

# INJURY / DISEASE RELATED EVENTS

## Injuries and Injury severity

ExtraCranInj = Extracranial Injuries

InjSev = Injury Severity

1. CDE Variable	ExtraCranInj = Extracranial Injuries InjSev = Injury Severity
2. CDE Definition	Presence or absence of extracranial injuries. Abbreviated injury score calculated after all injuries have been identified and scored.
3. Recommended instrument for assessment	Physical examination; imaging studies (if obtained)
4. Description of measure	<p>The AIS is primarily a descriptive measure, capturing the severity of injuries on a 6 point ordinal severity scale per body region. The number of body regions defined varies between different versions of the AIS. In the original version, the AIS defines 9 body regions. In order to obtain consistency with the Injury Severity Score (ISS), we recommend to use the collapsed 6-region version of the AIS with additional annotations for spine since this is highly relevant to TBI. The body regions defined are:</p> <ul style="list-style-type: none"> <li>• Externa (skin)</li> <li>• Head (incl. brain) and Neck             <ul style="list-style-type: none"> <li>- brain injury</li> <li>- cervical spine</li> </ul> </li> <li>• Face</li> <li>• Thorax/Chest             <ul style="list-style-type: none"> <li>- thoracic spine</li> </ul> </li> <li>• Abdomen and pelvic contents             <ul style="list-style-type: none"> <li>- lumbar spine</li> </ul> </li> <li>• Extremities and pelvic girdle</li> </ul> <p><b><u>Definitions of body regions:</u></b></p> <ul style="list-style-type: none"> <li>- <i>Head or neck injuries</i> include injury to the brain or cervical spine, skull or cervical spine fractures.</li> <li>- <i>Facial injuries</i> include those involving mouth, ears, nose and facial bones.</li> <li>- <i>Chest injuries</i> include all lesions to internal organs. Chest injuries also include those to the diaphragm, rib cage, and thoracic spine.</li> <li>- <i>Abdominal or pelvic contents injuries</i> include all lesions to internal organs. Lumbar spine lesions are included in the abdominal or pelvic region.</li> <li>- <i>Injuries to the extremities or to the pelvic or shoulder girdle</i> include sprains, fractures, dislocations, and amputations, except for the spinal column, skull and</li> </ul>

