Procedure 712: Spinal Immobilization

Revision 5/22/18
Effective 8/1/18

- Purpose:
  - To provide guidelines and recommendations for the spinal immobilization of prehospital patients in Santa Cruz County.
- Core Principles
  - The incidence of true spinal cord injuries from both blunt and penetrating mechanisms is exceedingly low and occurs less than 1-2 % of the time. The incidence of clinically significant spinal cord injuries, without neurologic symptoms, is exceedingly rare. The best candidates for full head-to-toe immobilization are victims of high impact mechanism with multi-systems injuries.
  - Most spinal injuries, of any consequence, present with spinal pain and vertebral tenderness on palpation. Alert and oriented patients with true spinal injuries, tend to exhibit pain and tenderness to palpation, and generally vigorously self-splint. Substantial spinal injuries are best recognized through diligent physical exams. In general, ambulatory patients do not have serious thoraco-lumbar injuries. Patients who have an altered level of conscious, are intoxicated, or have painful distracting injuries, such as a long bone fracture, may not reliably report the presence pain or tenderness on the spine.
  - Mechanism of injury without subjective complaints or objective findings of spinal injury is generally a poor predictor of injury. Mechanism of injury should be more carefully considered in high-risk patients (elderly and children) and in those patients for whom an accurate history and physical examination cannot be obtained. Elderly patients, and those with preexisting arthritis and other diseases which compromise their skeletal system, are more likely to have spinal injuries after a traumatic mechanism. These patients should be more conservatively managed, and there should be a greater suspicion for occult – hidden – spinal injuries, especially in those patients with chronic confusion/dementia. In discriminate and inappropriate spinal immobilization can cause harm.
  - Spinal immobilization should reduce, rather than increase, patient discomfort. Immobilization that increases pain should be avoided. Full spinal immobilization, as traditionally practiced, has often caused more injuries than it has prevented. Spinal immobilization can be painful and can induce pressure sores. Often needless radiologic studies are undertaken only to identify, what is in fact, provider induced pain.
  - The goal of immobilization is to prevent further spinal injury during patient extrication, treatment, and transport. Patients with suspected spinal injuries should be maintained in, what is for them, a “neutral”, in-line position. This position will vary from patient to patient depending on the presence of arthritis or other spinal abnormalities. A patient’s cervical spine should never be moved if movement increases pain, neurologic deficits, or neck spasm.
  - Immobilization should be accomplished using the most appropriate tools for the specific circumstance. The EMS spinal immobilization tool box may include tape, vacuum splints, pneumatic splints, stiff cervical collars, soft collars, short boards or KEDs, long boards, straps, head immobilization devices (“headbeds”, etc.), as well as soft materials such as pillows and pull sheets.

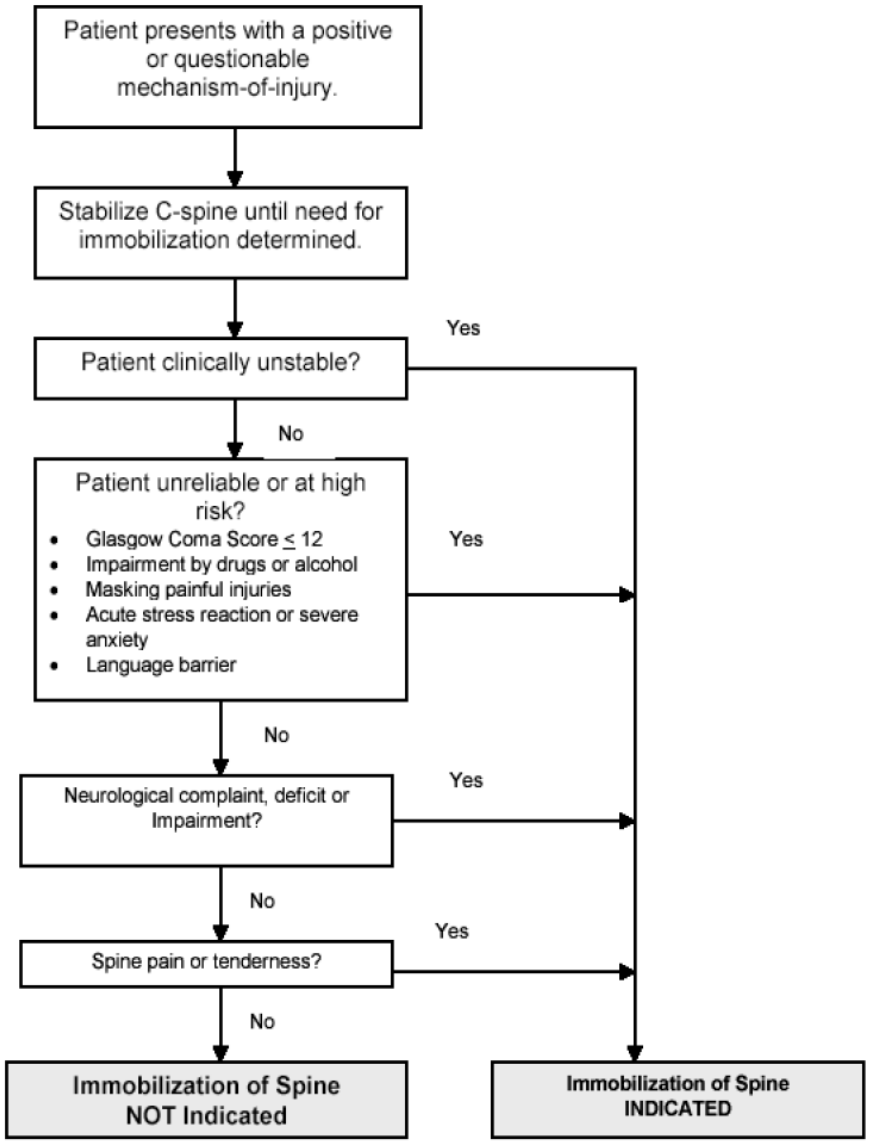
- The County endorses equipment, which allows for the comfortable immobilization of patients wherein further harm is not induced. Equipment choices should abide by the "form follows function" axiom.
- Ill-fitting equipment is worse than no equipment at all. For example, more harm may be caused by a cervical collar that hyperextends a patient's injured cervical spine than by omitting a collar altogether.
- Appropriate spinal immobilization depends on an accurate history and physical exam of the spine.
- Spinal immobilization should not be utilized to simply extricate or move a patient.
- There is no evidence that supine immobilization of the spine is any better than placing a patient in semi-fowler's position. It is also clearly less comfortable.
- Full spinal immobilization of penetrating thoracic trauma patients increases mortality and morbidity. Alert, neurologically intact victims of penetrating thoracic trauma without spinal pain do not require spinal immobilization.
- If there is any doubt during the evaluation of a patient's spine, it is always better to immobilize the patient while deferring further spinal evaluation to the ED staff.

