



# SPINAL IMMOBILIZATION



## Escambia County, Florida - ALS/BLS Medical Protocol

### Spinal Immobilization Decision Assessment

Recent studies have shown an increase in mortality for patients with isolated penetrating trauma who are spinally immobilized.

Therefore spinal immobilization is **not recommended** for those patients with isolated penetrating trauma.

Spinal Immobilization is **required** if any of the following is present in the trauma patient (remember **NSAIDS**):

1. Neurological Deficit (e.g. focal deficit, tingling, reduced strength, numbness in extremity).
2. Significant Traumatic Mechanism and extremes of age.
3. Altered Mental Status.
4. Intoxication or Mental Impairment.
5. Distracting Painful Injury – other painful injury that may distract the patient from the pain of c-spine injury.
6. Spinal Exam reveals point tenderness or pain to range of motion to spinal process (e.g. cervical, thoracic, or lumbar-sacral). Any Neck Pain with or without movement.

If all of the above are absent, spinal immobilization is **not required**.

**The decision not to implement spinal immobilization is the responsibility of the Paramedic.**

- Pearls:
1. The patient should be oriented to person, place, situation and time.
  2. Significant mechanism of trauma includes windshield spider, dash deformity, ejection, rollover, and space invasion of >1 foot.
  3. Patient's range of motion should not be assisted. The patient should touch their chin to their chest, extend their neck (look up), and turn side-to-side



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(shoulder-to-shoulder) without pain.

4. Major injuries that may distract a patient's awareness to pain include pelvic fracture, femur fracture, extensive burns or soft tissue injury, acute abdomen, or significant chest injury.

### Spinal Immobilization Decision Flowchart Below



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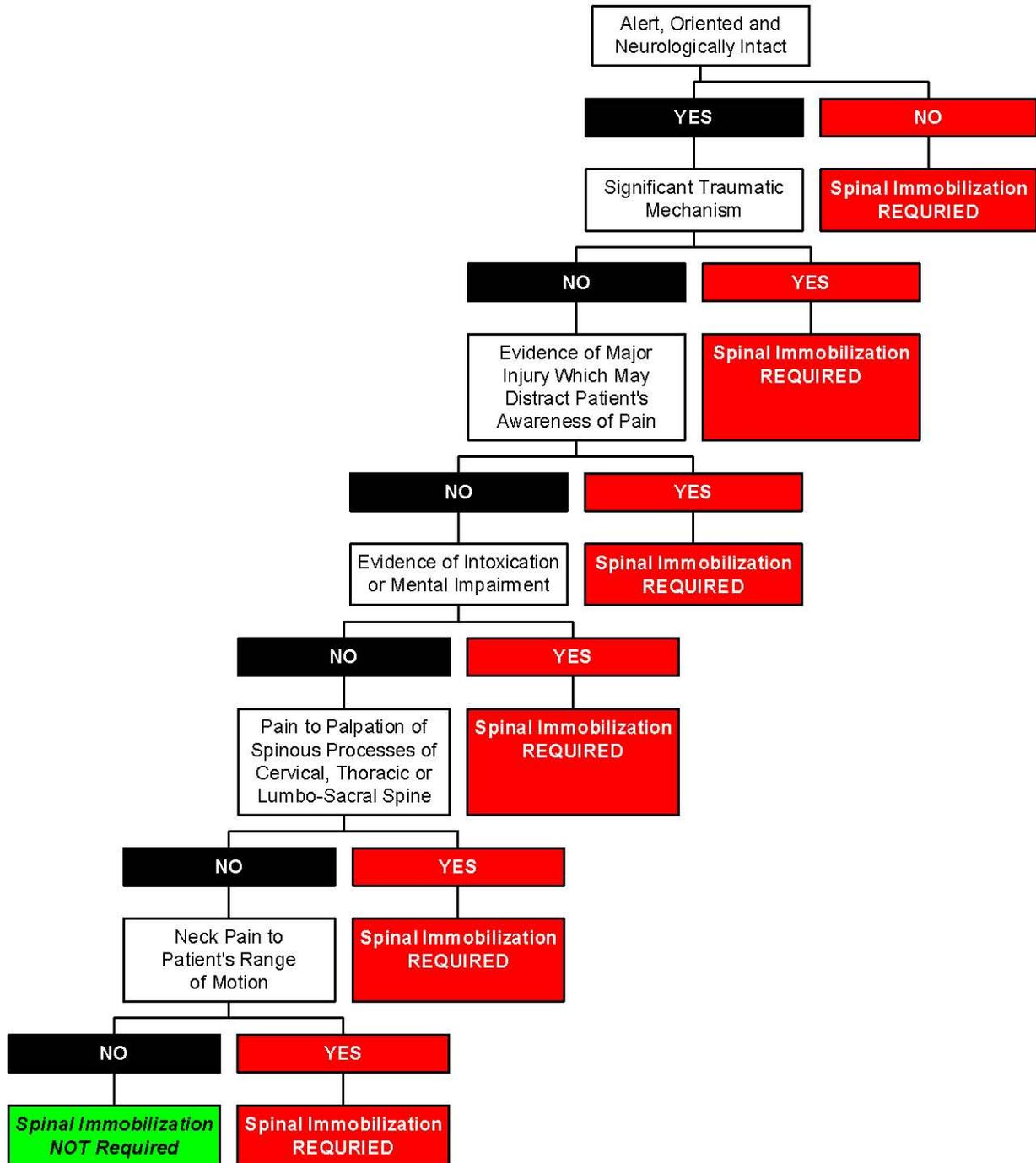
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### Spinal Immobilization Equipment

