

American College of Radiology ACR Appropriateness Criteria®

Acute Hip Pain

Variant 1: Adult. Acute hip pain, traumatic. Initial imaging.

| Procedure | Appropriateness Category | SOE | Adults RRL | Peds RRL | Rating | Median | Final Tabulations | | | | | | | | |
|--------------------------------------|--------------------------|------------------|--------------|---------------|--------|--------|-------------------|---|---|---|---|---|---|---|----|
| | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Radiography hip | Usually appropriate | Strong | ⊕⊕⊕ 1-10 mSv | | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 2 (29959502) | | 4 | | | | | | | | | | | |
| | | 17 (33131797) | | 4 | | | | | | | | | | | |
| | | 16 (29894220) | | 2 | | | | | | | | | | | |
| | | 15 (23365546) | | 2 | | | | | | | | | | | |
| | | 14 (23787985) | | 4 | | | | | | | | | | | |
| CT hip without IV contrast | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | | 1 | 1 | 14 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 |
| MRI hip without IV contrast | Usually not appropriate | Expert Consensus | ○ 0 mSv | ○ 0 mSv [ped] | 1 | 1 | 15 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| MRI hip without and with IV contrast | Usually not appropriate | Expert Consensus | ○ 0 mSv | ○ 0 mSv [ped] | 1 | 1 | 15 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| Bone scan hip | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | | 1 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| US hip | Usually not appropriate | Expert Consensus | ○ 0 mSv | ○ 0 mSv [ped] | 1 | 1 | 14 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| CT hip with IV contrast | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | | 1 | 1 | 15 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

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|-------------------------------------|-------------------------|------------------|--------------|--|---|---|----|---|---|---|---|---|---|---|---|
| CT hip without and with IV contrast | Usually not appropriate | Expert Consensus | ⊕⊕⊕ 1-10 mSv | | 1 | 1 | 15 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
|-------------------------------------|-------------------------|------------------|--------------|--|---|---|----|---|---|---|---|---|---|---|---|

Variant 2: Adult. Acute hip pain, traumatic. Suspect fracture. Radiographs negative or indeterminate. Next imaging study.

| Procedure | Appropriateness Category | SOE | Adults RRL | Peds RRL | Rating | Median | Final Tabulations | | | | | | | | |
|----------------------------|--------------------------|--------|--------------|----------|--------|--------|-------------------|---|---|---|---|---|---|---|---|
| | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| CT hip without IV contrast | Usually appropriate | Strong | ⊕⊕⊕ 1-10 mSv | | 9 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 9 |

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|--|---------------|--|---------------|--|
| | References | | Study Quality | |
| | 27 (28301779) | | 2 | |
| | 26 (31147733) | | 4 | |
| | 25 (34840828) | | 3 | |
| | 24 (32844321) | | 4 | |
| | 23 (30249714) | | 4 | |
| | 22 (31650264) | | 1 | |
| | 21 (31461322) | | Good | |
| | 20 (32633673) | | Good | |
| | 19 (33039184) | | 4 | |
| | 18 (31209592) | | Inadequate | |

| | | | | | | | | | | | | | | | |
|-----------------------------|---------------------|--------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|
| MRI hip without IV contrast | Usually appropriate | Strong | ○ 0 mSv | ○ 0 mSv [ped] | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 4 | 7 |
|-----------------------------|---------------------|--------|---------|---------------|---|---|---|---|---|---|---|---|---|---|---|

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|--|---------------|--|---------------|--|
| | References | | Study Quality | |
| | 31 (32755182) | | Not Assessed | |
| | 30 (33175269) | | 4 | |
| | 29 (22623574) | | 2 | |
| | 28 (31725122) | | 4 | |
| | 23 (30249714) | | 4 | |
| | 22 (31650264) | | 1 | |
| | 21 (31461322) | | Good | |

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|--------------------------------------|-------------------------|------------------|---------------|---------------|---------------|---|----|---|---|---|---|---|---|---|---|
| | | | 20 (32633673) | | Good | | | | | | | | | | |
| | | | 19 (33039184) | | 4 | | | | | | | | | | |
| | | | 18 (31209592) | | Inadequate | | | | | | | | | | |
| MRI hip without and with IV contrast | Usually not appropriate | Expert Consensus | O O mSv | O O mSv [ped] | 1 | 1 | 13 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| Bone scan hip | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 13 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| US hip | Usually not appropriate | Limited | O O mSv | O O mSv [ped] | 1 | 1 | 11 | 3 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| | | | References | | Study Quality | | | | | | | | | | |
| | | | 33 (36570856) | | 4 | | | | | | | | | | |
| | | | 32 (36521235) | | 1 | | | | | | | | | | |
| CT hip with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CT hip without and with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 12 | 2 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |

Variant 3: Adult. Acute hip pain, traumatic. Radiographs positive for hip fracture. Next imaging study.

