# SPINAL INJURY ASSESSMENT

**AND**

# IMMOBILIZATION GUIDELINE

## PREAMBLE

Determining and establishing consistent criteria for spinal injury indication, evaluation and the potential need for spinal immobilization – in situations of blunt &/or penetrating trauma – continues to be a complex element of pre-hospital care. This is seen in all environments and is perhaps most difficult for responders working in non-urban environments.

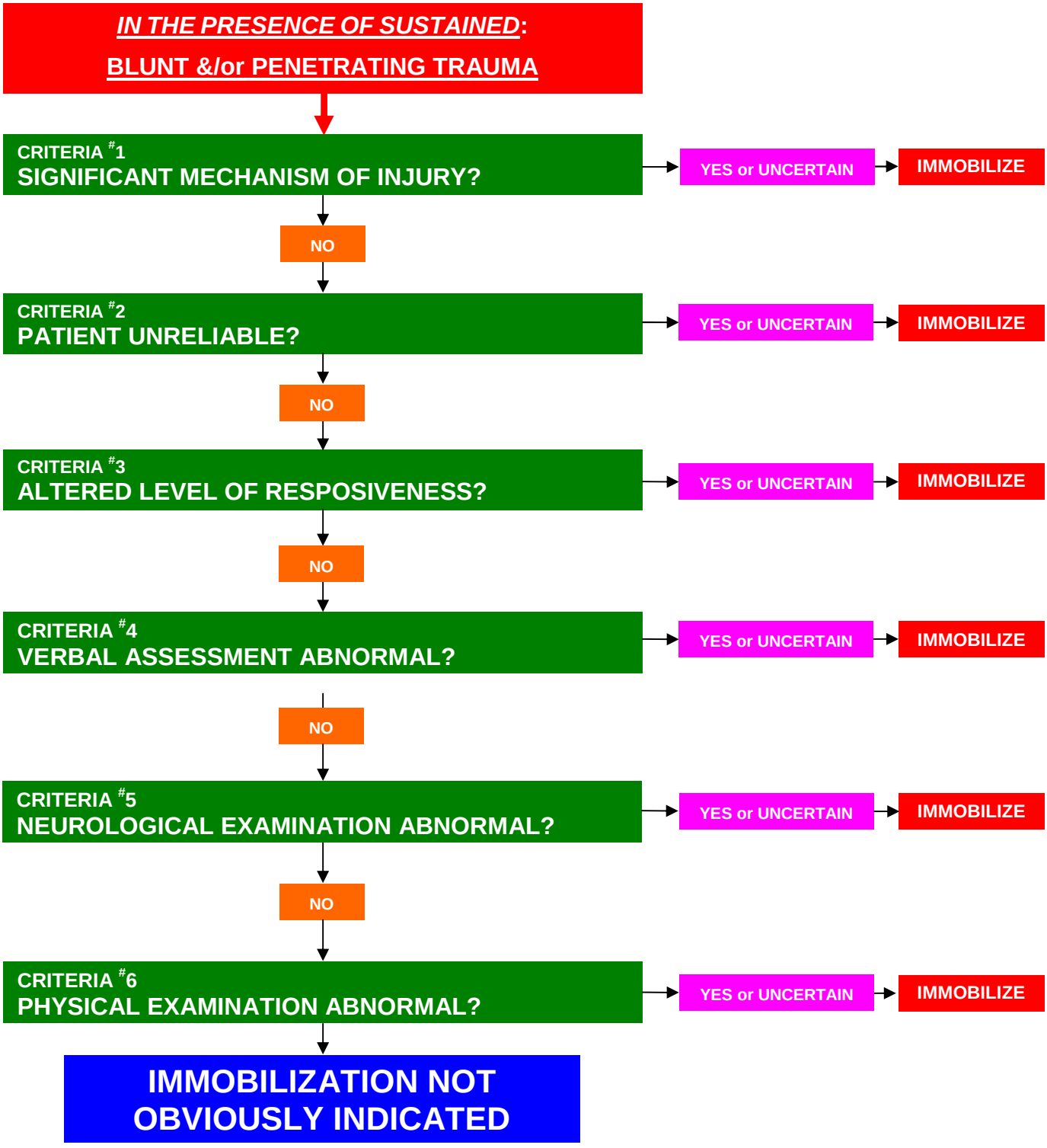
Implementation of a spinal assessment procedure in the non-urban environment requires careful consideration on the part of the responder. This document is intended to serve strictly as a guideline. It is to be noted that this guideline document cannot be considered a standard procedure or protocol for 'ruling-in' – or 'ruling-out' – the need for spinal immobilization.