1. Long spine board.
2. Appropriate cervical collar.
3. Cervical immobilization device (CID).
  - a. Headbed.
  - b. Ferno head block.
  - c. Blanket roll.
4. Straps (minimum of 3).
5. Padding (for head).
6. Tape (2 inch or 3 inch).
7. Additional devices (KED, Pediatric Immobilizer)

### Immobilization of the Supine/Prone Patient

1. Begin with manual immobilization of the head in a neutral, in-line position. Manual immobilization should be provided without interruption until complete patient immobilization is accomplished.
2. Contraindications to placement in an in-line position.
  - a. Neck muscle spasm that prohibits neutral alignment.
  - b. Increased pain.
  - c. Onset of or increase of a neurological deficit such as numbness, tingling, or loss of motor ability.



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- d. Compromise of the airway or ventilation.
  - e. If the patient's injuries are so severe that the head presents with such misalignment that it no longer appears to extend from the midline of the shoulders.
3. Size and apply the appropriate cervical collar. To size the collar, measure the distance, using your fingers, between the bottom of the jaw to the top of the trapezius muscle or according to manufacturer's recommendations.

**Note:**

**In the rare instance an appropriately sized cervical collar is not available, maintain manual immobilization and complete the immobilization process without a cervical collar.**

4. While maintaining manual stabilization with a cervical collar in place:
- a. Log roll the patient.
  - b. Position the backboard next to the patient so that the head of the backboard is approximately 1-2 feet above the patient's head.
  - c. Roll the patient onto the backboard in a supine position.
  - d. Reposition patient, in order to center on backboard, by sliding patient in an upward motion (axial) on the board. Do not slide patient in a direct lateral position, as this may manipulate the spine.
5. Place cervical immobilization device in place
6. Pad the space, as needed, between the back of the head and the backboard to prevent hyperextension of the cervical vertebrae.
7. Secure the patient's body to the board with straps.
- a. Immobilize the upper torso to prevent upward sliding of patient's body during



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- movement and transportation. This is accomplished by bringing straps over the shoulders and across the chest to make an X.
- b. Additional straps must be placed to prevent side-to-side movement of the body on the board. This can be accomplished by placing straps across the mid-to-distal thigh.
  - c. Arms should be placed at the patient's side to prevent movement of the shoulder girdle.
  - d. Secure both feet together to prevent rotary movement of the legs.
  - e. Apply 1 or 2 inch tape directly across the forehead and secure the head while extending the tape under the backboard. **DO NOT** apply tape directly under the chin as this may create an airway obstruction. Tape may be placed across the surface of the semi-rigid cervical collar.

### Immobilization of the Standing Patient

1. Initiate manual immobilization of the head in a neutral in-line position. Approach the patient from the front to eliminate lateral movements.
2. Apply the appropriate cervical collar.
3. Position backboard behind standing patient.
4. Have rescuer holding manual stabilization of the head from the front of the patient pass off the stabilization to a second rescuer that will hold manual stabilization of the head from behind the patient, with arms on either side of the standing backboard. The third rescuer can hold the backboard in place during this switch.
5. Have two rescuers face the patient on either side of the backboard and grasp the board just under each of the patient's arms.
6. With one rescuer at each side of the backboard and the third holding the head, slowly lay the board down. A stop approximately halfway down will be needed to allow the



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rescuer holding the head to reposition hands.

7. When the patient is supine on the backboard, follow steps in previous section to secure patient to the backboard.



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### Vest-type Extrication Device (KED)

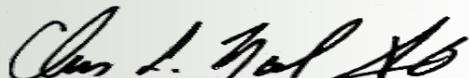
1. Initiate manual in-line stabilization of the head.
2. Apply appropriate cervical collar.
3. Insert device behind the patient. Try to limit movement while positioning the device.
4. Position the device so it fits securely under the axilla of the patient. Open the side flaps and place them around the patient's torso. Make sure the device is centered on the patient.
5. Position, connect and adjust the torso straps. Leave the uppermost strap loose until the head is immobilized.
6. Position and fasten each groin loop. Adjust one side at a time to prevent excess movement of the patient.
7. Place the pad behind the patient's head, filling the void to prevent hyperextension.
8. Position the head flaps. Fasten the forehead strap and apply the chin strap over the cervical collar.



