

SPINE IMMOBILIZATION - Random Reflections On Backboarding Mechanics

1. Appreciate the risk. When you tie a patient down on a backboard, you have compromised that patient's ability to clear his own airway if he vomits. **Aspirated vomitus can kill.** You have deprived your patient of the ability to save his own life. That job is now in your hands.
2. Married to head. Patient leader is responsible for manual C-spine immobilization until patient tie-down is complete. Once you grab hold, you're stuck on your knees at the patient's head, with both hands occupied.
 - a. A hand-off to another rescuer is proper if executed competently.
 - b. Depending upon terrain and your footing, stabilizing the patient's head with your knees might be feasible.
3. Verbal response. With conscious patient, remember to insist that patient respond to you verbally; **NOT** by shaking his head.
4. Pain response. With unconscious patient, remember that secondary survey may **elicit sudden response** to pain. Have bystander stabilizing patient's head and neck during exam.
5. Left side favored. If you have a choice (depending upon terrain, patient position, etc.), logrolling onto the patient's left side is preferred. This is because of the anatomy of the left and right bronchi which may reduce the risk of aspiration if the patient's right side is up.
6. O₂ rescuer. Because logroll to left is favored, rescuer responsible for O₂ and suction should be on patient's left.
7. Complications of spinal cord injury:
 - a. Impaired breathing. Motor nerves supplying diaphragm are high in neck (C₃, C₄, C₅) and are rarely injured. Nerves controlling rib motion, however, are lower and can be injured, causing paralysis. Thus patient may be breathing only with his diaphragm, resulting in a respiratory emergency.
 - b. Neurogenic shock. Nerves controlling size and tone of blood vessels may be paralyzed causing abnormal dilation, especially in abdomen and lower extremities. Shock results, so foot of backboard should be raised about 12"; no more because excessive elevation can load abdominal organs onto diaphragm, compromising patient's breathing.
8. Logroll toward rescuers. Always logroll the patient toward the rescuers. This increases stability for all concerned. If patient is found prone, this means that the backboard is sitting in the rescuers' laps as the patient is rolled toward them.
9. Overlap arms. Logrolling rescuers should overlap their arms as they grab onto the patient. This increases stability and coordination. See AAOS text (5th) p. 684 for proper hand and arm position; do not follow OEC text (2nd) p. 235.
10. 3 logrollers. Need three persons on adult patient's torso to logroll effectively: 1 at shoulders and upper chest; 1 between mid-chest and pelvis; 1 between pelvis and feet. Remember: bystanders can be trained.
11. Care in straightening patient's legs. If patient is semi-prone, his legs are probably supporting him in that position. Don't straighten the legs until everyone is in position and ready for the logroll. Otherwise, you may cause the patient to roll prematurely and without adequate support and control.

12. Raising patient's arm. Don't raise patient's arm on the down side over his head to facilitate the roll because of the risk of movement of patient's spine during the maneuver. Instead, roll the patient onto his down arm.
13. C-collar. Apply the C-collar to the patient as soon as feasible, hopefully before any major movement. Compare AAOS text (5th) p. 683 with OEC text (2nd) p. 231.
14. Patient movement. If some extrication from a tight spot is required before the backboard can be applied, remember to move patient in the direction of the long axis of his body; **do not drag sideways**. A half-body extrication device is great in this situation and should be used if available.
15. Scoop stretcher. A scoop stretcher is too flexible for complete spinal immobilization (see OEC text (2nd) p. 179); though it's great in some other applications, such as pelvic and hip injuries.
16. Centering on board. A logrolled patient frequently needs to be centered on the board following the logroll. **Avoid direct sideways movement**; instead, move along the patient's long axis, toward the head of the board (see OEC text (2nd) p. 236).
17. Board placement. Because of the previous tip, before the logroll the board should be placed to extend an extra 8 - 12 inches above the patient's head. Then when the patient is centered, he can be moved up along the board at the same time he is being positioned laterally.
18. Minimum of 10-12 cravats. If straps or webbing are not available for tying the patient down, count on a minimum of 10-12 cravats being necessary.
19. Tying cravats. The preferred knot is 2 or more half-hitches, though because of the cravat's friction, a girth hitch or two probably won't do any harm. Just make sure enough "tail" is left at the end of the knot so it won't come undone.
- a. Note: A square knot slides into a girth hitch when tension is applied to the running end.
 - b. Another note: The maligned granny knot slides into a couple of half-hitches when tension is applied to the running end.
20. Tying off second end of cravat. To tie off the second end of the cravat when it is under tension, first wind the cravat 2 or 3 times around the backboard handle. The extra friction created by these loops will make it easier to tie the half-hitches without losing tension.
21. **Tie down bone, not flab.** Backboard cravats should tie down the patient's skeletal system.
- a. Thus, avoid running a cravat across the patient's abdomen below his rib cage; no useful purpose is served by tying down gut.
 - b. When dealing with the thoracic cage, make sure the arms stay outside of the cravat; if enclosed, the arms get in the way and compromise the tight chest tie-down.
22. Head comes last. Tie down the patient's torso before securing the head. If the patient needs to be logrolled during the procedure because of vomit, it is easier to support the head and C-spine in line with the torso during the roll than to keep the heavy torso in line with a secured head.
23. Secure against long-axis movement. If the patient has to be moved up or down hill to the sled or other transport, use the shoulder cravats to prevent sliding toward the head, and pelvic cravats to prevent sliding toward the feet.