## Sensitivity to Radiation for Imaging Procedures

### Variant 1: Suspected physical abuse. Child 24 months of age. Neurological or visceral injuries not clinically suspected. Initial imaging evaluation.

<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 skeletal survey</td>
<td>Usually appropriate</td>
<td></td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>9</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>MRI head without IV contrast</td>
<td>May be appropriate</td>
<td></td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>6</td>
<td>n/a</td>
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<tr>
<td>CT head without IV contrast</td>
<td>May be appropriate</td>
<td></td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>5</td>
<td>n/a</td>
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</tr>
<tr>
<td>Tc-99m bone scan whole body</td>
<td>May be appropriate</td>
<td></td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 3-10 mSv [ped]</td>
<td>4</td>
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</tr>
<tr>
<td>MRI head without and with IV contrast</td>
<td>Usually not appropriate</td>
<td></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>CT head without and with IV contrast</td>
<td>Usually not appropriate</td>
<td></td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 3-10 mSv [ped]</td>
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</tr>
<tr>
<td>CT head with IV contrast</td>
<td>Usually not appropriate</td>
<td></td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>1</td>
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</table>

### Variant 2: Suspected physical abuse. Child >24 months of age. Neurological or visceral injuries not clinically suspected. Initial imaging evaluation.
<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 area of interest</td>
<td>Usually appropriate</td>
<td>Varies</td>
<td>Varies</td>
<td></td>
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</tr>
<tr>
<td>CT head without IV contrast</td>
<td>May be appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>6</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>Radiography skeletal survey</td>
<td>May be appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>5</td>
<td>n/a</td>
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<td></td>
</tr>
<tr>
<td>MRI head without IV contrast</td>
<td>May be appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv</td>
<td></td>
<td>5</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>Tc-99m bone scan whole body</td>
<td>May be appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>4</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>MRI head without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>O 0 mSv</td>
<td>O 0 mSv</td>
<td></td>
<td>2</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
<tr>
<td>CT head without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>CT head with IV contrast</td>
<td>Usually not appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>1</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
</tbody>
</table>

Variant 3: Child with one or more of the following: neurologic signs or symptoms, apnea, complex skull fracture, other fractures, or injuries highly suspicious for child abuse. Initial imaging evaluation.

<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 skeletal survey</td>
<td>Usually appropriate</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢ 0.3-3 mSv [ped]</td>
<td>9</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
</tbody>
</table>
### CT head without IV contrast
- **Usually appropriate**
- [SOE] Usually appropriate
- [Adults RRL] Very High
- [Peds RRL] Very High
- [Rating] 9
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

### MRI head without IV contrast
- **Usually appropriate**
- [Peds RRL] Very High
- [Adults RRL] Very High
- [Rating] 9
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

### MRI cervical spine without IV contrast
- **Usually appropriate**
- [Peds RRL] Very High
- [Adults RRL] Very High
- [Rating] 9
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

### Tc-99m bone scan whole body
- [SOE] Usually appropriate
- [Peds RRL] Very High
- [Rating] 9
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

### MRI complete spine without IV contrast
- **May be appropriate**
- [Peds RRL] Very High
- [Rating] 5
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

### MRI head without and with IV contrast
- **Usually not appropriate**
- [Peds RRL] Very High
- [Rating] 1
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

### MRI complete spine without and with IV contrast
- **Usually not appropriate**
- [Peds RRL] Very High
- [Rating] 2
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

### MRI cervical spine without and with IV contrast
- **Usually not appropriate**
- [Peds RRL] Very High
- [Rating] 2
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

### CT head without and with IV contrast
- **Usually not appropriate**
- [Peds RRL] Very High
- [Rating] 1
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

### CT head with IV contrast
- **Usually not appropriate**
- [Peds RRL] Very High
- [Rating] 1
- [Median] n/a
- [Final Tabulations] 0 0 0 0 0 0 0 0 0

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**Variant 4:**  Child. Suspected physical abuse. Suspected thoracic or abdominopelvic injuries (eg, abdominal skin bruises, distension, tenderness, or elevated liver or pancreatic enzymes). Initial imaging evaluation.

