

Criteria: Any patient with either a mechanism of injury **OR** a complaint or findings indicative of a potential spinal injury.

Manual cervical spine immobilization is recommended until evaluation and/or immobilization are complete. The default is to immobilize the cervical spine, and if there is any doubt or concern during evaluation, immobilization should be maintained.

1. Is there a significant **mechanism of injury**?
 - A. High risk mechanisms are events that have the potential for the transfer of a large amount of energy to the spine. High risk mechanisms include (but are not limited to): vehicular ejection, motorcycle accidents, long falls, and diving injuries.
 - High risk mechanism injuries should be immobilized by BLS personnel, and any removal of spinal immobilization should occur under management by ALS personnel.
 - B. Have a lower threshold of concern when evaluating mechanisms of injuries at extremes of age, or for patients with arthritis, cancer, or underlying spinal/bone disease.
 - Current guidelines suggest age ≥ 65 years or ≤ 3 years constitute higher risk populations.
 - C. Patients without any mechanism of injury do not require immobilization.
 - D. Patients with a suspected mechanism of injury should be immobilized initially until a spinal assessment is completed.
2. Further spine assessment should occur only after identified life threats are addressed by the primary assessment, the patient has undergone a clinical evaluation and secondary assessment, and the situation permits.
3. Perform a detailed spinal assessment. The evaluation should be careful, deliberate, and documented:
 - A. Is the patient **alert and evaluable** with a **normal mental status**?
 - B. Is there any evidence of **intoxication**?
 - C. Is the patient complaining of **symptoms** of a spinal injury?
 - D. Is there a **focal deficit** on neurologic exam?
 - E. Does the patient have a clinically **distracting injury**?
 - F. Does the patient have **point tenderness** over the cervical spine
 - G. **ONLY** if the answer to question A is "Yes" **and** questions B-F is "No":

Does the patient have any pain with gentle **range of motion**?

If the patient is not alert or evaluable, or if the answer to any other question is "yes", immobilization is indicated

4. If the answer to question 3-A is "Yes" and the answer to all the questions in section 3B-F are all "No", then the patient does not require spinal immobilization.

A spinal assessment leading to removal of spinal precautions must include all the components outlined in section 3.

5. Patients with penetrating trauma and no clinical signs, symptoms, or exam findings of spinal injury do not require spinal immobilization.
6. If patient requires immobilization, categorize patient into **high risk** or **low risk**.
 - **Low risk** patients include an evaluable patient with pain ± tenderness, but no neurological deficits.
 - **High Risk** patients include a patient with neurologic symptoms or deficits and/or a high risk mechanism of injury who requires immobilization. In Skagit County, high risk mechanisms include: Vehicular ejection, motorcycle accidents with separation from the bike, long falls (>15 ft or clinical concern), and diving injuries. Falls with suspected axial loading involving a non-ground level fall from distance and impact directly on the head should generally be considered high risk
7. Immobilization for **non-ambulatory** patients:
 - A. Place cervical C-collar.
 - If an appropriately sized C-collar is not available, use towel rolls and tape to immobilize the head. (Do not apply tape over chin or throat.)
 - B. Use rigid extrication device (e.g., long board) as needed to move patient.
 - Rigid long spine boards shall be used primarily as a patient movement device, such as in patient extrication from difficult or dangerous conditions. They may be used in patients requiring CPR, who are clinically unstable (e.g., intubated), who are uncooperative, and/or for whom expedited transfer is indicated.
 - Patients should be removed from rigid extrication device as soon as possible unless removing the patient interferes with critical treatment or interventions.
 - Infants and children found in car seats may remain in their car seats to facilitate transport if other injuries do not preclude need for further access/intervention.
 - C. **High risk** patients should be carefully immobilized.
 - If situation permits and splint is available, a full body vacuum splint is the preferred immobilization device for **high-risk** patients.
 - If a vacuum splint is not available, providers should make efforts to reduce secondary injuries as a result of immobilization (e.g., padding) as immobilization is known to cause pressure injuries seen within relatively short periods.
 - D. **Low risk** patients may be moved to the gurney using a rigid extrication device, but if possible, the device should be removed once the patient is on the gurney.
 - The head may be supported with head block or similar device to limit rotation.
 - Secure patient with seatbelt in position of comfort if situation permits.
8. Immobilization for **ambulatory** patients:
 - A. Place cervical C-collar.
 - If an appropriately sized C-collar is not available, use towel rolls and tape to immobilize the head. (Do not apply tape over chin or throat.)
 - B. Allow self-extrication and assist to gurney.
 - The head may be supported with head block or similar device to limit rotation.
 - Secure patient with seatbelt in position of comfort if situation permits.