	<p>rib cage.</p> <p>- <i>External injuries</i> include lacerations, contusions, abrasions, and burns, independent of their location on the body surface.</p> <p>-</p> <p><b><u>AIS severity coding:</u></b></p> <ol style="list-style-type: none"> <li>1. <i>Minor</i>: no treatment needed.</li> <li>2. <i>Moderate</i>: requires only outpatient treatment.</li> <li>3. <i>Serious</i>: requires non-ICU hospital admission.</li> <li>4. <i>Severe</i>: requires ICU observation and/or basic treatment.</li> <li>5. <i>Critical</i>: requires intubation, mechanical ventilation or vasopressors for blood pressure support.</li> <li>6. <i>Maximal</i>: not survivable.</li> </ol>		
<p><b>5. Permissible values</b></p>	<p><b><u>Extracranial Injuries</u></b></p> <ul style="list-style-type: none"> <li>• No</li> <li>• Yes</li> <li>• unknown</li> </ul> <table border="1" data-bbox="644 878 1418 1453"> <tr> <td data-bbox="644 878 1002 1453"> <p><b><u>AIS</u></b>  <u>Basic</u>  Highest AIS score:  1 = minor  2 = moderate  3 = serious  4 = severe  5 = critical  6 = unsurvivable</p> </td> <td data-bbox="1002 878 1418 1453"> <p><b><u>Body region with highest* AIS score:</u></b></p> <ul style="list-style-type: none"> <li>• Externa (skin)</li> <li>• Head (incl. brain) and Neck <ul style="list-style-type: none"> <li>- brain injury</li> <li>- cervical spine</li> </ul> </li> <li>• Face</li> <li>• Thorax/Chest <ul style="list-style-type: none"> <li>- thoracic spine</li> </ul> </li> <li>• Abdomen and pelvic contents <ul style="list-style-type: none"> <li>- lumbar spine</li> </ul> </li> <li>• Extremities and pelvic girdle</li> </ul> <p>* two or more categories may be marked if their severity ratings are equal</p> </td> </tr> </table>	<p><b><u>AIS</u></b>  <u>Basic</u>  Highest AIS score:  1 = minor  2 = moderate  3 = serious  4 = severe  5 = critical  6 = unsurvivable</p>	<p><b><u>Body region with highest* AIS score:</u></b></p> <ul style="list-style-type: none"> <li>• Externa (skin)</li> <li>• Head (incl. brain) and Neck <ul style="list-style-type: none"> <li>- brain injury</li> <li>- cervical spine</li> </ul> </li> <li>• Face</li> <li>• Thorax/Chest <ul style="list-style-type: none"> <li>- thoracic spine</li> </ul> </li> <li>• Abdomen and pelvic contents <ul style="list-style-type: none"> <li>- lumbar spine</li> </ul> </li> <li>• Extremities and pelvic girdle</li> </ul> <p>* two or more categories may be marked if their severity ratings are equal</p>
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	<p><u>Intermediate</u> Rank each body region using 1-6 scale</p> <ul style="list-style-type: none"> <li>• Externa (skin)</li> <li>• Head (incl. brain) and Neck <ul style="list-style-type: none"> <li>- brain injury</li> <li>- cervical spine</li> </ul> </li> <li>• Face</li> <li>• Thorax/Chest <ul style="list-style-type: none"> <li>- thoracic spine</li> </ul> </li> <li>• Abdomen/pelvic contents <ul style="list-style-type: none"> <li>- lumbar spine</li> </ul> </li> <li>• Extremities and pelvic girdle</li> </ul> <p><u>Advanced</u> Rank each body region using 1-6 scale and give description.</p> <ul style="list-style-type: none"> <li>• Externa (skin)</li> <li>• Head (incl.brain) and Neck <ul style="list-style-type: none"> <li>- brain injury</li> <li>- cervical spine</li> </ul> </li> <li>• Face</li> <li>• Thorax/Chest <ul style="list-style-type: none"> <li>- thoracic spine</li> </ul> </li> <li>• Abdomen/pelvic contents <ul style="list-style-type: none"> <li>- lumbar spine</li> </ul> </li> <li>• Extremities <ul style="list-style-type: none"> <li>- pelvic girdle</li> <li>- Upper extremities</li> <li>- Lower extremities</li> </ul> </li> </ul> <p>AIS: 1-6 ISS: max. 75</p>
<p><b>6. Classification:</b> <b>Basic/Intermediate/Advanced</b></p>	<p>See above</p>
<p><b>7. Procedure</b></p>	<p>Complete this information after a full trauma survey has been concluded.</p>
<p><b>8. Comments/Special instructions:</b> The AIS is an ordinal scale, but not an interval scale, e.g. the increase in injury severity for AIS 1 to 2 is much less than the increase from AIS 3 to 4 or from 4 to 5. For expressing the overall severity of injuries, the injury severity score (ISS) can be calculated from the AIS as follows: identify the three body regions with the highest AIS scores and summate the squares of these scores. If any body region AIS is assigned a 6, the AIS is automatically set to 75 (highest score). Spine is not considered separately in the original ISS classification, but included under the neck, chest and abdomen regions. For TBI, however, we consider it important to record spine additionally as sub-category, as injuries to the spine may occur together with TBI.</p>	
<p><b>9. Rationale/justification:</b> Extracranial injuries occur frequently in combination with TBI and may affect short-term and long-term outcome. Various studies have shown a higher mortality in patients with extracranial injuries in addition to the TBI. The AIS is a widely accepted approach for documenting injuries. In it's full form however, it is extensive, including much detail. For TBI studies a more abbreviated version as presented is better suited.</p>	

**10. References:**

*Baker SP, O'Neill B, Haddon W Jr, et al.* The injury severity score: a method for describing patients with multiple injuries and evaluating emergency care. *J Trauma*. Mar 1974;14(3):187-196

*Medicine AftAoA.* The Abbreviated Injury Scale, 1990 Revision. *Association for the Advancement of Automotive Medicine*. 15-24. 1990. Des Plaines, IL.

<http://www.sfar.org/scores2/triss2.html> - ISS calculator

**Recommended time for assessment:**

On admission following full trauma survey.