

Medical Control Guideline: SPINAL MOTION RESTRICTION

DEFINITION: Spinal Motion Restriction (SMR) describes the procedure used to care for patients with possible unstable spinal injuries. SMR includes: Reduction of gross movement by the patient; prevention of additional damage to the spine; and regular reassessment of motor/sensory function.

PRINCIPLES:

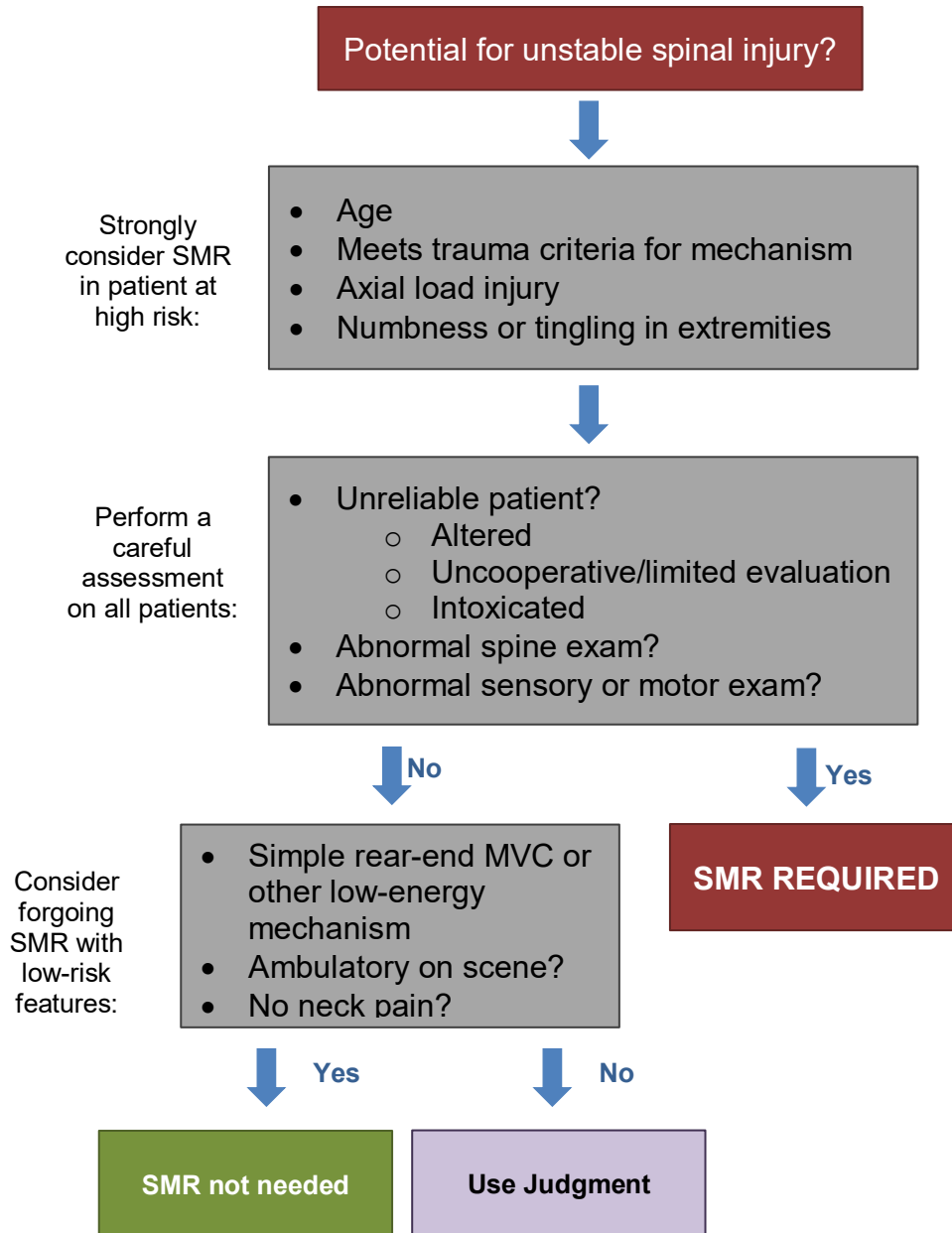
1. SMR involves maintaining a neutral in-line position of the spine at all times during patient treatment and transport. SMR requires the patient's head, neck and torso to be appropriately stabilized. This can be achieved manually or with the use of commercially available equipment.
2. There are multiple commercial devices that may be used to assist with SMR during patient movement. In addition, there are harmful side effects of these devices that must be considered.
3. Prehospital provider assessment will determine if SMR should be initiated.
4. Prehospital providers should use judgment and consider SMR for patients without neurologic findings, but in whom one is still concerned for unstable spinal injury.
5. A cervical collar alone does not provide adequate SMR. To provide appropriate SMR, the patient must be maintained in a neutral in-line position during movement and while on the gurney. Patients with potential thoracolumbar injury should be supine or reverse Trendelenburg.
6. The backboard is an extrication device. It may also be used to provide splinting during movement of patients with multiple traumatic injuries. While a backboard may be used to assist with SMR during the extrication phase, it is not required for SMR.
7. Once the patient is on the ambulance gurney, the backboard does not provide any advantage and may cause harm related to increased pain, increased lateral movement, and increased imaging at the hospital.
8. The backboard should not be maintained during transport for the purposes of SMR. Whenever possible, patients should be rolled off the backboard prior to transport. Exceptions include patients who are hemodynamically unstable or when there are scene safety concerns.
9. A backboard should not be used in the ambulatory patient (i.e., a patient who is standing and/or walking at the time of EMS arrival).
10. SMR is generally not indicated for penetrating injuries and transport must not be delayed to maintain SMR. Treatment of patients with penetrating trauma should not involve a backboard unless it is required as an extrication device.
11. Safe and proper removal of the helmet should be done by two people following steps outlined in an approved trauma curriculum.

