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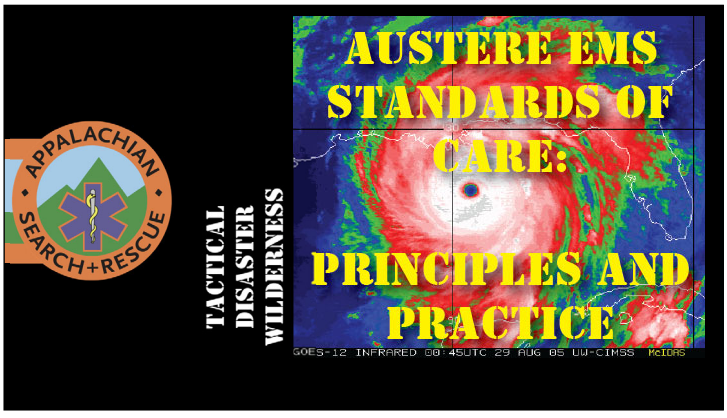
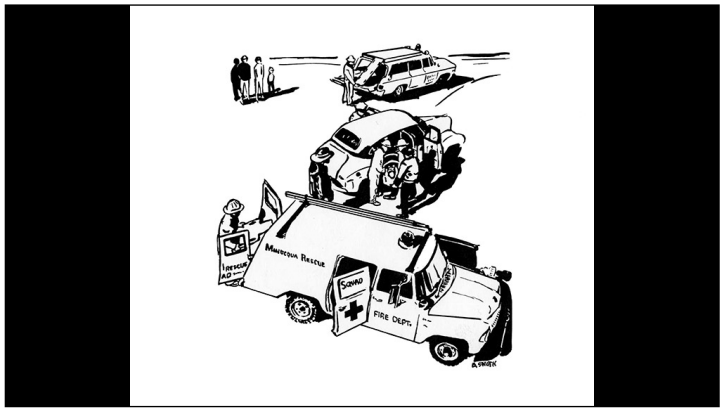


This is an excerpt from an Austere EMS presentation I just gave a couple of weeks ago at the International Trauma Life Support annual conference in Tampa.

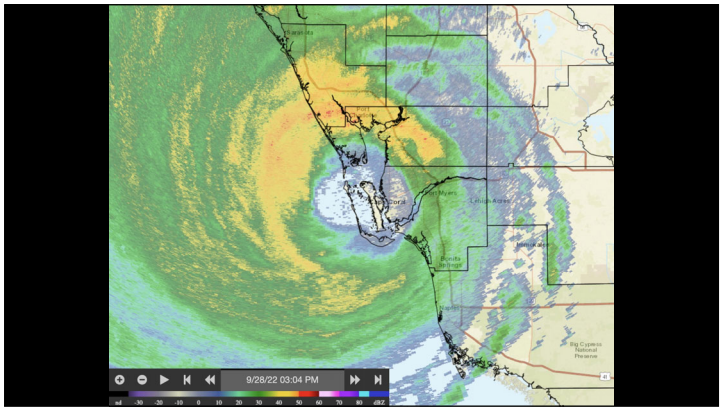
But tonight, I just want to talk, a bit briefly, about spinal cord protection.

As you might or might not know, in EMS, backboards are out. Cervical collars are on their way out. Using the NEXUS criteria to “clear the cervical spine” is in. This started in the wilderness/austere EMS arena and is now percolating out onto the street. Why? We did a study here in Pittsburgh where we strapped fourth-year medical students to backboards to see what happened. And what happened is after 45 minute they had severe pain, unstrapped themselves, and threatened to kill those conducting the experiment. I exaggerate only slightly. But seriously, we know

that people on backboards develop decubiti – bedsores – ischemic butt necrosis – whatever you want to call it – in about 90 minutes. I'm not going to go through all the research, but I'm going to go through the consensus statements derived from that research.



