Suspect adhesive capsulitis. Initial 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 shoulder without IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	0	0	1	1	4	10			
US shoulder	May be appropriate (Disagreement)		○ 0 mSv	○ 0 mSv [ped]	5	5	2	0	1	5	4	3	1	0	0			

X-ray arthrography shoulder	May be appropriate		⊕ <0.1 mSv		4	4	7	0	1	4	2	1	1	0	0
MR arthrography shoulder	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	2	2	7	2	3	1	3	0	0	0	0
CT arthrography shoulder	Usually not appropriate		⊕⊕⊕⊕ 10-30 mSv		1	1	12	0	1	2	0	0	1	0	0
CT shoulder with IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0
CT shoulder without IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0
CT shoulder without and with IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0
MRI shoulder without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	13	1	1	0	1	0	0	0	0

Variant 6: Atraumatic shoulder pain. Suspect biceps tendinitis, bursitis, dislocation or tear. Initial 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 shoulder without IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	8	8	1	0	0	0	2	0	5	1	7
US shoulder	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	8	8	0	1	0	0	0	0	5	3	7
MR arthrography shoulder	May be appropriate (Disagreement)		○ 0 mSv	○ 0 mSv [ped]	5	7	1	0	1	0	3	3	4	3	1
CT arthrography shoulder	Usually not appropriate		⊕⊕⊕⊕ 10-30 mSv		1	1	12	0	1	2	1	0	0	0	0
CT shoulder with IV contrast	Usually not appropriate		⊕⊕⊕ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0

CT shoulder without IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	12	0	2	1	0	0	1	0	0
CT shoulder without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	16	0	0	0	0	0	0	0	0
X-ray arthrography shoulder	Usually not appropriate		☼ <0.1 mSv		1	1	13	2	1	0	0	0	0	0	0
MRI shoulder without and with IV contrast	Usually not appropriate		○ 0 mSv	○ 0 mSv [ped]	1	1	13	1	2	0	0	0	0	0	0

Variant 7: Pain after rotator cuff repair. Initial 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
MR arthrography shoulder	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	9	9	0	0	0	1	1	1	1	4	8
MRI shoulder without IV contrast	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	8	8	0	0	0	0	0	1	2	6	7
US shoulder	Usually appropriate		○ 0 mSv	○ 0 mSv [ped]	8	8	0	0	0	0	0	0	2	12	2
CT arthrography shoulder	May be appropriate		☼☼☼☼ 10-30 mSv		6	6	0	0	0	0	8	7	1	0	0
CT shoulder with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0
CT shoulder without IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	13	1	2	0	0	0	0	0	0
CT shoulder without and with IV contrast	Usually not appropriate		☼☼☼ 1-10 mSv		1	1	15	1	0	0	0	0	0	0	0
X-ray arthrography shoulder	Usually not appropriate		☼ <0.1 mSv		1	1	13	0	2	1	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.