12. Paramedic assessment, in accordance with guidelines below, will determine whether SMR is required. Whenever BLS has initiated SMR, paramedics should strongly consider maintaining c-collar and spinal precautions until hospital evaluation. Once SMR has been determined necessary based upon paramedic assessment, it should be maintained throughout the prehospital phase of care by whatever methods the provider deems appropriate. This does not include continuation of the backboard, which, if used to assist during extrication, should be removed once patient is on gurney.
13. The method by which SMR is maintained and devices used may be adjusted to meet the needs of the patient. In particular, management of the patient's airway may necessitate alternate SMR methods and should take precedence.
14. For purposes of the assessment, an unreliable patient is anyone who is altered, intoxicated or nonverbal. Limited evaluation may be due to communication barrier, uncooperative patient or patient too distracted by other injuries and circumstances. An abnormal spine exam is any deformity or tenderness along the spine.
15. For the purposes of the pediatric assessment, an abnormal torso exam refers to evidence of substantial torso injury, defined as injuries thought to be potentially life threatening to the thorax including the chest wall, abdomen, flanks, back and pelvis with an unstable chest wall, abdominal distension or significant chest or abdominal tenderness.

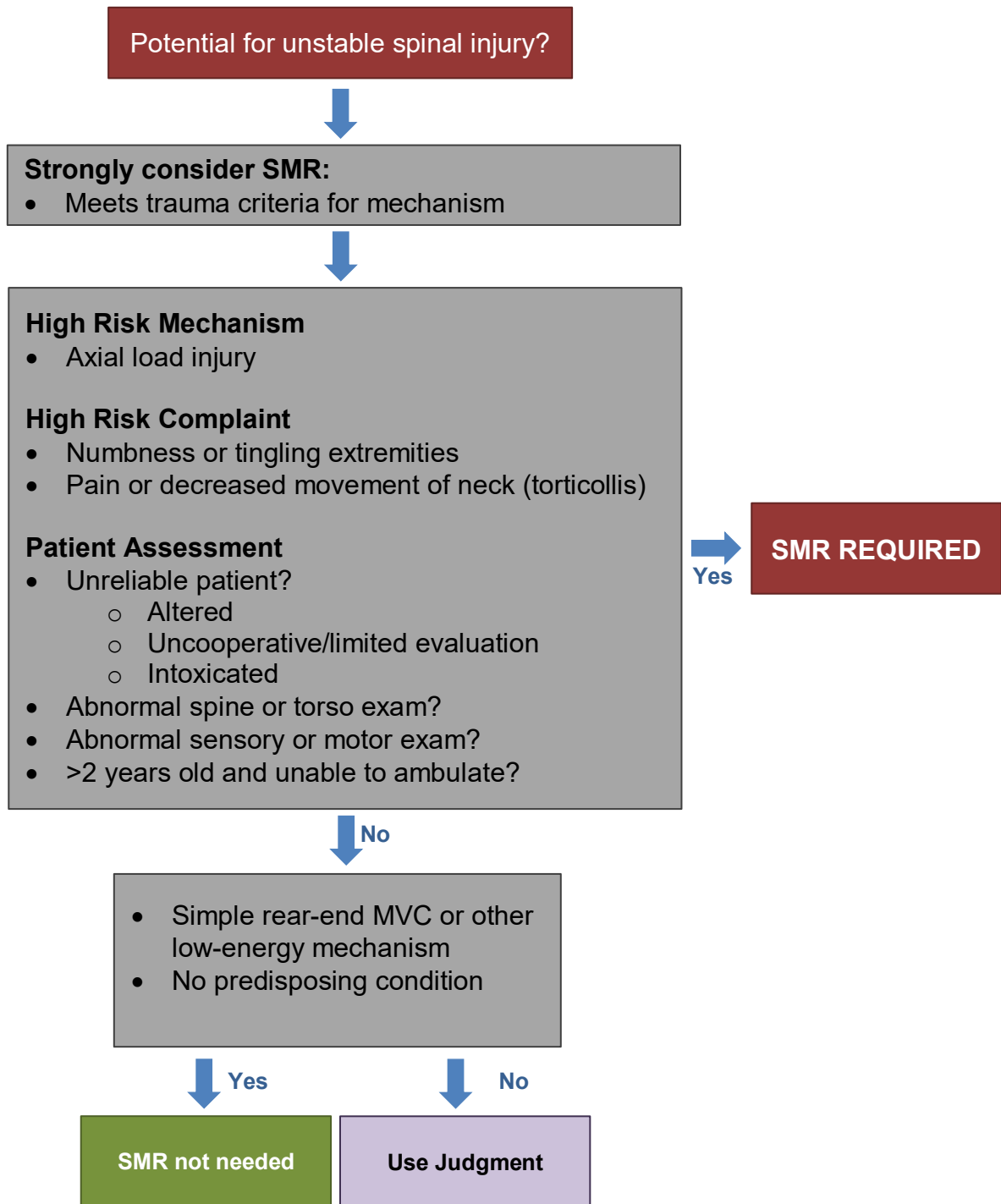
GUIDELINES:

1. Every patient with trauma, including ambulatory patients, must receive an assessment. If any assessment component is positive, the patient requires SMR. (See age-appropriate SMR algorithm.)
