### Osteonecrosis of the Hip

**Variant 1:** Adult or Child. Clinically suspected osteonecrosis. First study.

<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 pelvis and hips</td>
<td>Usually appropriate</td>
<td>SOE</td>
<td>1-10 mSv</td>
<td>3-10 mSv [ped]</td>
<td>9</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>CT hips with IV contrast</td>
<td>Usually not appropriate</td>
<td>SOE</td>
<td>1-10 mSv</td>
<td>3-10 mSv [ped]</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>CT hips without IV contrast</td>
<td>Usually not appropriate</td>
<td>SOE</td>
<td>1-10 mSv</td>
<td>3-10 mSv [ped]</td>
<td>1</td>
<td>n/a</td>
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<tr>
<td>CT hips without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>SOE</td>
<td>10-30 mSv</td>
<td>10-30 mSv [ped]</td>
<td>1</td>
<td>n/a</td>
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<tr>
<td>MRI hips without IV contrast</td>
<td>Usually not appropriate</td>
<td>O</td>
<td>0 mSv</td>
<td>0 mSv [ped]</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>MRI hips without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>O</td>
<td>0 mSv</td>
<td>0 mSv [ped]</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>Bone scan with SPECT or SPECT/CT hips</td>
<td>Usually not appropriate</td>
<td>O</td>
<td>1-10 mSv</td>
<td>3-10 mSv [ped]</td>
<td>1</td>
<td>n/a</td>
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</table>

**Variant 2:** Adult. Clinically suspected osteonecrosis. Normal radiographs or radiographs that show femoral head lucencies suspicious for osteonecrosis.
<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>
</tr>
</thead>
<tbody>
<tr>
<td>MRI hips without IV contrast</td>
<td>Usually appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>9</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
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<tr>
<td>MRI hips without and with IV contrast</td>
<td>May be appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>5</td>
<td>n/a</td>
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<tr>
<td>CT hips without IV contrast</td>
<td>May be appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
<td>5</td>
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<tr>
<td>CT hips without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 10-30 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
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<td>CT hips with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
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<tr>
<td>Bone scan with SPECT or SPECT/CT hips</td>
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<td>☢☢☢☢ 3-10 mSv [ped]</td>
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**Variant 3:** Child. Clinically suspected osteonecrosis. Normal radiographs or radiographs suspicious for osteonecrosis.

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<th>Appropriateness Category</th>
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<th>Adults RRL</th>
<th>Peds RRL</th>
<th>Rating</th>
<th>Median</th>
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<tr>
<td>Bone scan with SPECT or SPECT/CT hips</td>
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<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
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<td>n/a</td>
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<tr>
<td>MRI hips without IV contrast</td>
<td>Usually appropriate</td>
<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>MRI hips without and with IV contrast</td>
<td>Usually appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>8</td>
<td>n/a</td>
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<tr>
<td>CT hips without IV contrast</td>
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<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
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CT hips without and with IV contrast

<table>
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<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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<tr>
<td>Usually not appropriate</td>
<td></td>
<td></td>
<td>Hazard 10-30 mSv</td>
<td>Hazard 10-30 mSv</td>
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CT hips with IV contrast

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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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<tr>
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<td>Hazard 1-10 mSv</td>
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Variant 4: Adult. Osteonecrosis with femoral head collapse by radiographs in the painful hip(s). Surgery contemplated.

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<th>Appropriateness Category</th>
<th>SOE</th>
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<th>Rating</th>
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<th>Final Tabulations</th>
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<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
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<td>Hazard 1-10 mSv</td>
<td>Hazard 3-10 mSv</td>
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<td>Hazard 10-30 mSv</td>
<td>Hazard 10-30 mSv</td>
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<td>Hazard 3-10 mSv</td>
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Variant 5: Child. Osteonecrosis with femoral head collapse by radiographs in the painful hip(s). Surgery contemplated.

<table>
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<th>Procedure</th>
<th>Appropriateness Category</th>
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<td>Hazard 3-10 mSv</td>
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<td>O 0 mSv [ped]</td>
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<td>O 0 mSv</td>
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<td>Hazard 3-10 mSv</td>
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<td>Hazard 10-30 mSv</td>
<td>Hazard 10-30 mSv</td>
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<td>CT hips with IV contrast</td>
<td>Usually not appropriate</td>
<td></td>
<td>Hazard 1-10 mSv</td>
<td>Hazard 3-10 mSv</td>
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<tr>
<td>Bone scan with SPECT or SPECT/CT hips</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
<td>3</td>
<td>n/a</td>
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<tr>
<td>MRI hips without IV contrast</td>
<td>Usually appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
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<td>Usually appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>7</td>
<td>n/a</td>
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<td></td>
</tr>
<tr>
<td>CT hips without IV contrast</td>
<td>May be appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
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</tr>
<tr>
<td>CT hips without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 10-30 mSv</td>
<td>☢☢☢☢ 10-30 mSv [ped]</td>
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<td>n/a</td>
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<tr>
<td>CT hips with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
<td>1</td>
<td>n/a</td>
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</table>

**Variant 6:** Adult or child. Osteonecrosis clinically suspected. Radiographs normal or abnormal but MRI contraindicated. Further evaluation is needed.

<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>CT hips with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
<td>1</td>
<td>n/a</td>
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</tr>
<tr>
<td>CT hips without IV contrast</td>
<td>Usually appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
<td>9</td>
<td>n/a</td>
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<tr>
<td>CT hips without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 10-30 mSv</td>
<td>☢☢☢☢ 10-30 mSv [ped]</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>Bone scan with SPECT or SPECT/CT hips</td>
<td>Usually appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
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<td>8</td>
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</tr>
</tbody>
</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](http://www.acr.org/ac).