In 1967, the American College of Surgeons published an article called Death in a Ditch in which they recommended using backboards to get people out of car wrecks to save them from being paralyzed by mishandling. This was totally not evidence based! But it has stuck with us for a long time. But it is finally going away.



Scenario: You and your paramedic friend were on vacation. The path of the hurricane suddenly changed, and you were unable to get a flight back home. All either of you have with you is a small personal first aid/medical kit.

(Image: Public domain via Wikimedia Commons, courtesy US National Weather Service)

Once the hurricane passes, and your cellphones are useless, the phones in the hotel are useless, and there is no power or water in the hotel, this is what you see when you get out of the hotel. There are no signs of an EMS or fire response in the area. You and your friend grab your kits and head out to see what you can do to help.

(Photo by Keith Conover. Used with permission. All rights reserved.)

This is a house a couple of blocks away. You hear a cry for help. After assessing for scene safety – adequate – you find a young man trapped by a beam across his ankle. The ankle's not crushed, no concern about crush syndrome, it's just trapped. "If you can just lift this off my ankle I can get out!" "Are you hurt anywhere else?" "My neck and back hurt but I think that's just because I've been stuck here on my side for hours and hours. I didn't injure my back or neck when the beam fell." On exam, he has tenderness on either side of the neck including some mild midline tenderness all up and down the cervical spine. And no other apparent injuries except minor scrapes and bruises. What should you do? Wait for EMS to arrive with an extrication collar before getting him out? Let's look at the literature.

(Photo by Keith Conover. Used with permission. All rights reserved.)

2013

Consensus statement

Pre-hospital spinal immobilisation: an initial consensus statement

D Connor,[1] I Greaves,[2] K Porter,[3] M Bloch,[4] On behalf of the consensus group, Faculty of Pre-Hospital Care

INTRODUCTION

Spinal injuries are thankfully relatively uncommon but have the potential to cause very significant morbidity and mortality. It is reported that between 0.5% and 3% of patients presenting with blunt trauma suffer spinal cord injury (SCI).[1 2] The incidence varies globally and time has yielded increased numbers of injuries annually. American figures estimate an incidence in the region of 40 cases per million per year.[3] In the UK, the majority of traumatic SCI are attributable to land transport (50%), followed by falls (43%), then sport (7%).[4] Of those fractures

Immobilisation is based on the logical premise that preventing movement should decrease the incidence of SCI or further deterioration of existing damage. This is undertaken by, in effect, adding external supports to the body, preventing secondary injury during extrication, resuscitation, transport and evaluation.

Immobilisation is a routinely performed procedure in the prehospital environment. Its potentially serious adverse sequelae and the litigious nature of modern medicine have seen the development of an extraordinarily conservative approach to immobilisation where it is applied in

analysed the references of retrieved articles to identify further sources.

THE DEBATE

Immobilisation is a key concept in most trauma guidelines. The ATLS course recommends that all trauma patients considered to be at potential risk of spinal injury have immediate neck immobilisation.[7] This guidance is founded upon expert opinion rather than definitive evidence and current protocols have a strong historical rather than scientific precedent. In the practice's favour, Reid in 1987 reported that secondary neurological injury occurred in 1.4% of patients with spinal injury diagnosed in the ED whereas the secondary neurological injury rate was 10.5% in those in whom a diagnosis of spinal injury was missed.[8]

However, a full review undertaken by Kwan and colleagues concluded that there is no high-level evidence quantifying the effect of immobilisation versus no immo-

A consensus statement in the British Emergency Medicine Journal says backboards should only be used for extrication from vehicles and not for transport..

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2013

Consensus statement

Minimal patient handling: a faculty of prehospital care consensus statement

R Moss,[1] K Porter,[2] I Greaves,[3] On behalf of the consensus group

INTRODUCTION

Safe and effective patient packaging is a vital step in the safe transport of trauma patients to definitive care. A significant proportion of patients are treated with spinal immobilisation precautions based on their examination findings or on the mechanism of injury.[1] Current UK practice commonly involves the use of a cervical collar and blocks usually secured to a rigid spinal board. Alternatively, and increasingly commonly, immobilisation is achieved using either a scoop stretcher or a vacuum mattress.

