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

#### Suspected Spine Trauma

**Variant 1:** Age greater than or equal to 16 years and less than 65 years. Suspected acute blunt cervical spine trauma; imaging not indicated by NEXUS or CCR clinical criteria. Patient meets low-risk criteria. Initial imaging.

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**References**

- 49 (26239776)
- 48 (18469647)
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- 46 (21619408)
- 45 (18404054)
- 44 (25997715)
- 43 (24033302)
- 42 (18188119)
- 41 (20336892)
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- 39 (18073599)
- 38 (24731570)
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### References and Study Quality

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| CT myelography cervical spine | Usually not appropriate | Expert Consensus | ☢☢☢☢ 10-30 mSv | ☢☢☢ 0.3-3 mSv [ped] | 1 | 1 | 15 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
|-----------------------------|-------------------------|-----------------|-----------------|---------------------|---|---|----|---|---|---|---|---|---|---|---|---|---|

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| CT cervical spine without and with IV contrast | Usually not appropriate | Strong | ☢☢☢ 1-10 mSv | ☢☢☢☢ 3-10 mSv [ped] | 1 | 1 | 15 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

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| MRI cervical spine without and with IV contrast | Usually not appropriate | Strong | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 15 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

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Variant 2:  Age greater than or equal to 16 years. Suspected acute cervical spine blunt trauma. Imaging indicated by NEXUS or CCR clinical criteria. Initial imaging.

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**Study Quality**

| 3 |
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**Arteriography cervicocerebral**

| Usually not appropriate | Expert Consensus | ☢☢☢ 1-10 mSv | ☢☢☢☢ 3-10 mSv [ped] | 1 | 1 | 15 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
|-------------------------|-----------------|-----------------|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|

**MRA neck without IV contrast**

| Usually not appropriate | Expert Consensus | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 16 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**MRA neck without and with IV contrast**

| Usually not appropriate | Expert Consensus | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 15 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

**MRI cervical spine without IV contrast**

| Usually not appropriate | Strong | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 9 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

**References**

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| MRI cervical spine without and with IV contrast | Usually not appropriate | Strong | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
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| 38 (24731570) | 3 |
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Variant 3: Age greater than or equal to 16 years. Suspected acute cervical spine blunt trauma. Confirmed or suspected cervical spinal cord or nerve root injury, with or without traumatic injury identified on cervical CT. Next imaging study.

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**Variant 5:** Age greater than or equal to 16 years. Suspected acute cervical spine blunt trauma. Clinical or imaging findings suggest arterial injury with or without positive cervical spine CT. Next imaging study.
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Variant 6: Age greater than or equal to 16 years. Suspected acute cervical spine blunt trauma. Obtunded patient with no traumatic injury identified on cervical spine CT. Next imaging study after CT cervical spine without IV contrast.

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**Usually not appropriate**

| Strong | O 0 mSv | O 0 mSv [ped] | 1 | 1 | 14 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 |

### Radiography cervical spine

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**Usually not appropriate**

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Variant 7: Age greater than or equal to 16 years. Suspected acute cervical spine blunt trauma. Clinical or imaging findings suggest ligamentous injury. Next imaging study after CT cervical spine without IV contrast.

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Variant 8:  Age greater than or equal to 16 years. Suspected acute cervical spine blunt trauma. Follow-up imaging on patient with no unstable injury demonstrated initially, but kept in collar for neck pain. No new neurologic symptoms. Includes whiplash associated disorders.

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<tr>
<td>CT cervical spine with IV contrast</td>
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</tr>
<tr>
<td>CT cervical spine without and with IV contrast</td>
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</tr>
<tr>
<td>Arteriography cervicocerebral</td>
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<tr>
<td>MRA neck without IV contrast</td>
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### Variant 9: Age greater than or equal to 16 years. Blunt trauma meeting criteria for thoracic and lumbar imaging. Initial imaging.