9. The C-collar may be removed if it is interfering with airway or airway placement, or if it is causing extreme distress to the point of potentially increasing patient movement.
 - The C-collar must be opened and manual stabilization should be maintained when a supraglottic airway or intubation is performed.
 - If the collar is removed due to patient distress, document reason.

10. Special Circumstances:
 - A. Helmet removal considerations:
 - Football and ice hockey helmet may be left in place as long as the airway is not affected and the spine can be secured in a neutral, in-line position, and the shoulder pads are left on.
 - Motorcycle helmets come in various types. Some may fit the same criteria and allowed to remain in place as long as the spine can be secured in a neutral, in-line position. If not, removal is indicated. (See **Appendix - Helmet Removal**)

 - B. Suspected cervical injury with non-alignment:
 - Perform one attempt to gently realign neck to the neutral, in-line position. Stop if resistance or new/worsening symptoms are encountered.
 - In unable to re-align then secure in original position.

BLS PROVIDERS PERFORMING A SPINE ASSESSMENT SHOULD USE A WRITTEN CHECKLIST (See **Appendix - Spinal Assessment Checklist**). THE RESULTS OF A SPINE ASSESSMENT MUST BE DOCUMENTED AND A COPY SUBMITTED TO THE SKAGIT EMS OFFICE

A note about terminology: Immobilization & Spinal Motion Restriction:

While current techniques limit or reduce undesired motion of the spine, they do not provide true spinal immobilization. For this reason, in recent years the term “**spinal motion restriction (SMR)**” has gained favor over “spinal immobilization,” although both terms refer to the same concept and for the purposes of this protocol the terms are interchangeable. The goal of both SMR and spinal immobilization in the trauma patient is to minimize unwanted movement of the potentially injured spine.

See Next Page for Notes on
Assessment

NOTES ON ASSESSMENT

1. Is the patient **alert and evaluable** with a **normal mental status**?
 - Is the patient calm, alert, and cooperative with a GCS of 15?
 - Can I communicate conversationally with the patient?
 - Any altered level of consciousness or abnormal mentation indicates the patient is **not** evaluable.
 - Acute stress reactions, language barriers, and distracting injuries are all causes for the patient to **not** be evaluable.
 - Is there any clinical evidence of intoxication (any substance)? **An intoxicated patient is not evaluable.**
 - *Immobilization is indicated if the patient is not alert, evaluable, or without a normal mental status.*
2. Is there any evidence of **intoxication**? (Any substance)
 - Any clinical findings of intoxication present on exam?
 - If there is clinical suspicion by the provider, assume intoxication is present (confirmatory testing not indicated)
 - An assessment for intoxication is related to the patient being alert and evaluable, but is kept as an independent question as a cognitive forcing strategy (used formally in C-spine immobilization studies).
 - *Immobilization is indicated if the patient is intoxicated (any substance) as they are no longer an evaluable patient.*
3. Is the patient complaining of **symptoms**?
 - Is there a complaint of new neck or back pain?
 - Is there a complaint of new numbness or weakness?
 - *Immobilization is indicated if the patient has new symptoms.*
4. Does the patient have a clinically **distracting injury**?
 - Long bone fractures are an example of a distracting injury.
 - Clinical judgement is required to determine if an injury is distracting. If in doubt, immobilize the spine.
 - *Immobilization is indicated if the patient has a clinically distracting injury.*
5. Is there a **focal deficit** on neurologic exam?
 - Check wrist flexion and extension against resistance
 - Check dorsal and plantar flexion of the feet against resistance
 - If injuries preclude the above exams, acceptable alternatives are flexion and extension of the great toes against resistance, and spreading of the fingers against resistance.
 - Check for sensation to light touch and sharp sensation on all limbs.
 - *Immobilization is indicated if the patient has a focal deficit.*
6. Does the patient have **point tenderness** over the cervical spine?
 - Spine tenderness is assessed with palpation. The exam needs to be done with the fingers on the skin or light clothing, and should include palpation of all vertebrae.
7. Any pain with **range of motion**? (**NOTE: THE RANGE OF MOTION TEST IS ALWAYS THE LAST STEP OF A SPINE ASSESSMENT**)
 - Assess the range of motion by asking the patient to move the head slowly through a full range of motion. The patient should be informed to stop any movement at the first sign of pain.
 - *Immobilization is indicated if the patient has either tenderness or pain with range of motion*

Matthew F. Russell

Matthew F. Russell, M.D.
Skagit EMS Medical Program Director

TRAUMA - SPINE ASSESSMENT ALGORITHM

