Consensus Statement:
Clinical Practice Guideline for Cervical Spine Injuries
May 2017

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Evidence considered in reaching the consensus statement:

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PREAMBLE:

This consensus statement is a clinical practice guideline for trauma patients who have suffered a cervical spine injury following trauma, either as an isolated injury or as one of a complex of injuries. It is based on current best practice and generally accepted scientific literature, and builds on practices already in use in the province. It acknowledges that the geography, population, and availability of specialized services in New Brunswick provide a unique perspective to be considered in any overall recommendations for the care of these patients.

SCOPE:

The statement deals with the preferred guidance for adult and pediatric patients who have suspected acute cervical spine injury following trauma, including stable or unstable cervical spine fractures, and includes guidance for acute care and transfer and follow-up of patients discharged from emergency departments. Management of thoracolumbar fractures is outside the scope of this document.

BACKGROUND:

1. Cervical spine injuries occur in 2-6.6% of adult patients, and in 1-3% of pediatric patients subjected to blunt trauma. Reports suggest that 4-8% of significant cervical spine injuries will be missed or delayed.

2. Accepted guidelines at this time still recommend the use of collars in the prehospital and interfacility transfer settings until clearance of the cervical spine is achieved. For patients who require transfer to another facility for definitive diagnosis and care, this may result in a rigid extrication collar remaining in place during a trauma patients stay in the first Emergency Department (ED). The rigid extrication collar is acceptable, provided the rigid collar is removed as soon as possible, and ideally within 24 hours. If a rigid collar continues to be required, exchange with an Aspen-style collar is recommended as soon as practical.

3. Complications of rigid collar use include risk of decubitus ulceration, raised intracranial pressure and limited airway and venous access. Rigid collars should be removed as soon as clearance of the cervical spine is achieved, even in intubated or obtunded patients.

4. A suggested algorithm for clearance of the pediatric cervical spine in reliable and unreliable patients from the Pediatric Trauma Society is included in Appendix A. Early neurosurgical or pediatric spine surgeon consultation is recommended for pediatric patients under the age of 8 years and special caution is advised in patients under the age of 2 years.

5. Among obtunded and intubated patients, a meta-analysis of CT versus plain radiographs of the cervical spine reveals a sensitivity of 98% for CT versus 58% and as low as 38% for plain radiographs. Therefore, CT imaging of the cervical spine is recommended for all obtunded and/or intubated patients, as well as those with the potential for significant injury to any two of head, chest or abdomen.

   A CT scan of the cervical spine including the occiput to thoracic vertebra 2, with axial, coronal and sagittal views is highly predictive of bony (>95%) and ligamentous injury, even in obtunded, intubated patients. The risk of missing an unstable or clinically significant cervical spine injury with a high quality CT is 0.04-0.2%.

6. In obtunded patients MRI does not offer significant benefit, except in patients with neurological deficit and/or evidence of cervical spine instability. In the emergency phase of care, MRI should not be considered unless recommended by orthopedic spine surgeon or neurosurgeon.

7. In pediatric patients, high quality radiographs should be used when possible to lessen the risk associated with radiation. CT scans should be reserved for patients in which there remains a high clinical or radiologic suspicion of injury, those where adequate imaging is not obtained or those with potential for significant injury to any two of head, chest or abdomen.

8. Patients under the age of 8 years have a higher risk of upper cervical spine injury. Pediatric patients undergoing a CT head scan for isolated head trauma should have C1-3 imaged during the same scan.

9. In general, early mobilization of admitted patients with cervical spine injuries, including those with neurological deficits who have been stabilized, is associated with fewer complications, and better outcomes.

10. Spine and neurosurgical specialist consultation is available in New Brunswick for discussions of stability, neurological symptomatology and findings, or any other concerns regarding management of patients with cervical spine injuries. Access via the Toll Free Trauma Referral System is recommended.

RECOMMENDATIONS:

Pre hospital: Adult and Pediatric Patients

1. The NB Trauma Program Consensus Statement: Pre-hospital and Inter-hospital Use of long Spine Boards (November 2014, available online at www.nbtrauma.ca) and which also provides guidance on the use of rigid extrication collars and scoop stretchers) remains current.

2. Prehospital clearance of the cervical spine in patients under the age of 16 years is not recommended.

3. Patients who are greater than or equal to 16 years of age and are alert, cooperative and have no neurological complaints or findings should have the Canadian C-spine Rule (Appendix B) applied. If cleared based on these results, these patients do not require a collar or other immobilization.

