



## Australian Resuscitation Advisory Network

# TRAUMA Guideline 7 – SPINAL INJURIES

### Scope

#### Who does this guideline apply to?

This guideline applies to all persons with suspected spinal injuries.

#### Who is the audience for this guideline?

This guideline is for use by BLS first responders, including bystanders, first aiders, and health professionals away from a clinical setting.

### General Principles

The possibility of spinal injury must be considered in the overall management of all trauma victims. Traumatic spinal cord injury can still be one of the most devastating long term injuries for the victim and their families.

Spinal injuries can occur at any level of the spine; however the cervical spine (neck) is the most vulnerable to injury, and should be suspected in any victim with injuries above the shoulders. More than half of spinal injuries occur in the cervical region. Suspected spinal injuries of the neck, particularly if the victim is unconscious, should be management carefully and “jaw thrust” is recommended over “head-tilt” if airway management is needed e.g. resuscitation.

In spinal cord injuries the substantive injury usually occurs at the time of the trauma rather than during treatment and transport, however to minimise the extent of the secondary injury, caution must be taken when moving and handling a victim with a suspected spinal injury.

### Recommendations

The Australian Resuscitation Advisory Network (ARAN) makes the following recommendations:

1. Cervical spinal injury should be suspected in all victims with head/neck trauma.
2. Semi-rigid (SR)cervical collars are recommended for the initial management of suspected cervical neck injury in instances where there is an identified risk i.e. high-risk mechanism, significant other severe injuries and where there is pain associated with motor or sensory deficit. (SR) cervical collars should not be used as a routine measure in all trauma cases i.e. as a prophylactic measure.

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3. The efficacy of (SR) cervical collars is dependent on proper fitting technique and familiarity with the individual collar type. Only those appropriately trained in their use should use these devices.
4. Manual stabilisation (regardless of the placement of an (SR) cervical collar is an important measure when moving a victim. In the case of an MVA manual stabilisation can be performed with the victim seated in the car. After road traffic accidents, conscious infants should be left in their rigid seat or capsule until assessed by ambulance personnel.
5. Head immobilisation boards are preferred when transporting victim with suspected cervical spinal injury over a (SR) cervical collar.
6. Spine boards and spinal extrication devices are useful tool for extricating victims, however they are not designed or recommended for victim transport or extended contact with the victim.
7. To maintain a neutral spinal alignment it may be necessary to pad up to 2cm under the head of an adult and up to 2.5cm under the upper shoulders of a child.

## Method

### High-Risk Mechanisms Assessment

There is a significant increased risk of spinal injury when associated with a high-risk mechanism. These include:

- A motor vehicle, motor cycle or bicycle incident as an occupant, rider, or pedestrian.
- A dive or jump into shallow water or water with obstacles or being "dumped" in the surf.
- A sporting accident (e.g. rugby scrum collapse, falling from a horse).
- A fall from greater than 3 m (e.g. ladder, roof).
- Falls in the elderly population at standing height or more.
- A significant blow to the head
- A severe penetrating wound (e.g. gunshot).

### Signs and Symptom Assessment

A victim's symptoms and signs of a spinal injury depend on many factors and can vary in intensity. These symptoms and signs are not always directly related to the seriousness of the spinal injury, however some symptoms and signs are stronger indicators of spinal involvement e.g. paralysis.

Symptoms and signs can include:

- Pain in the injured region
- Tingling, numbness in the limbs and area below the injury.



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- Weakness or inability to move the limbs (paralysis).
- Altered or absent skin sensation.
- Head or neck in an abnormal position.
- Signs of an associated head injury.
- Breathing difficulties due to paralysis of respiratory muscles.
- Loss of muscle tone.
- Low blood pressure with no other suspected cause.
- Loss of function in limbs.
- Loss of bladder and/or bowel control.
- Priapism (erection in males following trauma).

### Moving the Spinal Victim

The log roll is a manoeuvre performed by a trained team, to roll a victim from a supine position onto their side, and then flat again, so as to examine the back and/or to place or remove a spine board.

