

SPINAL MOTION RESTRICTION (SMR)

Indication

- Any patient identified by Marin County's Spinal Injury Assessment (GPC 13a) to warrant full or modified SMR. The spinal injury assessment should be performed prior to application of SMR. SMR describes the procedure used to care for patients with possible unstable spinal injuries

Full SMR

(Cervical collar with full-length vacuum spring or rigid device with lateral immobilization and straps)

- Indications:
 - Patients with obvious acute neurologic deficit (paralysis or weakness)
 - Priapism or suspected spinal shock
- Procedure:
 - **Assess motor/sensory function before and after SMR application**
 - regularly reassess and document motor/sensory function (include finger abduction, wrist/finger extension, plantar/dorsal flexion and sharp/dull exam if possible) following application of SMR
 - **Remove athletic equipment (if applicable)**
 - **Apply rigid cervical collar**
 - Cervical collar may be omitted for patients with isolated lumbar and/or lower thoracic spine tenderness
 - If needed, **extricate patient** limiting movement of the spine
 - **Apply adequate padding** on backboards or use vacuum mattress to prevent tissue ischemia and increase comfort
 - Secure patient to device
 - **Consider the use of SpO2 and EtCO2** to monitor respiratory function

Modified SMR

(May include any of the following: rigid cervical collar alone; self limiting motion; padding to limit movement; KED; or 1/2 length vacuum splint)

- Indications:
 - Patients who do not meet criteria for full SMR, but who are at high risk due to blunt trauma mechanism
 - Ambulatory/self-extricated patients who have mid-line neck pain and/or tenderness
- Procedure:
 - **Use the least invasive methods/tools available** which minimize patient discomfort and respiratory compromise
 - Least invasive examples: Lateral, semi-fowler's or fowler's position with cervical collar only; pillows; vacuum splint or gurney mattress; child's car seat
 - **Hard backboards should only be used when absolutely necessary** (e.g. patient transfer)
 - Consider pull sheets, other flexible devices (e.g. flat stretchers), or scoops and scoop-like devices
 - **Provide manual stabilization** restricting gross motion.
 - **Alert and cooperative patients** may be allowed to self-limit motion if appropriate with or without cervical collar
 - **Self-extrication** is allowable for patients meeting criteria for modified SMR

SPECIAL CONSIDERATIONS

- Full SMR is not benign; it can lead to pain, respiratory compromise, skin breakdown and contribute to cerebral hypoperfusion in patients with stroke or head injury
- **Routine use of SMR should be avoided.** Its use should be reserved for patients with confirmatory physical findings or high clinical suspicion of unstable spinal fracture
- **SMR is not indicated in patients with isolated penetrating trauma**
- Use SMR with caution with patients presenting with **dyspnea** and position appropriately
- If patient experiences negative effects of SMR methods used, alternative measures should be implemented as soon as possible
- **Pregnant patients >20 weeks:** should be positioned on the left side, immobilized as appropriate, supporting fetus
- **Combative patients:** Avoid methods that provoke increased spinal movement and/or combativeness
- **Athletic Equipment:** (football helmet and shoulder pads; lacrosse helmet and shoulder pads; baseball/softball helmet)
 - In event of suspected spine injury during participation in equipment-intensive sport, removal of equipment is strongly recommended prior to application of SMR
 - Equipment should be removed by the rescuers most familiar with the equipment (I.e. Athletic Trainers when present)
 - Removal of helmet and/or shoulder pads provides early access to the patient's airway/chest
- **Pediatric patients**
 - Consider the use of SpO₂ and EtCO₂ to monitor respiratory function
 - Consider use of padded pediatric motion restricting board
 - Avoid methods that provoke increased spinal movement
 - Unless secured to backboard, pediatric patients shall be transported in a child restraint system (CRS)