BACKGROUND

Spinal immobilisation is a common intervention for the prehospital patient following trauma. Most commonly the patient is

spinal immobilisation. The best practice described is based on the recommendations of a consensus meeting held in the West Midlands in April 2012, where the opinion of experienced practitioners from across the prehospital and emergency care community considered the currently available evidence and reviewed current clinical practice.

The indications for spinal immobilisation are not considered in this statement as they are addressed in other consensus statements.

RECOMMENDATIONS

1. *The long spinal board is an extrication device and should no longer be used for providing spinal immobilisation during transport to definitive care.*

injuries.[5 6] Techniques involving placement on a scoop stretcher and application of spinal immobilisation have been demonstrated to be equivalent, if not superior, to log-rolling and immobilisation on a long spinal board for spinal column movement. A long spinal board is likely to be less comfortable than a vacuum mattress and possibly a scoop stretcher.[7] The risk of tissue pressure injury is reduced when using a vacuum mattress and potentially when using a scoop stretcher due to the increased surface area of contact.

2. *The scoop stretcher should be used for patient transfer and to provide spinal immobilisation.*

The scoop stretcher is a piece of transfer equipment with which the majority of prehospital practitioners will be familiar. Although it currently does not satisfy all the ideals for a prehospital spinal immobilisation device, it was felt by the consensus working group that its routine use has a number of advantages. The main advantage of using a scoop stretcher is that only a minimal risk, sufficient to allow insertion of the blades under the patient, is needed

Another consensus statement in the Emergency Medicine Journal says backboards should only be used for extrication from vehicles and not for transport. Scoop stretchers should be used for any transport less than 45 minutes. Log rolls are bad if there is spinal injury. Just like backboards, C-collars have never been shown to help or prevent harm.

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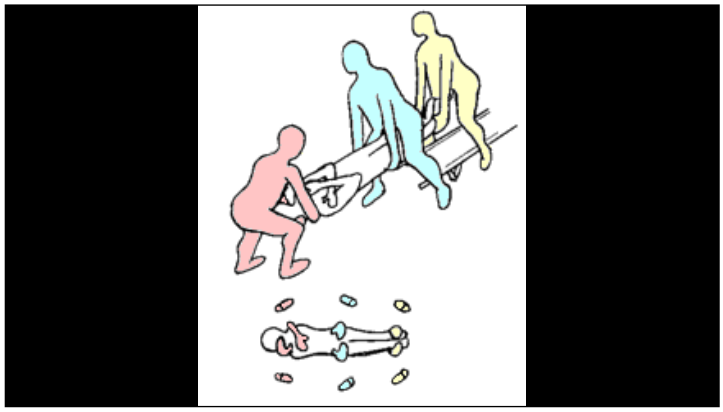
Risks of log-rolling: Promoting haemostasis in the trauma patient is a vital step… Never use a log roll on a trauma patient, it can make bleeding from an open-book pelvic fracture worse and moves the spine too much.

For the medicalese/legalese of these articles, I will have at least a selection of the recommendation in blue and then a plain-English translation in yellow.



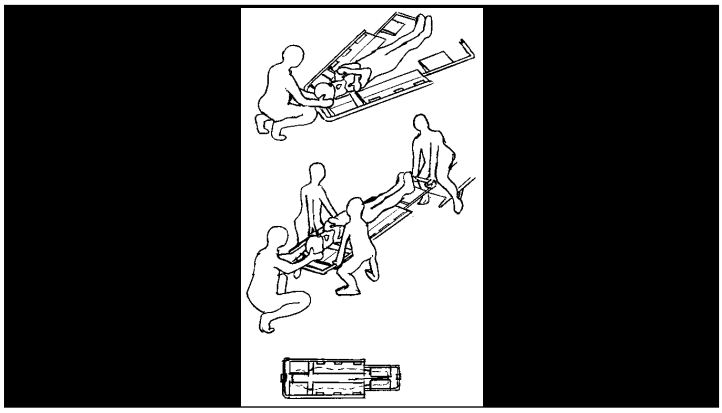
BEAM method (vertical lift, many-hands technique)

The long spinal board is an extrication device and should no longer be used for providing spinal immobilisation during transport to definitive care Never strap anyone to a backboard.

