Backboarding the Standing Patient

by Robert Elling and Jon Politis

Often, upon arrival at the scene of a motor-vehicle accident, EMS personnel are confronted with a patient who has already climbed out of the vehicle and is walking around the scene. This so-called "ambulatory" patient is often the one who knocked on someone's door requesting an ambulance for the victims still inside the vehicle. However, if the kinetics of trauma suggest high energy has been applied superiorly to this victim's clavicles, there is frequently good cause to immobilize the patient's neck and spine.

As the EMT approaches the vehicle, he should be reviewing in his mind what type of collision it is (i.e., frontal, rear-end, lateral, rotational, rollover type, ejection). Knowledge of the kinematics of each collision type helps the rescuer make predictions on the initial and secondary impacts that the victim may have sustained, thus helping to predict specific injuries that may be present. In addition, the EMT needs to be alert for ominous signs such as the spider-form cracked windshield. This is typically created by the head of an unrestrained driver or passenger during a frontal or rear-end collision, where the patient's path of exit is often upward over the steering wheel. Since it requires a tremendous amount of energy to fracture automobile safety glass with a blunt object such as a head, the increased chance of a cervical spine injury due to hyperflexion, hyperextension or compression should be obvious to prehospital care providers. Therefore, the well-trained EMT should always ask, "Who sat behind the crack?"

After locating the patient whose head cracked the windshield, an interview and assessment must be done to determine if spinal precautions are to be taken. There are four assessment "red flags" that dictate the need for complete immobilization of the patient. The presence of any one of the following conditions will serve as one of these indicators:

- evidence of blunt trauma from the clavicles, superiorly;
- altered mental status following trauma;
- complaints of neck or spinal pain (including paresthesia – pins and needles – and neck stiffness);
- patient "self splinting" or holding his head or neck.

Once you identify these patients, explain what you are going to do as a necessary precaution and proceed with the job.

> ***"No matter how carefully backboarding is done there is a major problem with this procedure in that there is a direct transfer of energy from the buttocks on up through the spine, which can further complicate the injury."***

Previously, when confronted with a standing patient who complained of one of the "red flags," an EMT would attempt one of two procedures to immobilize the patient. One method involves wheeling the stretcher over to the patient, removing the pillows and placing a long-spine board on the stretcher. The rescuer would then proceed to convince the patient to first sit down, then lay down onto the board with the rescuer's assistance. Unfortunately, no matter how slowly and carefully this is done, there is a major problem with this procedure in that there is a direct transfer of energy from the buttocks on up through the spinal column which can further complicate the injury. The potential for subluxating a fracture site in the spinal column by transmitting energy drop to the column contraindicates this procedure in all cases. *We therefore recommend that use of this technique be discontinued.* If you don't believe that the forces can be transmitted to the injury site, the next time you have a low back injury from lifting patients improperly, have someone tap on the heel of your foot and you will feel exactly where the pain is coming from. Better yet, try plopping your butt down on a hard surface when your back aches from a muscle strain!

The second technique suggested by Prehospital Trauma Life Support (PHTLS) courses is to maintain manual stabilization of the patient, apply an extrication collar and proceed to apply a long backboard,

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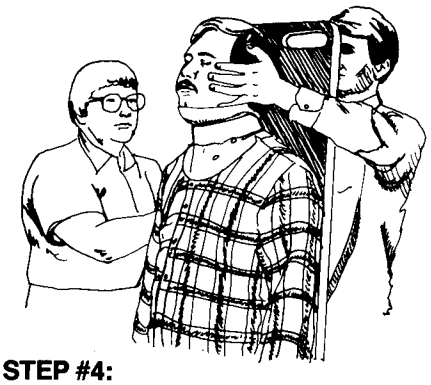
Backboarding The Standing Patient

STEP #1:
MANUAL STABILIZATION

STEP #2:
APPLY RIGID COLLAR

STEP #3:
INSERT LONG BACKBOARD

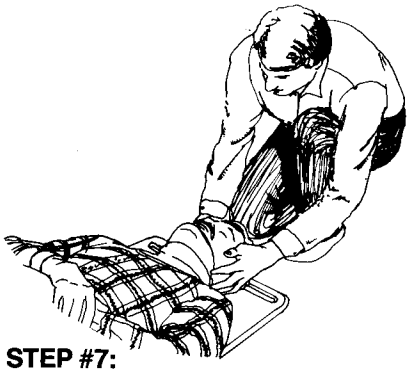


STEP #4:
CENTER THE BACKBOARD

STEP #5:
EMTs GRASP THE BOARD

USE A HANDLE HIGHER THAN
THE PATIENT'S ARMPIT

STEP #6:
SLOWLY LOWER PATIENT



STEP #7:
FULLY IMMOBILIZE TORSO THEN
THE HEAD & NECK

blanket roll, tape and straps to the patient while he is standing. Although this procedure seems to work well when rescuers have practiced this technique, it does have a few major drawbacks:

- The standing patient with a potential spine injury is in an inherently *unstable* position, and must be moved to a supine position as soon as possible. Often the ambulatory patient has altered mental status from concussion, hypoxia, drugs or alcohol, and is in danger of falling.
- Attempting to secure the standing patient to a board is rather time consuming and often difficult to accomplish quickly and effectively in patients who are constantly fidgeting.
- If the body is not tightly secured to the board, but the head is, subsequent movement to the ground may allow the cervical spine to be compromised.

