July 2021

Continuous Quality Improvement Review - Spinal Motion Restriction Practices

There has been a push over the last decade or so to modify prehospital practices regarding spinal immobilization including reducing use of long spine boards and selectively, instead of uniformly, treating patients with potential spinal injury. Ultimately our goals are: 1) protect the patient, 2) prevent worsening of injuries, 3) reduce pain, and 4) avoid triggering unnecessary testing in the ED.

We now know that a long spine board actually causes unnatural pressure on the spine which results in increased pain[1-3] while also NOT actually *immobilizing* the spine[4]. This is why we now practice "spinal motion restriction" instead of "spinal immobilization". We also know that cervical collars can cause pain when worn for long periods and patients complaining of neck pain prompt ED physicians to order more CT scans.[5-7] The good news is that we have good guidelines like the NEXUS[8] and Canadian cervical spine criteria[9,10] to determine who needs imaging, and for our purposes in the prehospital setting, who should have a cervical collar placed in the first place. Our spinal immobilization tool uses NEXUS criteria to give guidance on who should, and who might not need to, have a cervical collar placed.

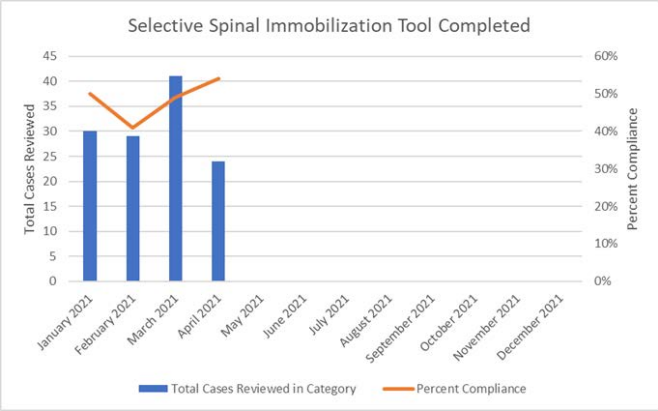
Trauma surgeons, emergency physicians, and EMS physicians got together and published a joint guideline for prehospital spinal motion restriction.[11] From these guidelines, we now have support for making our practices both progressive and safe. The major points of emphasis for our system based on these guidelines and the evidence discussed above are:

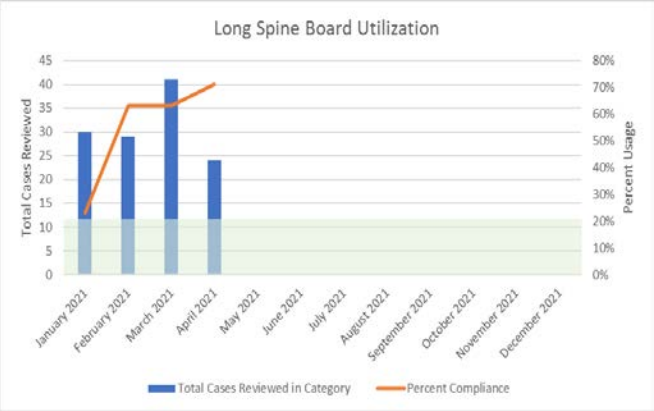
1) Use the spinal immobilization tool when needed (most useful to back up your decision NOT to place a cervical collar or in cases where you are on the fence), to help determine who does and does not need a cervical collar placed.
    a. If the tool says that collar is not needed but your judgement says otherwise, err on the side of caution and document the reason for placing a collar despite the patient not meeting criteria per the tool.
2) If a cervical collar is used, then **full** spinal motion restriction should be used.
3) Full spinal motion restriction can and should be achieved by methods other than a long spine board which should be avoided when possible during transport (though it is acceptable to use for extrication).
    a. A well-padded stretcher to which the patient is secured is specifically listed as an acceptable method of full spinal motion restriction in the joint guidelines. If this is used, though, the stretcher must be flat, not in semi-fowler's position.
    b. A bariatric tarp may be used which can then also be used for patient transfer in the ED.
    c. A new procedure has been added to the pick list – "Full spinal immobilization (no backboard)" – which should be used when appropriate.

We know that there are hospitals and trauma surgeons who give crews a hard time for not doing things, like placing a cervical collar, the way they think they should be done. But we also know that somebody has to start the process of change, and often EMS providers are the ones leading the

way. We want you to do things the right way. If you receive criticism from the hospital side, use the jot form to let us know and we will follow up. If we are following guidelines and doing things the right way, then we can sleep well at night.

Over the last 4 months, our practices have looked like this:





Our target for use of the spinal immobilization tool is 80% or better and our target for use of a long spine board is *less than* 20% of transports. Let's see how much we can improve over the next four months. Thanks for all of your efforts and please reach out to Dr. Stoecklein, Dr. Youngquist, or Medical Division if you have any questions.

References

1. Chan D, Goldberg R, Tascone A, Harmon S, Chan L. The effect of spinal immobilization on healthy volunteers. Ann Emerg Med. 1994 Jan;23(1):48-51.
2. Lerner EB, Billittier AJ 4th, Moscati RM. The effects of neutral positioning with and without padding on spinal immobilization of healthy subjects. Prehosp Emerg Care. 1998 Apr-Jun;2(2):112-6.
3. March JA, Ausband SC, Brown LH. Changes in physical examination caused by use of spinal immobilization. Prehosp Emerg Care. 2002 Oct-Dec;6(4):421-4.
4. Rahmatalla S, DeShaw J, Stilley J, Denning G, Jennissen C. Comparing the Efficacy of Methods for Immobilizing the Thoracic-Lumbar Spine. Air Med J. 2018 May-Jun;37(3):178-185.
5. Hauswald M., and Braude D. (2002). Spinal immobilization in trauma patients: is it really necessary? Curr. *Opin. Crit. Care* 8, 566–570.
6. March J.A., Ausband S.C., and Brown L.H. (2002). Changes in physical examination caused by use of spinal immobilization. *Prehosp. Emerg. Care* 6, 421–424.
7. Leonard J.C., Mao J., and Jaffe D.M. (2012). Potential adverse effects of spinal immobilization in children. *Prehosp. Emerg. Care* 16, 513–518.
8. Hoffman JR, Mower WR, Wolfson AB, Todd KH, Zucker MI. Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. National Emergency X-Radiography Utilization Study Group. N Engl J Med. 2000 Jul 13;343(2):94-9.
9. Vaillancourt C, Charette M, Kasaboski A, Maloney J, Wells GA, Stiell IG. Evaluation of the safety of C-spine clearance by paramedics: design and methodology. BMC Emerg Med. 2011 Feb 1;11:1.
10. Stiell IG, Wells GA, Vandemheen KL, Clement CM, Lesiuk H, De Maio VJ, Laupacis A, Schull M, McKnight RD, Verbeek R, Brison R, Cass D, Dreyer J, Eisenhauer MA, Greenberg GH, MacPhail I, Morrison L, Reardon M, Worthington J. The Canadian C-spine rule for radiography in alert and stable trauma patients. JAMA. 2001 Oct 17;286(15):1841-8.
11. Fischer PE, Perina DG, Delbridge TR, Fallat ME, Salomone JP, Dodd J, Bulger EM, Gestring ML. Spinal Motion Restriction in the Trauma Patient - A Joint Position Statement. Prehosp Emerg Care. 2018 Nov-Dec;22(6):659-661.