### Indications for a (SR)Cervical Collar

There are several events that are considered low-risk factors for cervical injury and therefore do not routinely need additional spinal/cervical support/management. These include, casualties where there is a normal range of spinal movement and:

- A casualty in a simple rear-end MVA
- A casualty in a sitting position waiting for treatment
- A casualty that is ambulatory after an incident
- A casualty with a delayed onset of neck pain
- Absence of midline cervical spine tenderness

Conversely there are other events and symptoms/signs that are suggestive of a cervical injury requiring minimal movement and additional support. These include trauma where there is:

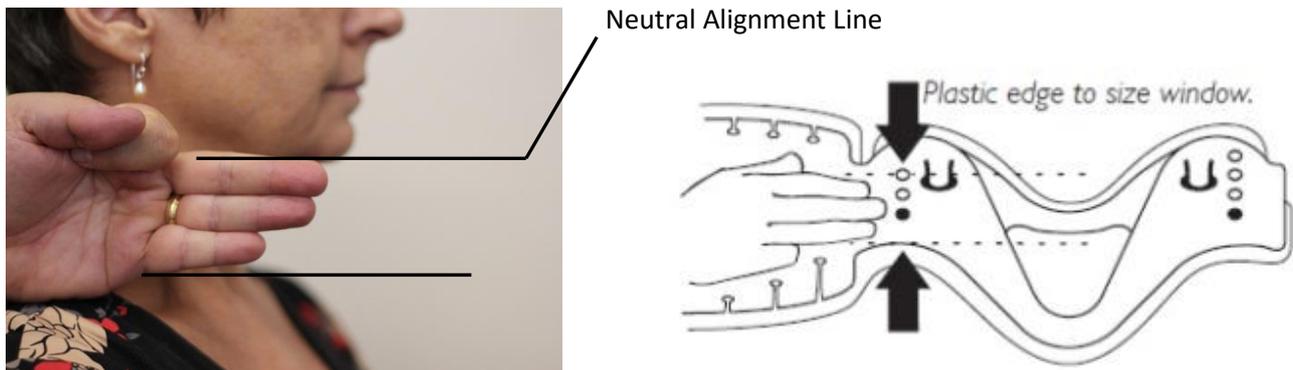
- Intoxicated person with any loss of consciousness.
- Symptoms/signs of a brain injury e.g. focal and neurological changes i.e. not alert and orientated.
- Loss of feeling or function of extremities
- Age > 65 years
- Neck pain at rest
- Pain with axial load i.e. pressure on top of head
- Tenderness to neck in a 2 cm band anywhere from back of head to level of shoulders
- Pain when rotating neck 45° left and right
- Causes by a defined "Dangerous Mechanism":
  - Fall from > 1m or 5 stairs
  - Axial injury e.g. diving
  - MVA > 100 km/h, rollover or ejection from vehicle
  - MVA involving recreational vehicle
  - Cycle collision

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## Correct Sizing and Fitting of (SR) Cervical Collars

The correct use (including sizing and fitting of (SR) cervical collars is critical in ensuring their effectiveness and in minimising complications.



1. The first step is sizing the collar correctly. Whether using a “multi-fit” or single size collar system, the sizing method is basically the same i.e. measure (using the fingers of one hand) the distance between the point where the casualty’s trapezius muscle meets the neck to the neutral alignment line. Transfer this measurement to the side of the collar. On “multi-fit” collars move the adjustment peg to match the finger measurement taken earlier and the hard plastic edge. On single size type collars, compare the finger measurement against collars until you match the distance from the sizing window and the hard plastic edge of the collar (not the soft foam).
2. Fold and position the chin support (as required).
3. Bend the collar back and forward along its length to soften and shape the collar (Figure 1).
4. Whilst an assistant maintains support and manual alignment of the neck,(and holding the collar in one hand), place the collar firmly against the upper chest and slide it up underneath the chin. The edge of the collar should align with the line of the chin. If the collar is not level with the chin is the wrong size.



