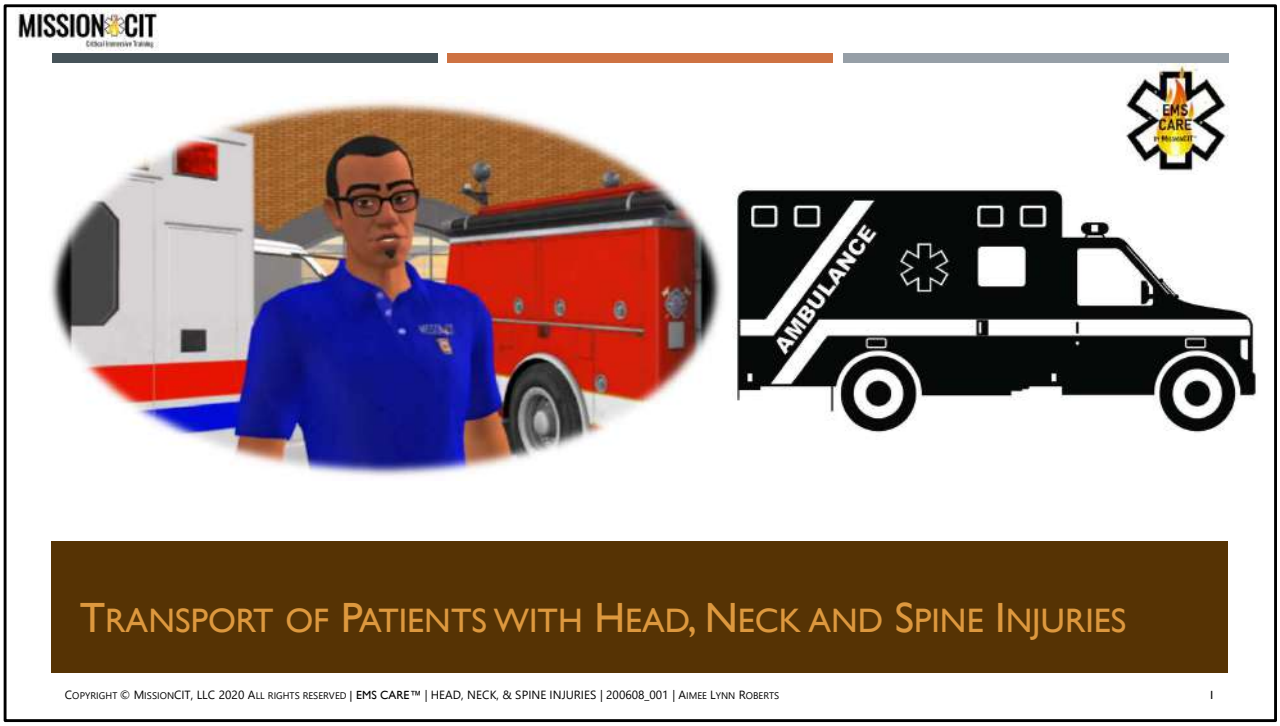


So glad to see you again. Now it's time to bring together what you have learned in the first four lessons as we discuss the Transport of Patients with Head, Neck and Spine Injuries.

As you know from personal experience, these patients are often difficult to assess and exhibit unstable or evolving symptoms. And time is usually of the essence.

Hence, we have broken the lesson into three parts to enable you to focus on each area.

- Part A is an overview of the processes and presents some of the devices you may use.
- Part B discusses how to prep supine, sitting and standing patients.
- And Part C examines the helmet removal process

And if appropriate for your role, you may want to consider additional courses on vehicle extrication to further hone your skills.

Good Studying.

Preparation for Transport | Spinal Motion Restriction

- AANS | CNS | NIH Guidelines
- Assume the presence of spinal injury in all patients who have sustained head injuries
- Use manual in-line stabilization or a cervical collar and long backboard



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The American Association for Neurological Surgeons (AANS) and the Congress of Neurological Surgeons (CNS) provides recent guidelines for cervical spine immobilization. In the prehospital setting, the committee recommends spinal immobilization of all trauma patients with a known or suspected cervical spine or spinal column injury. However, experienced personnel should evaluate the need for immobilization during transport.