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Appropriateness</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 skeletal survey</td>
<td>Usually appropriate</td>
<td>[SOE] Usually appropriate</td>
<td>Very High</td>
<td>Very High</td>
<td>9</td>
<td>n/a</td>
<td>0 0 0 0 0 0 0 0 0</td>
</tr>
</tbody>
</table>
CT abdomen and pelvis with IV contrast | Usually appropriate | ☢☢☢ 1-10 mSv | ☢☢☢ 3-10 mSv [ped] | 9 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
---|---|---|---|---|---|---|---|---|---|---|---|---|---
MRI head without IV contrast | May be appropriate | O 0 mSv | O 0 mSv [ped] | 6 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
CT head without IV contrast | May be appropriate | ☢☢☢ 1-10 mSv | ☢☢☢ 0.3-3 mSv [ped] | 6 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
CT chest with IV contrast | May be appropriate | ☢☢☢ 1-10 mSv | ☢☢☢ 3-10 mSv [ped] | 6 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
Tc-99m bone scan whole body | May be appropriate | ☢☢☢ 1-10 mSv | ☢☢☢ 3-10 mSv [ped] | 4 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
CT chest without IV contrast | Usually not appropriate | ☢☢☢ 1-10 mSv | ☢☢☢ 3-10 mSv [ped] | 3 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
MRI head without and with IV contrast | Usually not appropriate | O 0 mSv | O 0 mSv [ped] | 2 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
CT abdomen and pelvis without IV contrast | Usually not appropriate | ☢☢☢ 1-10 mSv | ☢☢☢ 3-10 mSv [ped] | 2 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
CT head without and with IV contrast | Usually not appropriate | ☢☢☢ 1-10 mSv | ☢☢☢ 3-10 mSv [ped] | 1 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
CT head with IV contrast | Usually not appropriate | ☢☢☢ 1-10 mSv | ☢☢☢ 0.3-3 mSv [ped] | 1 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
CT abdomen and pelvis without and with IV contrast | Usually not appropriate | ☢☢☢ 10-30 mSv | ☢☢☢ 10-30 mSv [ped] | 1 | n/a | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0

**Variant 5:** Child 24 months of age. High suspicion for abuse. Negative initial skeletal survey. Follow-up imaging evaluation.
<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>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tr>
<td>Radiography skeletal survey</td>
<td>Usually appropriate</td>
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<td>✿ ✿ ✿ 0.3-3 mSv</td>
<td>✿ ✿ ✿ ✿ 0.3-3 mSv [ped]</td>
<td>9</td>
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<tr>
<td>Tc-99m bone scan whole body</td>
<td>May be appropriate</td>
<td></td>
<td>✿ ✿ ✿ 1-10 mSv</td>
<td>✿ ✿ ✿ ✿ ✿ 3-10 mSv [ped]</td>
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<tr>
<td>MRI head without IV contrast</td>
<td>May be appropriate</td>
<td></td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
<td>5</td>
<td>n/a</td>
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</tr>
<tr>
<td>CT chest without IV contrast</td>
<td>May be appropriate</td>
<td></td>
<td>✿ ✿ ✿ ✿ ✿ 1-10 mSv</td>
<td>✿ ✿ ✿ ✿ ✿ 3-10 mSv [ped]</td>
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<tr>
<td>CT head without IV contrast</td>
<td>May be appropriate</td>
<td></td>
<td>✿ ✿ ✿ ✿ ✿ 1-10 mSv</td>
<td>✿ ✿ ✿ ✿ ✿ 0.3-3 mSv [ped]</td>
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</tr>
<tr>
<td>MRI head without and with IV contrast</td>
<td>Usually not appropriate</td>
<td></td>
<td>O 0 mSv</td>
<td>O 0 mSv [ped]</td>
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<td>CT head without and with IV contrast</td>
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<td></td>
<td>✿ ✿ ✿ ✿ ✿ 1-10 mSv</td>
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<tr>
<td>CT head with IV contrast</td>
<td>Usually not appropriate</td>
<td></td>
<td>✿ ✿ ✿ ✿ ✿ 1-10 mSv</td>
<td>✿ ✿ ✿ ✿ ✿ 0.3-3 mSv [ped]</td>
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<td>0</td>
</tr>
<tr>
<td>CT chest without and with IV contrast</td>
<td>Usually not appropriate</td>
<td></td>
<td>✿ ✿ ✿ ✿ ✿ 1-10 mSv</td>
<td>✿ ✿ ✿ ✿ ✿ 3-10 mSv [ped]</td>
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<td>0</td>
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</tr>
<tr>
<td>CT chest with IV contrast</td>
<td>Usually not appropriate</td>
<td></td>
<td>✿ ✿ ✿ ✿ ✿ 1-10 mSv</td>
<td>✿ ✿ ✿ ✿ ✿ 3-10 mSv [ped]</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).