2. Patients initially placed in SMR by BLS providers whose care is transferred to ALS providers, shall receive a paramedic assessment to determine if continuation of SMR is indicated.
3. Neurological examination includes:
 - a. Test of sensation and abnormal sensation (parasthesias) in all 4 extremities
 - b. Test of motor skills in all 4 extremities with active movements by the patient (avoid just reflexive movements like hand grasp) to include: wrist/finger extension and flexion, foot plantar and dorsiflexion
 - c. Frequent reassessment.
4. All history and examinations pertinent to the decision for SMR, as outlined in the adult and pediatric algorithms, must be assessed and documented on the EMS Report Form or ePCR.
5. Padding may be necessary to maintain neutral alignment particularly in children <3 years old who have a large occiput forcing the head forward when supine.
6. Infants in rear facing car seats may be immobilized and extricated in the car seat as long as the patient is stable and does not exhibit signs of respiratory distress or shock.
7. Children restrained in a car seat with a high back should be extricated in the car seat and then be placed in SMR as appropriate. Children in booster seats (without a back) should be placed in SMR as appropriate.

ADULT ALGORITHM:



PEDIATRIC ALGORITHM:



Predisposing conditions are any of the following: Family members who fracture bones easily, child with spinal deformity, dysmorphic features, or childhood rheumatoid arthritis.

Specific conditions include: Down syndrome, hydrocephalus, dwarfism (achondrodysplasia), Klippel-Feil syndrome, mucopolysaccharidosis, Ehlers-Danlos syndrome, Marfan syndrome, osteogenesis imperfecta, Larsen syndrome, juvenile rheumatoid arthritis, juvenile ankylosing spondylitis, renal osteodystrophy, rickets, scoliosis, history of cervical spine injury /surgery.