❖ Immobilization Guidelines

- Backboards must be appropriately padded to prevent pain and pressure sores. Patients for whom the use of a long board is not necessary include those with ALL the following:
  - Normal level of consciousness (GCS=15)
  - No spine tenderness or anatomic abnormality
  - No neurologic findings or complaints (numbness, weakness)
  - No distracting injury
  - No intoxication
- Partial immobilization of a patient with isolated neck pain is acceptable and encouraged. This may include a stiff or soft collar, use of cervical and thoracic vacuum splinting, pillows, the KED, etc. Patients with isolated cervical pain may be sat up in a semi- or high fowler's position. Patients who are laid supine will be substantially more comfortable with their knees elevated.
- Full spinal immobilization (BB, headbed, collar, straps and tape) should be reserved, primarily for patients who have received a high impact with resulting multiple systems blunt trauma, and/or who are unable to provide accurate information to field responders. This level of immobilization is more comfortable if vacuum splinting is utilized.
- Pull sheets, other flexible devices, and concave "scoops" should be employed for moving patients whenever possible; backboards should be used only if these other devices are unavailable.
- Spinal movement and discomfort are reduced by allowing patients to self-extricate, when possible, and to place themselves onto gurneys and spinal immobilization devices. Back-boarding patients from a standing position is discouraged.
- Patients who truly require immobilization should be placed in equipment, which allows for a relatively comfortable maintenance of a neutral position. This can be accomplished with stiff neck or soft foam collars, partial immobilization only of the cervical spine, use of devices such as the KED or vacuum splint technologies, and positioning to include supine, semi-fowlers, and/or high fowlers positions.
- Logrolling a patient is very uncomfortable and leads to increased spinal movement. The preferred technique to getting patients onto backboards is to "forklift" the patient onto the backboard.

- Responders should document all history and exam findings on the Prehospital Care Report. The patient's neurologic status (pre- and post-immobilization), along with all spinal immobilization interventions, should also be documented.
- Spinal immobilization may be withheld in patients without neck or spinal pain, tenderness, ALOC, intoxication or distracting injury, if the patient can be accurately evaluated. Figure 1 will be utilized when deciding whether to immobilize a patient's spine
- The spinal immobilization of all patients in protective gear (football/lacrosse players, motorcycle riders, law enforcement personnel in ballistic protection/riot gear, etc.) should be completed after all protective gear has been removed on scene.
  - In general, prehospital responders, in conjunction with on-scene trainers, coaches, and law enforcement personnel, are more familiar with removing protective gear than emergency department staff, and have the space, equipment, and personnel resources to perform this safely and expeditiously.
  - Careful, coordinated, manual technique should be employed when removing protective gear and placing the patient in the appropriate immobilization equipment.
  - On-scene removal of protective gear can be deferred if removal on scene would hamper timely transport of the patient to the appropriate receiving facility. In this case, the patient's spine should be protected in a neutral position, with special care taken to compensate for the neck flexion typically caused by helmets. In no instance should a helmet hamper the ability of responders to manage the patient's airway or breathing requirements.

Spinal Immobilization Decision Algorithm



Patients at Higher Risk for Spinal Injuries
Maintain a higher index of suspicion
Child ≤ 8 years, Elderly ≥ 70 years
History of serious spine problems