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|--------------------------------------|-------------------------|------------------|--------------|---------------|---|---|----|---|---|---|----|---|---|---|---|
| MRI hip without IV contrast | May be appropriate | Limited | 0 0 mSv | 0 0 mSv [ped] | 5 | 5 | 0 | 0 | 0 | 1 | 10 | 1 | 3 | 1 | 0 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 41 (32792156) | | 4 | | | | | | | | | | | |
| | | 40 (34904188) | | 4 | | | | | | | | | | | |
| | | 39 (30899712) | | 3 | | | | | | | | | | | |
| | | 20 (32633673) | | Good | | | | | | | | | | | |
| MRI hip without and with IV contrast | Usually not appropriate | Expert Consensus | 0 0 mSv | 0 0 mSv [ped] | 1 | 1 | 14 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bone scan hip | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| US hip | Usually not appropriate | Expert Consensus | 0 0 mSv | 0 0 mSv [ped] | 1 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CT hip with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| CT hip without and with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 13 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

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|--------------------------------------|-------------------------|------------------|--------------|---------------|---|---|----|---|---|---|---|---|---|---|---|
| MRI hip without and with IV contrast | Usually not appropriate | Expert Consensus | 0.0 mSv | 0.0 mSv [ped] | 1 | 1 | 14 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bone scan hip | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| US hip | Usually not appropriate | Expert Consensus | 0.0 mSv | 0.0 mSv [ped] | 1 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CT hip with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| CT hip without and with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 13 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |

Variant 4: Adult. Acute hip pain, traumatic. Post reduction of hip dislocation. Follow-up imaging.

| Procedure | Appropriateness Category | SOE | Adults RRL | Peds RRL | Rating | Median | Final Tabulations | | | | | | | | |
|----------------------------|--------------------------|---------------|--------------|---------------|--------|--------|-------------------|---|---|---|---|---|---|---|----|
| | | | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Radiography hip | Usually appropriate | Limited | ☹☹☹ 1-10 mSv | | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 44 (34623933) | | 4 | | | | | | | | | | | |
| CT hip without IV contrast | Usually appropriate | Limited | ☹☹☹ 1-10 mSv | | 7 | 7 | 1 | 0 | 0 | 0 | 3 | 4 | 0 | 3 | 5 |
| | | References | | Study Quality | | | | | | | | | | | |
| | | 43 (16424806) | | 4 | | | | | | | | | | | |

[illegible]

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| | | 42 (29146169) | | 4 | | | | | | | | | | | |
| | | 8 (29131775) | | 4 | | | | | | | | | | | |
| MRI hip without IV contrast | Usually not appropriate | Expert Consensus | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 10 | 1 | 2 | 1 | 0 | 2 | 0 | 0 | 0 |
| MRI hip without and with IV contrast | Usually not appropriate | Expert Consensus | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 14 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bone scan hip | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| US hip | Usually not appropriate | Expert Consensus | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 15 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| CT hip with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 14 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| CT hip without and with IV contrast | Usually not appropriate | Expert Consensus | ☼☼☼ 1-10 mSv | | 1 | 1 | 14 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

Variant 5: Adult. Acute hip pain, traumatic. Suspect tendon, muscle, or ligament injury. Radiographs negative or indeterminate. 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 hip without IV contrast | Usually appropriate | Strong | O 0 mSv | O 0 mSv [ped] | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 12 |

| References | Study Quality |
|---------------|---------------|
| 58 (32718743) | 4 |
| 57 (31163508) | 4 |
| 56 (29757716) | 4 |
| 55 (35494306) | 3 |
| 54 (12942206) | 4 |
| 53 (31283532) | 4 |
| 52 (37092718) | 4 |
| 51 (22038311) | M |

| | |
|---------------|---|
| 50 (32513090) | 4 |
| 49 (25453914) | 2 |
| 48 (27011854) | 4 |
| 47 (18450496) | 1 |
| 46 (14684527) | 3 |
| 45 (10430134) | 4 |

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|--------------------------------------|-------------------------|------------------|--------------|---------------|---|---|----|---|---|---|---|---|---|---|---|
| CT hip without IV contrast | Usually not appropriate | Expert Consensus | ☹☹☹ 1-10 mSv | | 1 | 1 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MRI hip without and with IV contrast | Usually not appropriate | Expert Consensus | ○ 0 mSv | ○ 0 mSv [ped] | 1 | 1 | 13 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 |
| Bone scan hip | Usually not appropriate | Expert Consensus | ☹☹☹ 1-10 mSv | | 1 | 1 | 14 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| US hip | Usually not appropriate | Limited | ○ 0 mSv | ○ 0 mSv [ped] | 1 | 1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

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| References | Study Quality |
| 59 (19941093) | 4 |
| 56 (29757716) | 4 |
| 54 (12942206) | 4 |

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|-------------------------------------|-------------------------|------------------|--------------|--|---|---|----|---|---|---|---|---|---|---|---|
| CT hip with IV contrast | Usually not appropriate | Expert Consensus | ☹☹☹ 1-10 mSv | | 1 | 1 | 13 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 |
| CT hip without and with IV contrast | Usually not appropriate | Expert Consensus | ☹☹☹ 1-10 mSv | | 1 | 1 | 13 | 0 | 2 | 0 | 0 | 0 | 1 | 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.