Figure 1



Figure 2

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5. Whilst holding the front of the collar in place the rear of the collar is wrapped firmly around the casualty neck and the Velcro strap fastened. The (SR) Cervical Collar, being an interim support device is not designed to completely immobilise the cervical collar i.e. manual stabilisation and/or transport restraint are still required. (Figure 2)
6. If supine, the collar should be passed under the neck using the natural hollows rather than moving the neck to pass the collar. The front of the collar is then positioned as above and then the Velcro secured. (Figure 3 and 4)



Figure 3

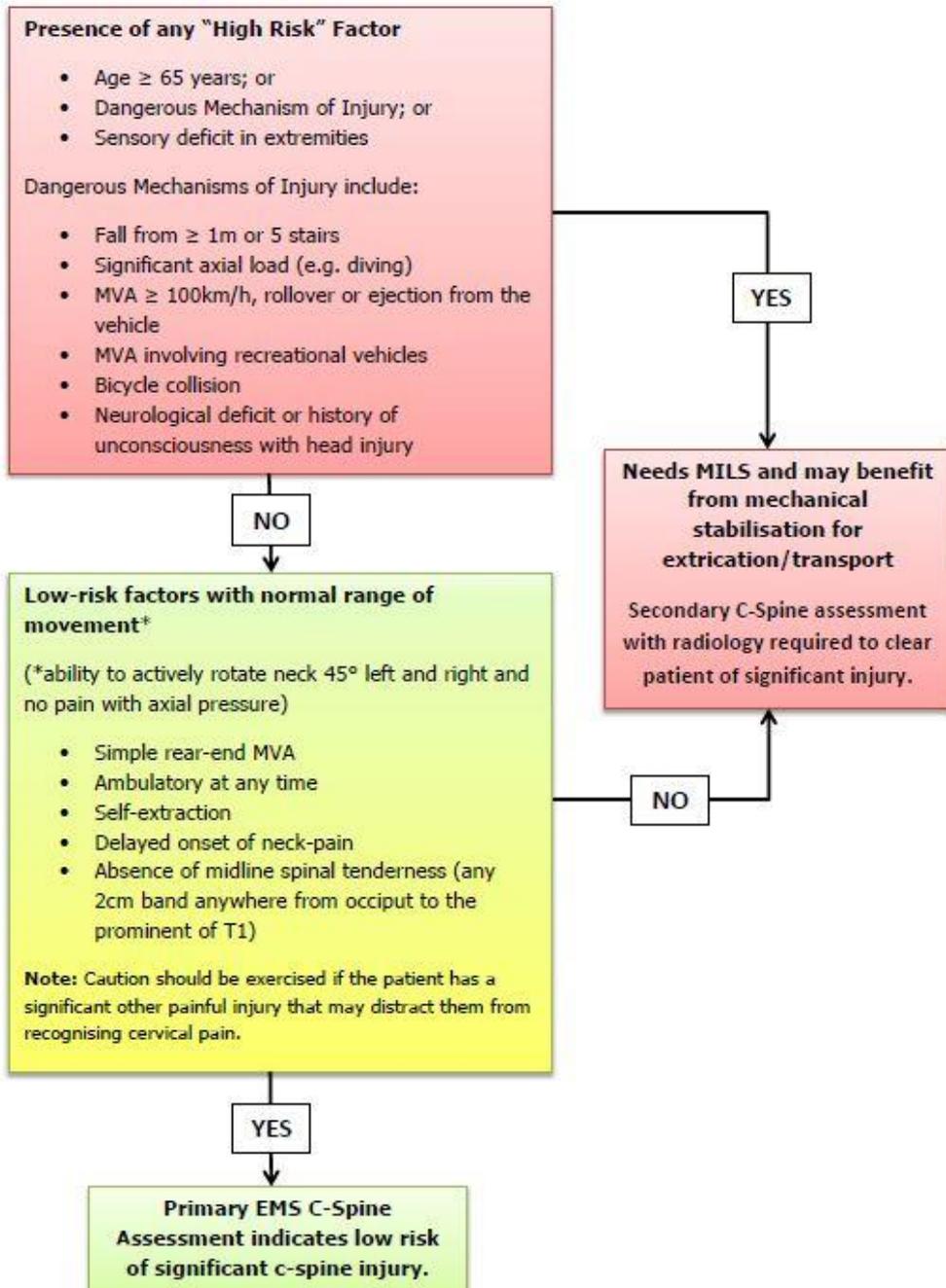


Figure 4

A (SR) Cervical Collar is not a long-term measure and if applied to provide appropriate support is not overly comfortable for casualties.

To maintain a neutral spinal alignment it may be necessary to pad up to 2cm under the head of an adult and up to 2.5cm under the upper shoulders of a child.

## EMS Primary C-Spine Assessment



ARAN 2016 – Adapted from the Canadian C-Spine Assessment and the Nexus Criteria