Emergency Department: Adult Patients (greater than or equal to 16 years)

1. Adult patients who are alert, cooperative and have no neurological complaints or findings, the NB Trauma Program recommends use of the Canadian C-Spine Rule (Appendix B) for clearance of the c-spine in trauma. Application requires a competent physical examination with an understanding of the mechanism of injury, and adherence to the rule. Imaging may not be necessary and the collar may be removed in patients cleared with appropriate use of this rules. Patients who fail to be cleared should remain in a rigid collar and be imaged.

2. In low risk adult patients, high quality 3 view radiographs may be used if there is clinical concern for cervical spine injury, with CT being the preferred imaging modality.

3. All patients considered to be at high risk of cervical spine injury should be imaged with axial CT imaging with coronal and sagittal reconstructions. Positive findings warrant consideration of entire spine imaging. Some of these patient types include:
    a. symptomatic patients,
    b. those with significant degenerative conditions of the spine
    c. patients with neurological deficit including those reporting paresthesia
    d. obtunded patients or those intubated or under chemical sedation

4. Elderly patients and patients with degenerative spine conditions such as ankylosing spondylitis, warrant a lower threshold for imaging via CT.

Emergency Department: Pediatric Patients (less than 16 years)

1. Pediatric and adolescent patients suspected of having cervical spine trauma can be evaluated using the algorithm noted in Appendix A. Pediatric patients not cleared in this way should be discussed via the Toll Free Trauma Referral System with an orthopedic spine surgeon or neurosurgeon.

2. Pediatric patients at high risk of cervical spine injury should be imaged with CT. This includes pediatric patients where CT imaging of other structures is being performed. Early consultation via the Toll Free Trauma Referral System with an orthopedic spine surgeon or neurosurgeon is suggested.

3. In the face of negative CT, MRI imaging should be reserved for those patients with persisting symptoms and for those with neurological deficit, in consultation with an orthopedic spine surgeon or neurosurgeon. MRI is superior to flexion extension x-rays in determining ligamentous damage.

4. Flexion extension radiographs of the cervical spine are not indicated in acute trauma.

Stability of c-spine fracture:

1. Any patient who potentially has an unstable cervical spine fracture should have spinal alignment maintained with supine positioning until stability is determined.

2. Questions of fracture stability, either radiographically or clinically, should be determined in consultation with an orthopedic spine surgeon or neurosurgeon. Access via the Toll Free Trauma Referral System is recommended.

Management: Adult Patients

1. Patients with unstable cervical spine injuries and/or those with neurological deficit or symptoms should result in an early call to the Toll Free Trauma Referral System.

2. Extrication collars should be removed as soon as clearance of the cervical spine is achieved, even in intubated or obtunded patients.

3. Patients should only be discharged from the ED with a c-spine fracture after consultation with an orthopedic spine surgeon or neurosurgeon, accessed via the Toll Free Trauma Referral System. An Aspen style collar may be recommended (Appendix C).

4. Patients discharged from the ED after clearance of their cervical spine should be referred to their primary care provider.

5. Patients discharged from the ED with stable c-spine fractures should be referred to the consulting orthopedic spine surgeon or neurosurgeon for follow-up within 2-4 weeks.

6. Upon discharge from the ED, emergency physicians are encouraged to:
    a. Discuss analgesia requirements with the patient
    b. In consultation with the consulting orthopedic spine surgeon or neurosurgeon, provide specific advice on restrictions to activities of daily living.

Communication:

1. Advice shared between emergency physicians, consulting orthopedic spine surgeons/neurosurgeons and attending physicians should be documented and readily available to health care providers within the patient's circle of care.

GRADE Level of evidence:

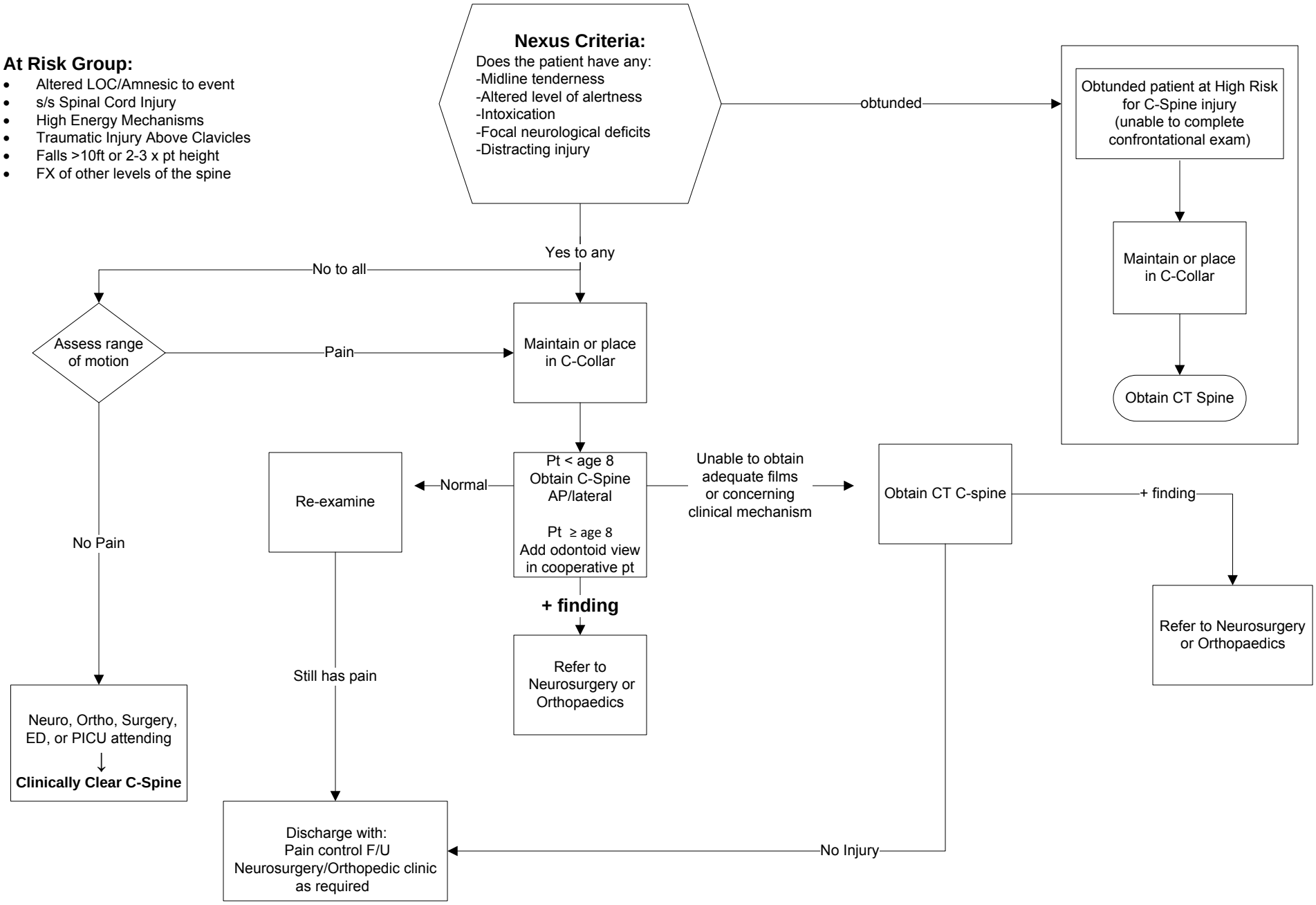
Level 2:

The recommendation is reasonable justifiable by available scientific evidence and strongly supported by expert opinion. This is usually supported by Class 2 or strong Class 3 evidence.

Appendix A

Adapted from the Pediatric Trauma Society:
Initial Evaluation of a Pediatric Patient at Risk for Cervical Spine Injury (June 2016)

Initial Evaluation of a Patient at Risk for Cervical Spine Injury



Rev. 01/2016
Appendix 5.05a

Appendix B

Canadian C-Spine Rule

http://www.ohri.ca/emerg/cdr/docs/cdr_cspine_poster.pdf

Appendix C

Aspen Collar instructions for use

See also YouTube video, available at https://www.youtube.com/watch?v=UUd2JNMPWLM

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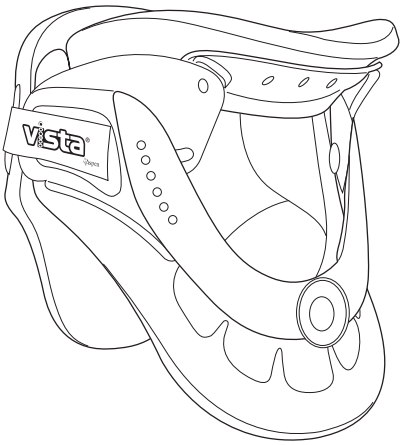
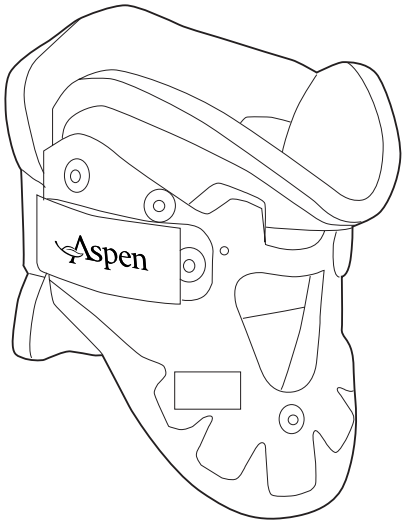
Aspen® CERVICAL COLLAR

CERVICAL COLLAR PATIENT HANDBOOK





Be sure to follow all instructions you have been given by your doctor or nurse.
The information is offered as a guideline only, and is not a medical recommendation.
If you experience sudden neck or back pain numbness or tingling, contact your doctor.