<table>
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<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>
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<td>Strong</td>
<td>☢☢☢ 1-10 mSv</td>
<td>☢☢☢☢ 3-10 mSv [ped]</td>
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<td>9</td>
<td>0 0 0 0 1 0 1 0 15</td>
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<table>
<thead>
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<th>References</th>
<th>Study Quality</th>
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<td>May be appropriate</td>
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<td>References</td>
<td>Study Quality</td>
</tr>
<tr>
<td>109 (20699755)</td>
<td>3</td>
</tr>
<tr>
<td>108 (14566120)</td>
<td>2</td>
</tr>
<tr>
<td>107 (-3131250)</td>
<td>3</td>
</tr>
<tr>
<td>104 (23422283)</td>
<td>2</td>
</tr>
</tbody>
</table>

| CT myelography thoracic and lumbar spine | Usually not appropriate | Expert Consensus | ☢☢☢ 10-30 mSv | ☢☢☢ 3-10 mSv [ped] | 1 | 1 | 15 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
|-------------------------------------------|--------------------------|------------------|-----------------|-------------------|---|---|----|---|---|---|----|---|---|---|---|---|
| References                                | Study Quality            |                  |                |                   |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 110 (27663571)                            | 2                         |                  |                |                   |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 109 (20699755)                            | 3                         |                  |                |                   |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 108 (14566120)                            | 2                         |                  |                |                   |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 107 (-3131250)                            | 3                         |                  |                |                   |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 104 (23422283)                            | 2                         |                  |                |                   |   |   |    |   |   |   |    |   |   |   |   |   |   |

| CT thoracic and lumbar spine with IV contrast | Usually not appropriate | Strong | ☢☢☢ 1-10 mSv | ☢☢☢ 0.3-10 mSv [ped] | 1 | 1 | 14 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 |
|------------------------------------------------|--------------------------|--------|----------------|------------------------|---|---|----|---|---|---|----|---|---|---|---|---|---|
| References                                    | Study Quality            |        |                |                        |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 110 (27663571)                                | 2                         |        |                |                        |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 109 (20699755)                                | 3                         |        |                |                        |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 108 (14566120)                                | 2                         |        |                |                        |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 107 (-3131250)                                | 3                         |        |                |                        |   |   |    |   |   |   |    |   |   |   |   |   |   |
| 104 (23422283)                                | 2                         |        |                |                        |   |   |    |   |   |   |    |   |   |   |   |   |   |
MRI thoracic and lumbar spine without IV contrast

Usually not appropriate
Expert Consensus
0 mSv
0 mSv [ped]
1 1 9 0 2 3 2 0 0 0 0

MRI thoracic and lumbar spine without and with IV contrast

Usually not appropriate
Expert Consensus
0 mSv
0 mSv [ped]
1 1 15 0 2 0 0 0 0 0 0

Variant 10: Age greater than or equal to 16 years. Acute thoracic or lumbar spine injury detected on radiographs or noncontrast CT. Neurologic abnormalities. Next imaging 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>
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<td>0 mSv [ped]</td>
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<td>9</td>
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References
111 (14769351) 4
43 (24033302) 3
41 (20336892) 4

CT myelography thoracic and lumbar spine

May be appropriate
Limited
☢☢☢ 10-30 mSv
☢☢☢☢ 3-10 mSv [ped]
5 5 0 0 1 5 8 1 1 0 0

References
57 (15734929) 4
43 (24033302) 3
41 (20336892) 4
40 (16374279) 2

CT thoracic and lumbar spine with IV contrast

 Usually not appropriate
Limited
☢☢☢ 1-10 mSv
☢☢☢☢ 3-10 mSv [ped]
1 1 15 1 0 0 0 0 0 0 0

References
57 (15734929) 4
43 (24033302) 3
41 (20336892) 4
40 (16374279) 2
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<th>References</th>
<th>Study Quality</th>
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<tr>
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<td></td>
<td>10-30 mSv</td>
<td>43 (24033302)</td>
<td>3</td>
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<tr>
<td></td>
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<td>3-10 mSv [ped]</td>
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<td>40 (16374279)</td>
<td>2</td>
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<tr>
<td>MRI thoracic and lumbar spine without and with IV contrast</td>
<td>Usually not appropriate</td>
<td>0 mSv</td>
<td>111 (14769351)</td>
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</tr>
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<td>0 mSv [ped]</td>
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<td></td>
<td></td>
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<td>41 (20336892)</td>
<td>4</td>
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</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).