Backboard and rigid cervical collar. Licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license via Wikimedia Commons, courtesy Alexisrael.

The scoop stretcher should be used for patient transfer and to provide spinal immobilisation. Use an orthopedic scoop stretcher if you need to protect the spine.

Scoop Stretcher



Applying a Scoop Stretcher

When the total time immobilised on a scoop stretcher is likely to exceed 45 min, consideration should be given to using a vacuum mattress. Unless someone's going to be on it for a **total** of more than 45 minutes, in which case use a vacuum mattress instead.

Vacuum Mattress

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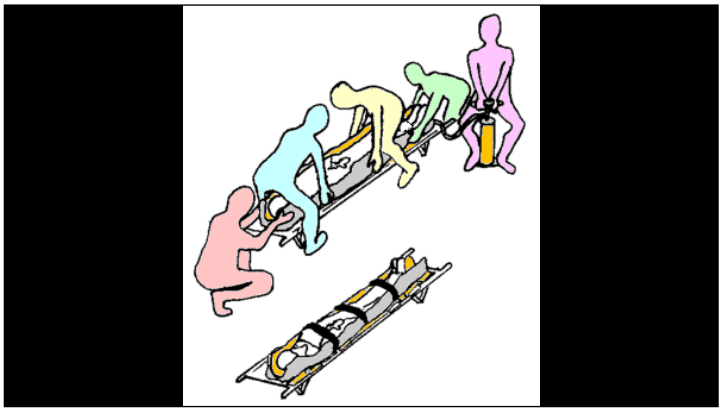

Applying a Vacuum Mattress

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WILDERNESS MEDICAL SOCIETY CLINICAL PRACTICE GUIDELINES

Wilderness Medical Society Clinical Practice Guidelines for Spinal Cord Protection

Seth C. Hawkins, MD [1]; Jason Williams, BS, NRP, DiMM [2]; Brad L. Bennett, PhD [3]; Arthur Islas, MD [4]; Dietrich Whitfield Kayser, MD [5]; Robert Quinn, MD [3]

[1]Department of Emergency Medicine, Wake Forest University, Winston-Salem, NC; [2]Department of Emergency Medicine, University of New Mexico, Albuquerque, NM; [3]Military & Emergency Medicine Department, Uniformed Services University of the Health Sciences, Bethesda, MD; [4]Department of Family and Community Medicine, University of Nevada, Reno School of Medicine, Reno, NV; [5]Department of Orthopaedic Surgery, University of Texas Health Science Center, San Antonio, TX

The Wilderness Medical Society reconvened an expert panel to update best practice guidelines for spinal cord protection during trauma management. This panel, with membership updated in 2018, was charged with the development of evidence-based guidelines for management of the injured or potentially injured spine in wilderness environments. Recommendations are made regarding several parameters related to spinal cord protection. These recommendations are graded based on the quality of supporting evidence and balance the benefits and risks/burdens for each parameter according to the methodology stipulated by the American College of Chest Physicians. Key recommendations include the concept that interventions should be goal oriented (spinal cord/column protection in the context of overall patient and provider safety) rather than technique oriented (immobilization). This evidence-based, goal-oriented approach does not support the immobilization of suspected spinal injuries via rigid collars or backboards.