Fully awake and communicable patients that are not

intoxicated, without neck pain or tenderness, neurologically intact, and without distracting injuries should not be immobilized. The preferred method of immobilization is the combination of a rigid collar and supportive blocks on a spine board with straps.

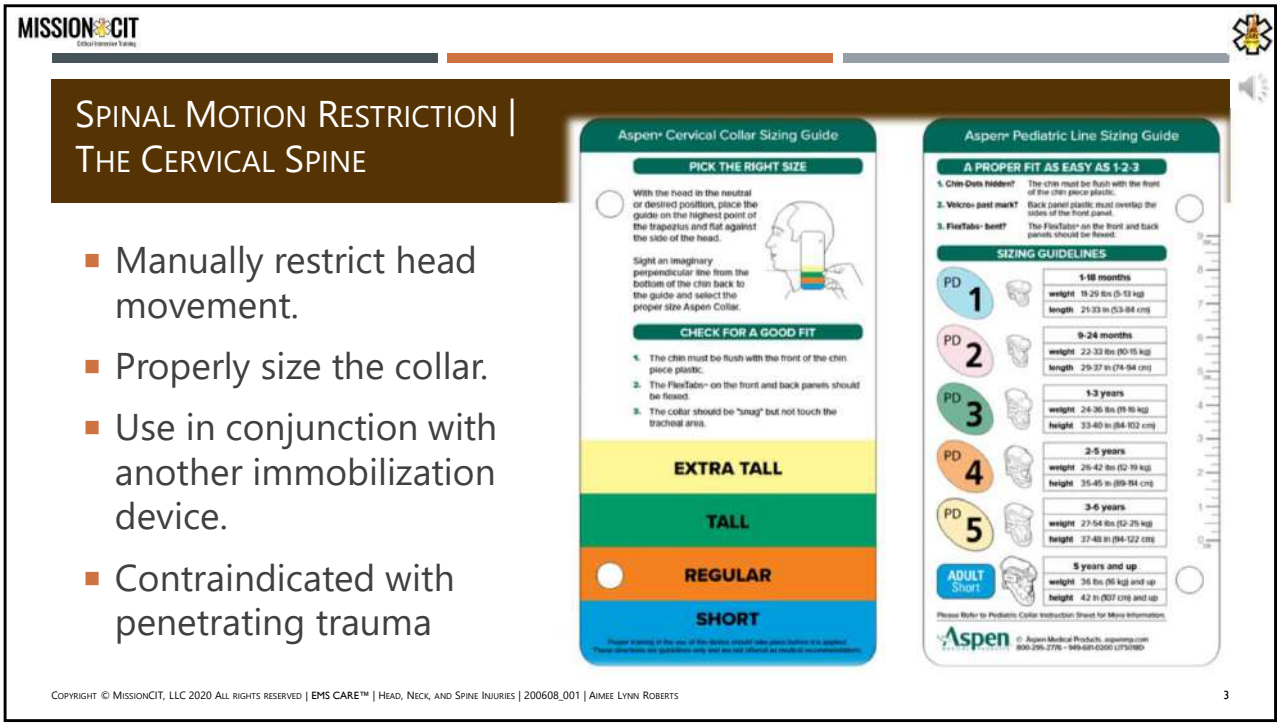
Spinal immobilization in patients with penetrating trauma is not recommended.

Therefore, because any manipulation of the unstable cervical spine may cause permanent damage to the spinal cord, you must assume the presence of spinal injury in all patients who have sustained head injuries.

Remember, during an assessment, pain in the spine may be missed because of shock, or because the patient's attention is directed to more painful injuries.

So, when indicated, use manual in-line immobilization stabilization or a cervical collar and long backboard.

Note that according to the NIH, approximately 5% of patients with spinal injuries experience some degree of neurological worsening, even with good immobilization of the spine. This may be the result of hematomas, edema, hypotension, hypoxemia, or inflammation.



When proceeding with application of a cervical collar:

- Manually restrict head movement by placing your hands on either side of patient's head.
- Properly size the collar
- Use in conjunction with another immobilization device.

