## American College of Radiology

### ACR Appropriateness Criteria®

### Imaging After Shoulder Arthroplasty

**Variant 1:** Follow-up of the asymptomatic patient with a primary shoulder arthroplasty.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiography shoulder</td>
<td>Usually appropriate</td>
<td>☢</td>
<td>9</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>CT shoulder without IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>1</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>CT shoulder without and with IV</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>1</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0 0 0 0 0 0 0 0 0</td>
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<tr>
<td>CT shoulder with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
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<td>n/a</td>
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<td>0</td>
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<tr>
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<td>Usually not appropriate</td>
<td>☢</td>
<td>1</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>MRI shoulder without and with IV</td>
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<td>☢</td>
<td>1</td>
<td>n/a</td>
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<td>☢</td>
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<td>n/a</td>
<td>0</td>
<td>0</td>
<td>0 0 0 0 0 0 0 0 0</td>
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<td>☢</td>
<td>1</td>
<td>n/a</td>
<td>0</td>
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**Variant 2:** Symptomatic patient with a primary shoulder arthroplasty; unknown diagnosis. Initial study.
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<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
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<tbody>
<tr>
<td>Radiography shoulder</td>
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<td>☢ &lt;0.1 mSv</td>
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<td>CT shoulder without IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
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<tr>
<td>CT shoulder without and with IV contrast</td>
<td>Usually not appropriate</td>
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<td>n/a</td>
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<tr>
<td>CT shoulder with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
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<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
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<td>MRI shoulder without IV contrast</td>
<td>Usually not appropriate</td>
<td>☢ 0 mSv</td>
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<tr>
<td>MRI shoulder without and with IV contrast</td>
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<td>☢ 0 mSv</td>
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<td>n/a</td>
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<td></td>
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<tr>
<td>Tc-99m bone scan shoulder</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>5</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
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<td></td>
</tr>
<tr>
<td>US shoulder</td>
<td>Usually not appropriate</td>
<td>☢ 0 mSv</td>
<td>5</td>
<td>n/a</td>
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**Variant 3:** Evaluating patients with a painful primary shoulder arthroplasty: suspect aseptic loosening. Additional imaging following radiographs.
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<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT arthrography shoulder</td>
<td>May be appropriate</td>
<td>☢☢☢☢ 10-30 mSv</td>
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<td>n/a</td>
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<td>0</td>
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<tr>
<td>CT shoulder without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>1</td>
<td>n/a</td>
<td>0</td>
<td>0</td>
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<tr>
<td>CT shoulder with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
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<td>n/a</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>MRI shoulder without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv</td>
<td>1</td>
<td>n/a</td>
<td>0</td>
<td>0 0 0 0 0 0 0 0 0</td>
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<tr>
<td>US shoulder</td>
<td>Usually not appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv</td>
<td>1</td>
<td>n/a</td>
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Variants:

**Variant 4:** Evaluating patients with a painful primary shoulder arthroplasty: suspect infection. Additional imaging following radiographs.

<table>
<thead>
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<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
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<th>Final Tabulations</th>
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<tbody>
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<tr>
<td>In-111 WBC and Tc-99m sulfur colloid scan shoulder</td>
<td>Usually appropriate</td>
<td>☢☢☢☢ 10-30 mSv</td>
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<td>MRI shoulder without IV contrast</td>
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<td>O 0 mSv</td>
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<td>MRI shoulder without and with IV contrast</td>
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<td>O 0 mSv</td>
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<td>n/a</td>
<td>0</td>
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<tr>
<td>US shoulder</td>
<td>May be appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv</td>
<td>5</td>
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<td>☢☢☢ 1-10 mSv</td>
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<td>Procedure</td>
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<td>SOE</td>
<td>Adults RRL</td>
<td>Peds RRL</td>
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<td>Median</td>
<td>Final Tabulations</td>
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<td>MRI shoulder without IV contrast</td>
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<td>Tc-99m bone scan shoulder</td>
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<tr>
<td>CT shoulder without and with IV contrast</td>
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<tr>
<td>CT shoulder with IV contrast</td>
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<tr>
<td>MRI shoulder without and with IV contrast</td>
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<td>US shoulder</td>
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**Variant 5:** Evaluating patients with a painful primary total shoulder arthroplasty: suspect fracture. Additional imaging following radiographs.

<table>
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<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
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<tbody>
<tr>
<td>CT shoulder without IV contrast</td>
<td>Usually appropriate</td>
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<td>MRI shoulder without IV contrast</td>
<td>May be appropriate</td>
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<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
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<td>n/a</td>
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<tr>
<td>Tc-99m bone scan shoulder</td>
<td>May be appropriate</td>
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<td>n/a</td>
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<td>CT shoulder without and with IV contrast</td>
<td>Usually not appropriate</td>
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<td>CT shoulder with IV contrast</td>
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<td>MRI shoulder without and with IV contrast</td>
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<td>US shoulder</td>
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**Variant 6:** Evaluating primary shoulder arthroplasty patients with possible rotator cuff tear. Additional imaging following radiographs.
<table>
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<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
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<tbody>
<tr>
<td>CT arthrography shoulder</td>
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<td>0 0 mSv</td>
<td>0 0 mSv [ped]</td>
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<tr>
<td>CT shoulder without and with IV contrast</td>
<td>Usually not appropriate</td>
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<tr>
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<td>MRI shoulder without and with IV contrast</td>
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<td>Tc-99m bone scan shoulder</td>
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</table>

Variant 7: Evaluating primary shoulder arthroplasty patients with possible nerve injury. Additional imaging following radiographs.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness Category</th>
<th>SOE</th>
<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
<th>Final Tabulations</th>
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<tbody>
<tr>
<td>US shoulder</td>
<td>Usually appropriate</td>
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<td>0 0 mSv</td>
<td>0 0 mSv [ped]</td>
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<td>MRI shoulder without IV contrast</td>
<td>Usually appropriate</td>
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<td>0 0 mSv</td>
<td>0 0 mSv [ped]</td>
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<td>Appropriateness</td>
<td>Radiation Dose</td>
<td>Dose (ped)</td>
<td>Age</td>
<td>Gender</td>
<td>X-rays</td>
<td>Ultrasounds</td>
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</tr>
<tr>
<td>MRI shoulder without and with IV contrast</td>
<td>May be appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
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<td>n/a</td>
<td>0</td>
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<td>CT shoulder without IV contrast</td>
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</tr>
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<td>Tc-99m bone scan shoulder</td>
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</tr>
<tr>
<td>CT shoulder without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>1</td>
<td>n/a</td>
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<tr>
<td>CT shoulder with IV contrast</td>
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</table>
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.