Keywords: spinal injury, spinal immobilization, cervical spine injury, cervical spine immobilization, spinal motion restriction

2019

Introduction

unlikely to be justified in the nonwilderness environment. In wilderness environments, any decision to immobilize a

In 2019, Seth Hawkins, who was one of our emergency medicine residents at the University of Pittsburgh, coordinate this landmark paper: the Wilderness Medical Society guidelines for spinal cord protection.

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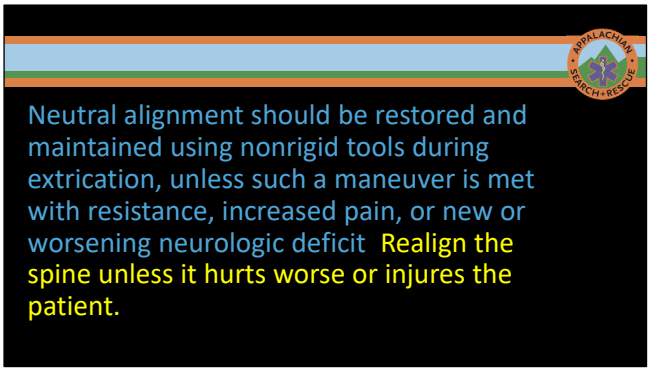


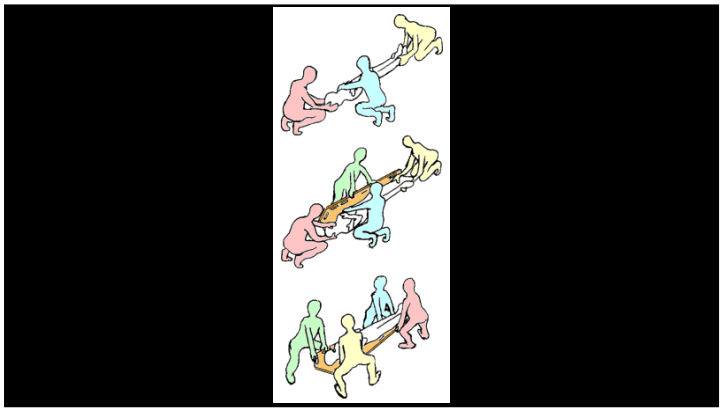
Patients requiring extrication should be encouraged to reduce movement of the neck, especially painful movement, and allowed to exit the situation under their own volition if alert and reliable "Don't move your head or neck." "Can you get out by yourself?"

If injuries or other circumstances such as unconsciousness prevent controlled self-extrication, patients' cervical spines should be packaged to reduce passive motion and the airway adequately managed without a goal of absolute immobilization. Make sure the neck doesn't get injured more, but don't immobilize.

There is no requisite role for commercially made or improvised rigid cervical collars in an out-of-hospital environment. You don't have to use a cervical collar.

The lift and slide transfer with trap squeeze is preferred to the log-roll when transferring patients when motion restriction is desired BEAM (Body Elevation and Movement) is better than a log-roll.

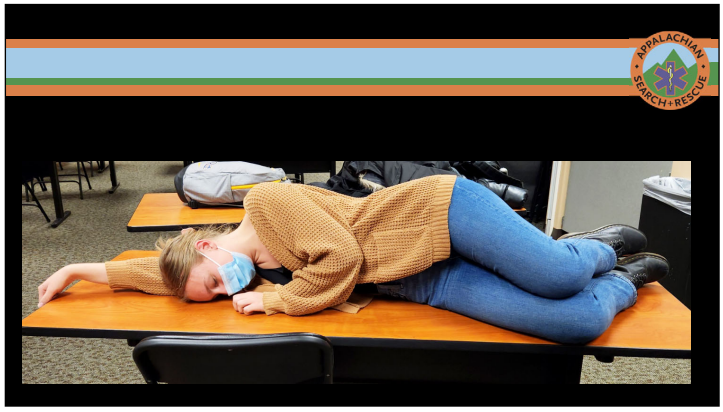
BEAM: Body Elevation and Movement. This clearly was invented by a trekkie: "Beam me up, Scotty!" I've been teaching this for 50 years, and always called it the "many hands" technique. Get a bunch of people together, put hands under the patient, lift the patient and slide the litter underneath.