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## Caution:

The handles of the KED should not be used to lift, carry or move the patient.



## Pediatric Immobilizer

1. Begin with manual immobilization of the head in a neutral, in-line position, unless contraindicated (see above). Manual immobilization should be provided without interruption until complete patient immobilization is accomplished.
2. Size and apply the appropriate cervical collar.
3. While maintaining manual stabilization with a cervical collar in place:
  - a. Log roll the patient.



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- b. Position the Pediatric immobilizer next to the patient so that the head of the immobilizer is approximately 6-12 inches above the patient's head.
  - c. Roll the patient onto the backboard in a supine position.
  - d. Reposition patient, in order to center on immobilizer, by sliding patient in an upward motion (axial) on the immobilizer. Do not slide patient in a direct lateral position, as this may manipulate the spine.
4. Pad the space, as needed, between the back of the head and the immobilizer to prevent hyperextension of the cervical vertebrae.
  5. Secure the patient's body to the immobilizer with the attached straps.
    - a. Immobilize the upper torso to prevent upward sliding of patient's body during movement and transportation. This is accomplished by bringing straps over the shoulders and across the chest to make an X. The cross straps velcro into the strap that crosses the abdomen.
    - b. Apply the attached straps across the chest, abdomen and legs. Take care not to leave any space between the straps and the sides of the patient. If the patient is so small that there is a space left between straps and sides of patient, take up space with pads (e.g. blanket, towel, etc.).
    - c. Arms should be placed at the patient's side to prevent movement of the shoulder girdle.
  6. Place cervical immobilization device in place.
    - a. Adjust the head piece to snugly fit around the patient's head. Fasten the forehead strap and apply the chin strap over the cervical collar.

### Note

If a pediatric immobilizer is not available, care should be taken to fill all voids between the patient and the straps with padding.



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## Immobilization of Patient Wearing a Helmet / Helmet Removal

1. The first rescuer kneels above the patient's head. With the palms pressed on the sides of the helmet and his/her fingertips curled over its lower margin, he/she immobilizes the helmeted head in as close to a neutral in-line position as the helmet allows. The first rescuer performs manual immobilization of the head and neck.
2. The second rescuer kneels alongside the patient's torso and opens (or removes) the face shield, checks the airway and breathing, and undoes (or cuts, if necessary) the chin strap.
3. Then the second rescuer places one hand so that the mandible is grasped between the thumb at the angle of the mandible on one side and the first two fingers at the angle on the other side. He/she then places his/her other hand under the neck on the occiput



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of the skull and takes over the in-line immobilization of the head and neck.

4. The first rescuer now releases his/her hold on the sides of the helmet. He/she pulls the sides of the helmet slightly apart, away from the sides of the head. As the helmet is pulled apart from the sides, the helmet is rotated so that the lower end of the facepiece rotates toward the first rescuer and is elevated, clearing the patient's nose.
5. The first rescuer then carefully pulls the helmet in a straight line off the patient's head, stopping before he/she pulls the helmet completely out from under the patient's head or before the curved back of the helmet starts to elevate the patient's occiput to flexion.
6. The second rescuer maintains head and neck immobilization while the first rescuer begins to remove the helmet.
7. Each time the first rescuer stops the movement of the helmet, he/she again takes over the in-line immobilization by squeezing the sides of the helmet against the head. The second rescuer now moves his/her hand which is under the head superiorly, until it is further under the head and again is touching the inferior margin of the helmet.
8. The second rescuer's lower hand will support the head and keep it from dropping when the helmet is finally withdrawn. His/her upper hand should be moved so that the thumb and first fingers grasp the maxilla at each side of the nose, in the maxillary notch. Once his/her hands are securely in place, he/she retakes the manual in-line immobilization.
9. The first rescuer is now ready to remove the helmet completely. The helmet is rotated about 30 degrees following the curve of the head. This causes the posterior lower margin of the helmet to point caudally rather than anteriorly. Now the helmet can be safely removed in a straight line toward the first rescuer's abdomen.
10. Once the helmet has been fully removed, the first rescuer again takes hold of the head and provides manual in-line immobilization from that position. The assessment is continued and the second rescuer applies the cervical collar.

**Note:**

**Two key elements are involved in removing a helmet.**



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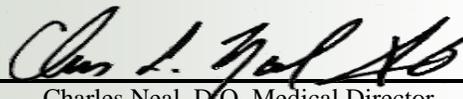
- a. While one rescuer provides immobilization, the other moves. Both rescuers never move their hands at the same time.
  
- b. The helmet must be rotated in different directions: to first clear the nose, and then the back of the head.



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