Cervical collars come in a variety of shapes, sizes and constructions. A collar is designed to prevent the patient's chin from dipping down toward the chest by placing stiff foam or plastic between the shoulders,

clavicles and chin. This section of the collar is held in place by the posterior section, which wraps around the posterior neck and is anchored in place with loop-and-hook fasteners.

Sizing varies by manufacture as well. Most important, know the collars you have available on your truck and how to size them.

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Spinal Motion Restriction | Applying a Cervical Collar

- Designed to limit flexion, extension, and lateral movement
- Accuracy
- Precision
- Correct Fit



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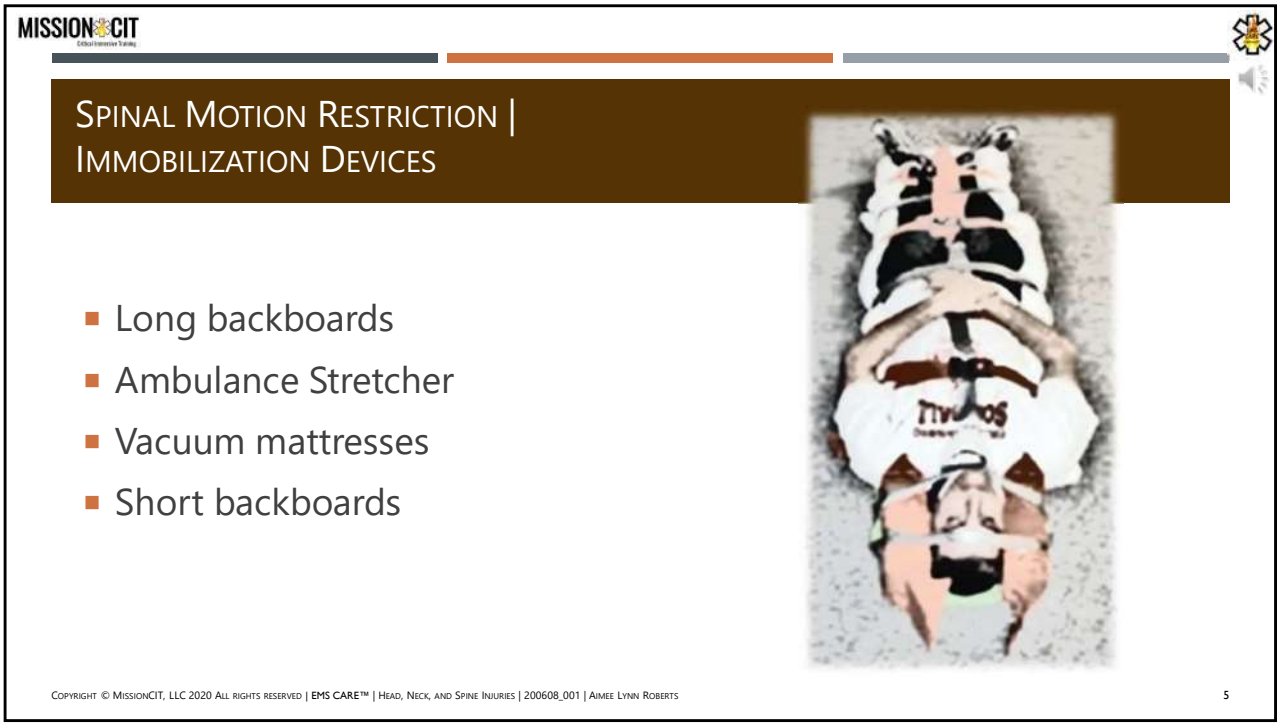
Remember that Cervical spine immobilization devices are designed to limit flexion, extension, and lateral movement.

And, continuing to stress the importance of sizing the collar correctly, note that the height of an individual has no relationship to the length of their neck. Therefore, a very tall male may have a short squat neck, while a petite female's neck may be slender and long.

Placing the cervical collar on the patient should be

accurate and precise. Often, the chin section of the collar is placed in the correct position first, with the rest of the collar carefully wrapped around the neck and affixed with hook-and-loop fasteners. Once secured, the collar should be snug enough to keep your patient from nodding their head downward, but not so tight as to keep from opening their mouth.