Log Roll: Now Deprecated, doesn't protect the spine as well as BEAM, and is bad for open-book pelvic fractures.

In the case of facial fractures, an unconscious patient, or other scenarios concerning for airway compromise, the lateral position may be considered Coma position is OK even if ? spinal injury.

Coma Position (Recovery Position): vomit drains out instead of into the lungs.



A first-year medical student and EMT-Advanced showed another variant of a coma position at an airway management session for medical students I was teaching last week.

Light to moderate traction should be used when

When you realign the neck, keep a bit of traction on it

Spinal cord protection should be considered an appropriate goal in patients with actual or suspected spinal injury; current evidence suggests spinal motion restriction and not immobilization is the safest and most effective means of spinal cord protection No "immobilization." Just "protection."

Commercial or improvised soft cervical collars should be considered one of several tools available to aid in reducing cervical spine motion, if that is a desired goal. Maybe a *soft* collar?

[A cervical collar] should not be used if the presence of the collar in itself compromises emergent patient care Putting a C-collar on a patient is not a big priority.

If the medical history is known, use of any rigid cervical collar is contraindicated in ankylosing spondylitis. Anklyosing spondylitis + rigid collar = cervical spine fracture. Don't do it.

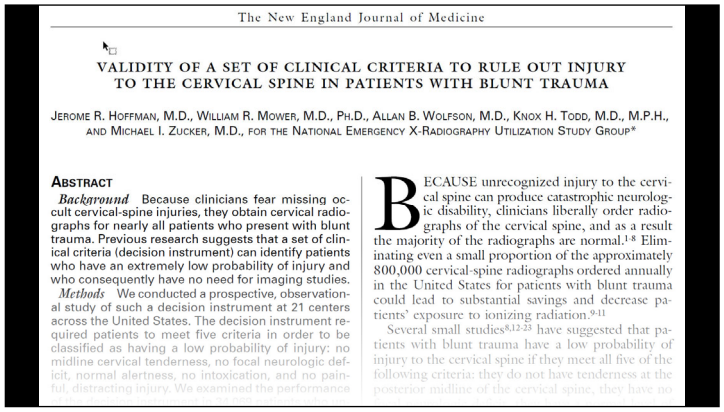
Patients with suspected injury should have their neck supported in a position of comfort. "Would you like something for a pillow under your neck?" (Pad voids.)

[A] vacuum mattress provides superior motion restriction and improved patient comfort (with corresponding decreased risk of pressure sores) and is preferred over a backboard for motion restriction of either the entire spine or specific segments of concern. Vacuum mattress yes, backboard no.

Backboards and other rigid carrying devices may be used for temporary patient movement if needed but should not be applied as a medical tool with an immobilization goal. Never strap a patient to a backboard.

If spinal cord protection is desired, appropriately trained personnel, using either the NEXUS criteria or the Canadian C-spine rule, can safely and effectively make decisions in the prehospital setting regarding whether cervical spine motion should be reduced You, too, can "clear the C-spine."

The Canadian C-spine criteria are so complex and hard to remember that pretty much everyone prefers the NEXUS criteria.



The New England Journal of Medicine

VALIDITY OF A SET OF CLINICAL CRITERIA TO RULE OUT INJURY TO THE CERVICAL SPINE IN PATIENTS WITH BLUNT TRAUMA

JEROME R. HOFFMAN, M.D., WILLIAM R. MOWER, M.D., PH.D., ALLAN B. WOLFSON, M.D., KNOX H. TODD, M.D., M.P.H., AND MICHAEL I. ZUCKER, M.D., FOR THE NATIONAL EMERGENCY X-RADIOGRAPHY UTILIZATION STUDY GROUP*

ABSTRACT

Background Because clinicians fear missing occult cervical-spine injuries, they obtain cervical radiographs for nearly all patients who present with blunt trauma. Previous research suggests that a set of clinical criteria (decision instrument) can identify patients who have an extremely low probability of injury and who consequently have no need for imaging studies.