Currently there exists no single one-standard method for the determination of spinal injury and the need for spinal immobilization in the pre-hospital setting. The standards that do exist rely on a subjective determination of the patient's Mechanism of Injury (MOI) combined with limited physical assessment criteria. These six (6) areas of determination and analysis are outlined in this document.

This guideline document was developed in conjunction with existing practice standards in the Occupational First Aid Level-3 (WorkSafe BC), Outdoor Emergency Care (National Ski Patrol), Canadian Ski Patrol System First Aid Course, PCP and ACP[1] certification courses.

[1]Occupational First Aid Course (WorkSafe BC), Outdoor Emergency Care 5th edition (Pearson Education), Canadian Ski Patrol System and Paramedic Care Certification Courses.

# SPINAL IMMOBILIZATION DETERMINATION ALGORITHM



# CRITERIA FOR SPINAL INJURY ASSESSMENT

## CRITERIA #1 – MECHANISM OF INJURY (MOI)

MOI is not an indicator of injury, rather it raises the responder's awareness of when to suspect, with a degree of probability, that spinal trauma may have occurred and also when to conduct spinal injury assessment. In all cases where a patient has sustained a significant MOI, one consistent with the possibility of having caused spinal trauma, regardless of presence of other findings or the lack thereof, spinal immobilization should be provided.

Significant MOI consistent with the possibility of having caused spinal trauma may include, (but not be limited to), the following:

- **1-a.** Moderate to severe deceleration.
- **1-b.** Moderate to high speed MVA – ejection, roll over, significant passenger compartment intrusion.
- **1-c.** Pedestrian stuck by vehicle greater than 30 km/hr; patients struck at 30 km/hr should be spinal immobilized regardless of findings conversely patients struck at speeds lower than 30 km/hr may require spinal immobilization and should be based on findings.
- **1-d.** Penetrating trauma to the head, neck, chest, abdomen, or pelvis.
- **1-e.** Avalanche burial.
- **1-f.** Explosion.
- **1-g.** Axial load to head: e.g. diving, falling object.
- **1-h.** High voltage/amperage electric shock.

## CRITERIA #2 – PATIENT RELIABILITY

In order for a patient to be considered '*reliable*', a responder must be able to effectively communicate with a calm, cooperative, non-intoxicated, and alert patient while conducting a patient assessment. The responder-patient dialogue must be free from any impediments that may skew the patient assessment and therefore impede the responder from conclusively ruling-out the need for spinal immobilization.

This means that if a patient is unable to actively participate in an assessment then they must be deemed to be *'unreliable'*. '*Unreliable*' patients with evidence of blunt &/or penetrating trauma, consistent with the possibility of having spinal trauma, require spinal immobilization. *'Unreliable'* patients may include, (but not be limited to), the following:

- **2-a.** Patients who have a speech &/or hearing impairment or who do not speak the same language as the responder(s).
- **2-b.** Young children who may not fully comprehend what is being asked of them by the responder(s).
- **2-c.** Patients who are mentally challenged and who may not fully comprehend what is being asked of them by the responder(s).
- **2-d.** Patients who exhibit signs of intoxication due to known or suspected use of drugs &/or alcohol.