Adjust the collar as necessary until it fits correctly; if it is the wrong size, replace it immediately.



According to the N R E M T, spinal motion restriction may be considered specifically for patients who meet conditions such as the NEXUS criteria or Canadian C-spine Rule.

N R E M T now defines spinal immobilization as the use of adjuncts such as a cervical collar or long board, being applied to "**minimize** movement" of the spinal column. This contrasts with the prior practice of "**preventing** movement" of the spine.

Note that although backboards remain useful, the ambulance stretcher often provides sufficient spinal protection.

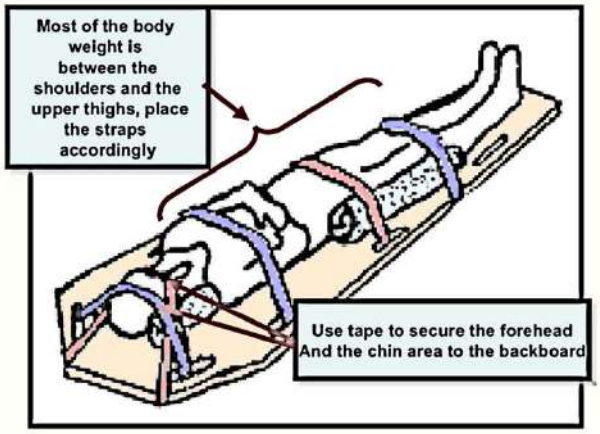
Bottom line is to know the spinal restriction tools you have available. And then do your best to apply the ones most appropriate for the situation, and the patient assessment.

And again, be aware of your local protocol, as many EMS providers are updating S O Ps as to when to use a spine board or vacuum mattress.

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SPINAL MOTION RESTRICTION | LONG BACKBOARDS

- Provide full body spinal immobilization and motion restriction to the head, neck, torso, pelvis, and extremities
- Used to immobilize patients found in any position



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Long backboards have been commonly used to attempt to provide rigid spinal immobilization among EMS trauma patients. However, the benefit of long backboards remains under study.

Reasons why protocols are changing, is because the long backboard can induce pain, patient agitation, and respiratory compromise. Further, the backboard can decrease tissue perfusion at pressure points, leading to the development of pressure ulcers. Hence, the Utilization of backboards for spinal immobilization

during transport should be judicious.

Whether or not a backboard is used, attention to spinal precautions among at-risk patients is vital. These include the application of a cervical collar, adequate security to a stretcher, minimal movement or transfers, and maintenance of in-line stabilization.

Finally, know the spinal motion restriction devices available on your truck. and their methodology for securing the patient.

Spinal Motion Restriction | Vacuum mattress

- An alternative to the long backboard
- Molds to the specific contours of patient's body
- Provides thermal insulation
- Excellent for the elderly or a patient with abnormal curvature of the spine
- Can be used on a supine, sitting, or standing patient



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An alternative to the use of a long backboard is a vacuum mattress. Some advantages include:

- The mattress molds to the specific contours of the patient's body, reducing pressure-point tenderness, and therefore providing better comfort.
- Also, they can be used on a supine, sitting, or standing patient.
- It also provides thermal insulation.
- And they are Excellent for the elderly, or a patient with an abnormal curvature of the spine.

However, a drawback to the device is its thickness as

they cannot be used for patients who weigh more than 350 pounds.

Finally, note that a Patient can be moved onto the vacuum mattress with a scoop stretcher or a log roll.

Spinal Motion Restriction | Short backboards

- Vest-type device and rigid short board
- Designed to immobilize and restrict movement of the head, neck, and torso
- Used to immobilize noncritical patients found in a sitting position



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Short backboards are used to immobilize noncritical patients who are found in a sitting position and have possible spinal injuries. The most common short backboards are the vest-type device and the rigid shortboard. These devices are designed to immobilize and restrict the movement of the head, neck, and torso.

Again, become familiar with the device on your truck and how to administer it to a patient.

That's it for part A of this lesson. I will be right back with part B to discuss preparation for the transport of supine,

sitting and standing patients.