We would like to review an alternative method for dealing with the standing patient who needs spinal precautions using a long board. This technique has the advantages of being a quick, safe and effective procedure that can be easily taught to EMTs. Of course, like all EMS techniques, it is imperative that this procedure be well practiced in the classroom situation prior to initiating the procedure in the field.

There are seven basic steps to the procedure to be implemented as follows. Three rescuers, a set of rigid extrication collars and a full-size long backboard with runners are required for this procedure.

Step One: Position your tallest crew member behind the patient and have him manually stabilize the patient's neck. This person's hands will not leave the patient's head and neck until the entire procedure is complete and the head is taped down to the board.

Step Two: A second rescuer applies a rigid extrication collar to the patient. The purpose of applying the collar is to provide support to the neck as a back-up for the manual stabilization, not to replace the manual stabilization. It is important to note that the literature suggests that even the best collars still allow approximately 30 percent range of motion, which is certainly ample movement to subluxate a fracture site, possibly transecting the cord.

Step Three: The second rescuer carefully positions the long board behind the patient, working around the EMT who is applying manual stabilization. It is often useful to stand directly behind the patient, with elbows spread, to facilitate placing of the backboard by the second rescuer.

Step Four: The second rescuer then looks at the backboard from the front of the patient to do any necessary repositioning in order to ensure that the long board is centered behind the patient.

Step Five: The second and third rescuers, standing on either side of the patient facing him, should reach under the patient's arm on their respective sides with the hand that is closest to the board and grab the backboard at a hole near the patient's armpit or higher. This will keep the patient from sliding off the board as he is laid down.

Actually, once the board is tilted back, the patient will be suspended temporarily by the armpits. To keep the patient's arms secure, the EMTs should grasp the arms at the elbow level with their other hand and hold the arm next to the patient's body.

Step Six: The next step is to slowly lay the board down, tilting it backwards so the head end begins to be lowered. It is important to first let the patient know what you are going to do so as not to make him any more anxious than he probably already is The role of the EMT who is stabilizing the patient's head and neck is to walk backward and squat down, keeping up with the speed at which the board is being lowered.

As the patient is lowered to the ground, the EMT near the head must allow the head to move slowly back to the neutral position against the board.

When patients are in a sitting or standing position, the scapulas shift forward, moving the entire thoracic and cervical spine anteriorly. When any patient is laid down to a supine position, the scapulas move posteriorly, shifting the thoracic and cervical spines to a "neutral" or anatomical position. Caution must be exercised in order not to pad behind the head significantly. When the patient is laid down, the entire spine attempts to move posteriorly and the head ends up in flexion.

Since most cervical injuries are a result of flexion, movement in this direction is particularly harmful. The EMT must understand that his only role is to stabilize the head, allowing it to move back to the board and thus end up in a "neutral" or anatomical position. It is not his job to make any effort to hold back or slow down the lowering of the board. Sometimes the rescuer at the head will have to stand back to keep his chin and chest from actually stopping the board. The role of the two EMTs doing the lowering is to control the lowering so that it is slow and even on both sides. It is strongly suggested that these EMTs move into a squatting position, both for their own spine's health and to avoid injury by lowering with their legs.

Step Seven: The EMT at the head must continue manual stabilization throughout the primary and secondary assessment phase until the body has been appropriately strapped to the board (pelvis, chest, & legs) and a blanket roll has been applied and firmly taped to the board using adhesive tape. Should the rescuers choose to use a commercially made head immobilizer device, such as the Bashaw Cervical Immobilization Device or the Ferno Washington Head Immobilizer, it is imperative that the velcro board pad for these devices be attached to the long board prior to step three. It would be inappropriate to flex the neck to insert the pad at any other point in the procedure after step two.

In summary, we think that we have offered EMTs an alternative to dealing with those patients who are often walking around at the scene of the motor vehicle accident. When well practiced in the classroom setting, this technique can be effectively used by EMTs. The technique, which is currently being taught to New York state EMTs as a part of the Critical Trauma Care Continuing Education course, has been met with much success and enthusiasm. Perhaps this will give us another way of dealing with the patient who sat behind the crack! □