Motion Restriction

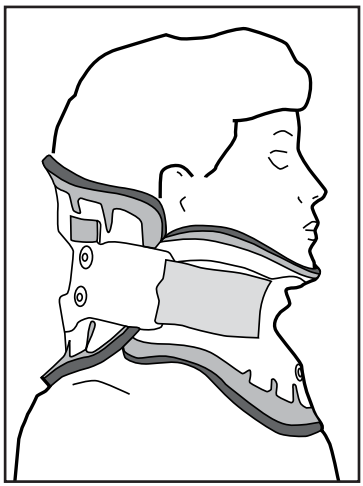
Keeping your head and neck as still as possible is an important part of the healing process. Keep your collar on and properly tightened at all times. Remove it only to wash your face and neck unless you have been given other orders from your doctor or nurse. Remove your collar only with the help of another person.

Proper Skin Care

Pressure, moisture, heat, and dirt can all lead to skin redness and sores. To avoid this, keep your skin clean, dry, and cool. At least once a day, remove the collar and wash your neck and face. At this time, moist or dirty pads should be changed. Check with your doctor or nurse on how to keep your head and neck still while the collar is off. If you notice any skin redness or sores, call your doctor or nurse.

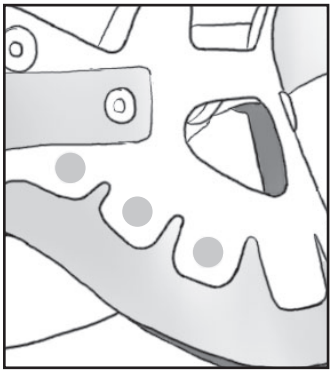
Instructions for Removal, Skin Care, and Re-Application

- Before taking off your collar, gather the supplies you will need: soap, wash cloth, towel, and pads.
- Stand or sit in front of a sink with a mirror. Release the strap on one side. Remove the collar and set it aside.
- Keep your head and neck straight and still. Use a wash cloth to clean your face and neck.
- Rinse away soap and gently dry your skin.
- Remove moist and/or dirty pads. If needed, clean and towel dry the plastic and straps. Attach the clean pads.
- Place the front of the collar so your chin comes to the front edge of the chin piece.
- Place the back panel behind your neck.

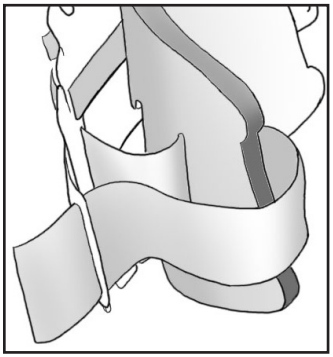


- Connect the straps on both sides and tighten.
- *Tighten the Support Strap until secure and comfortable (Aspen only).*

Pad Replacement



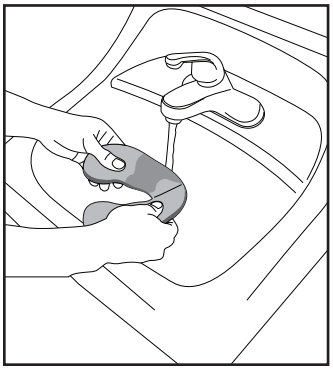
Adjust the pads so grey/green color material side grips the hook dots. The pads must cover all edges of the plastic to avoid touching skin.



To change the back pad, push the hookstraps through the slits in the pad, and then through the slots in the outer edge of the plastic.

NOTE: The padding on the Cervical Collar has a notable white cotton side and a notable gray or green side that covers the foam. The white cotton will always face out and have contact with the skin. Adjust the pads as needed to make sure no plastic touches the skin.

Pad Cleaning



Hand wash the pads with soap and water. Rinse out all soap. Gently squeeze out excess water. Allow to air dry (6 to 8 hours). **Do not place pads in a washer or dryer.**

At-Home Instructions

- Wear your Aspen® Collar for_____weeks
- Keep your collar properly tightened
- Remove it only with the help of a second person
- Remove it only to wash your face and neck
- Wash your face and neck_____ time(s)/day
- Do not drive or operate equipment
- Avoid strenuous activities

SPECIAL INSTRUCTIONS:

_____

_____

_____

_____

_____

Physician:
Name: _____
Phone Number: _____

Fitting Specialist:
Name: _____
Phone Number: _____

Follow-up appointment: _____

Questions? Call: _____

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