Methods We conducted a prospective, observational study of such a decision instrument at 21 centers across the United States. The decision instrument required patients to meet five criteria in order to be classified as having a low probability of injury: no midline cervical tenderness, no focal neurologic deficit, normal alertness, no intoxication, and no painful, distracting injury. We examined the performance

BECAUSE unrecognized injury to the cervical spine can produce catastrophic neurologic disability, clinicians liberally order radiographs of the cervical spine, and as a result the majority of the radiographs are normal.[1-8] Eliminating even a small proportion of the approximately 800,000 cervical-spine radiographs ordered annually in the United States for patients with blunt trauma could lead to substantial savings and decrease patients' exposure to ionizing radiation.[9-11]

Several small studies[8,12-23] have suggested that patients with blunt trauma have a low probability of injury to the cervical spine if they meet all five of the following criteria: they do not have tenderness at the posterior midline of the cervical spine, they have no

The fact that one of my long-time partners, Abby Wolfson, was a principal author and I was involved in the study has nothing whatsoever to do with this. Really.

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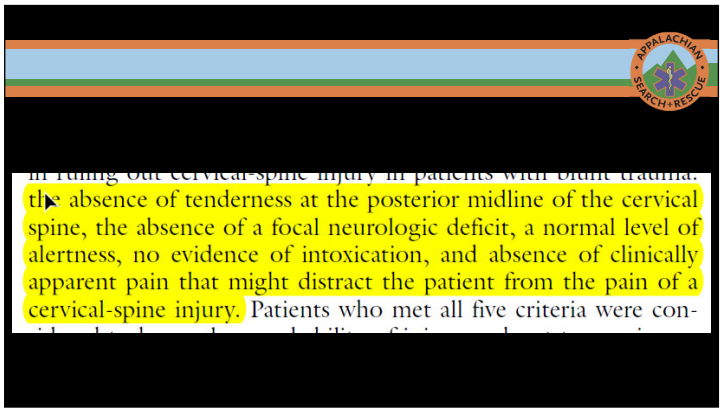
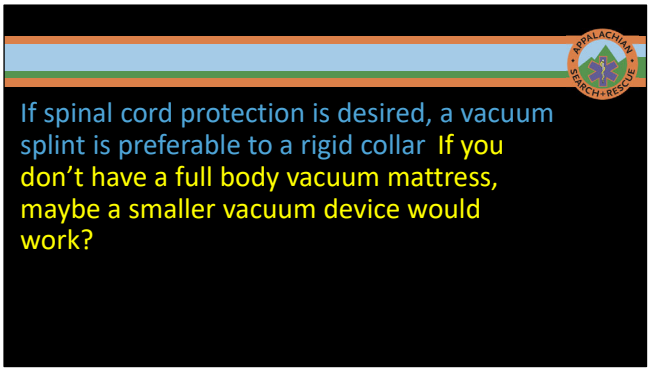


in ruling out cervical-spine injury in patients with blunt trauma: the absence of tenderness at the posterior midline of the cervical spine, the absence of a focal neurologic deficit, a normal level of alertness, no evidence of intoxication, and absence of clinically apparent pain that might distract the patient from the pain of a cervical-spine injury. Patients who met all five criteria were con-

The criteria are these words, as interpreted by an emergency physician. If you change the words, it's not the NEXUS criteria. But there is no reason that any clinician… an APP, a nurse, or a paramedic… shouldn't be able to interpret these words the same way. (Everyone wants to include more details for their "NEXUS-equivalent" criteria. Nope, those are not the same.)



There are vacuum-mattress "half backboards" which can also do things like splint a femur fracture.

Spinal immobilization should not be performed for isolated penetrating trauma.
Duh.

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