## CRITERIA #3 – LEVEL OF RESPONSIVENESS (LOR)

Patients who have sustained a blunt &/or penetrating trauma, consistent with the possibility of having caused spinal trauma, and who have an alteration in their LOR, are to be spinal immobilized. Patients with an alternation in their LOR would include, (but is not limited to), the following:

- **3-a.** Patients who exhibit any of the following: confusion, combativeness, agitation, etc.
- **3-b.** Patients who exhibit unresponsiveness; pre, post or during the patient assessment performed by the responder.
- **3-c.** Patients who have experienced a LOR or an alteration in LOR of ≥ 3 minutes, regardless of how they present at the time of assessment.
- **3-d.** Patients who exhibit a LOR with either a vague, conflicting or absent history of the events.
- **3-e.** Patients who perseverate*, or exhibit retrograde* or antegrade* amnesia.

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| *Perseverate: | To repeat something incessantly or redundantly. |
| *Retrograde Amnesia: | Amnesia in which the lack of memory relates to events that occurred before a traumatic event. |
| *Antegrade Amnesia: | Amnesia in which the loss of memory relates to events that occur after a traumatic event; there is inability to recall new information. |

## CRITERIA #4 – VERBAL ASSESSMENT

Patients who have sustained a blunt &/or penetrating trauma, one consistent with the possibility of having caused spinal trauma, and who have findings consistent with the list below as part of a Verbal Patient Assessment, are to be spinal immobilized. Note this list is not exhaustive.

- **4-a.** Patients who complain of any spinal pain without being palpated; at rest or upon movement.
- **4-b.** Patients who when questioned respond affirmatively to having spinal pain since the injury was sustained.
- **4-c.** Patients who have experienced a previous spinal fracture(s).
- **4-d.** Patients who when questioned report parasthesias.

## CRITERIA #5 – NEUROLOGICAL HISTORY AND EXAMINATION

Patients who have sustained blunt &/or penetrating trauma, and who have one or more of the findings listed below as part of a Neurological Examination, are to be spinal immobilized. Note this list is not exhaustive.

- **5-a.** Patient reports **Numbness, Tingling** and/or **Shooting Pain** (parasthesias) – unilateral or bilateral
- **5-b.** **Weakness** found on examination – unilateral or bilateral.

## CRITERIA #6 – PHYSICAL ASSESSMENT

Patients who have sustained a blunt &/or penetrating trauma, and who have one or more of the findings listed below as part of a Physical Patient Assessment, are to be spinal immobilized. Note this list is not exhaustive.

- **6-a.** Spinal pain is elicited when palpated.
- **6-b.** Presence of multiple injuries.
- **6-c.** Patients that are 65 years of age or older.
- **6-d.** Presence of deformity (i.e. wound, contusion, hematoma) to the spine (neck &/or back).
- **6-e.** Presence of distracting painful injury*.

*Distracting Painful Injury (DPI): Injuries that may override the pain of a potential spinal injury, essentially masking the symptoms of a spinal injury by distracting the patient to the point that it compromises the ability for a responder to accurately assess a patient. They include, (but are not limited to), long bone fracture, large laceration, large burn, visceral injury, etc. A DPI alone, without other positive findings, such as a positive MOI, is not reason enough to provide spinal immobilization (i.e. a patient with a fractured ankle without a positive MOI with no history of head &/or thoracic trauma). It should also be understood that while a fracture may qualify as a distracting injury for one patient, an acute stress reaction may be sufficient for another.

## CONSIDERING FACTORS

- A responder should initiate spinal immobilization procedures in accordance with their training standards and within their scope of practice.
- Patients presenting with a history of degenerative bone disease should be treated with a higher level of suspicion for possible spinal injuries.
- Local policies and procedures may differ from site-to-site. Consult with your supervisor for site specific directives that may affect these guidelines.
- In the non-urban environment, spinal immobilization may be applied as a prophylactic procedure. In addition, it may be applied where a spinal injury 'rule-out' is delayed in order to facilitate the movement of a patient to a warm and controlled environment. In this situation standard spinal precautions must be taken prior to and during transport of these patients until a thorough 'rule-out' is conducted.

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