

A3

SPLINTING and IMMOBILIZATION

EMS personnel routinely splint and immobilize patients to prevent or minimize secondary injury. All EMS personnel must be familiar with techniques for axial and extremity splinting and immobilization, with particular attention to indications and precautions with each procedure. EMS personnel should refer to specific treatment protocols regarding use of these techniques.

SPLINTING: AXIAL**Indications**

- pain, swelling, or deformity of spine which may be due to fracture, dislocation, or ligamentous instability
- neurologic deficit which might be due to spinal injury
- prevention of neurologic deficit or further deficit in patients with any suspected spinal injury or instability due to any mechanism
- in all trauma victims who are unconscious or with impaired consciousness due to head injury or drug ingestion, to protect against damage or further damage in patients

Precautions

- all patients with significant head trauma should be immobilized because of the potential for unrecognized coexistent neck trauma
- if at all possible, perform and document complete neurologic exam prior to movement
 - reassess and document after your splinting is complete

Cervical Splinting Technique

- perform cervical splinting following primary assessment if indicated
 - use partner to maintain cervical stabilization while completing primary survey
- use two persons to apply splint if at all possible
- do not use force to straighten
 - gently restore normal alignment
- advise patient of procedure and purpose before and during application
- immobilize the cervical spine with a semi-rigid collar of appropriate size
- use long or short spine board or orthopedic scoop to support patient as situation dictates
- use tape, straps, or both to secure patient effectively and allow turning as a unit for airway control
- continue to monitor airway and effectiveness of immobilization

Spinal Immobilization Technique

- primary survey
- secondary survey of head, neck and upper chest
- splint cervical spine with a rigid c-collar
- complete secondary survey and splint fractures prior to movement of patient when possible
- document neurologic findings
- in a sitting patient, use KED or short board for extrication
 - slide device behind patient
 - apply straps snugly
 - use padding as needed to keep neck (in cervical collar) in a neutral position
- secure head to device

- use long back board for spinal patients (or sitting patients) after KED or short board is applied
 - if the patient is unclothed or insufficiently clothed (e.g. pajamas, nightgown), then the board should be padded with a double layer of blanket or other suitable material. A patient should never be transported on a board with bare skin against an unpadded board
 - log roll or lift patient as a unit to board
 - one person should apply continuous cervical stabilization until patient is secured on device
 - do not use force to straighten spine
 - release leg straps if KED or short board was used
 - use padding as needed behind knees to support a neutral axis under small of back, neck and knees
 - apply straps or tape to secure chest, thighs, and lower legs and to allow turning as a unit in case of vomiting or airway difficulty
 - use towel rolls and tape (or head blocks or similar device) to secure head and neck immobilization

- reassess patient status, particularly airway and neurologic findings
- monitor airway and head and neck immobilization

Complications

- vomiting is common in head or spinal injury patients
 - your splinting must be good enough to allow turning of the patient as a unit for airway protection
- it is easy to miss injuries below the level of a neurological deficit
 - look carefully for abdominal and chest injuries, pelvic fractures, and extremity injuries without symptoms
 - with loss of sensation below T-8, there will be no guarding, rebound pain, or tenderness to clue you to internal abdominal injuries

Special Notes

- pelvic fractures are difficult to diagnose in the field
 - suspected pelvic injury can be immobilized by use of the long board or scoop during spinal immobilization with padding secured over the pelvis

SPLINTING: EXTREMITY

Indications

- pain, swelling, or deformity in extremity which may be due to fracture or dislocation

- in an unstable extremity injury: to reduce pain; limit bleeding at the site of injury; and prevent further injury to soft tissues, blood vessels or nerves

Precautions

- critically injured trauma victims should not be delayed in transport by lengthy evaluation of possible noncritical extremity injuries
 - prevention of further damage may be accomplished by securing the patient to a spine board when other injuries demand prompt hospital treatment
- the patient with altered level of consciousness from head injury or drug/alcohol influences should be carefully examined and conservatively treated, because his ability to recognize pain and injury is impaired
- make sure the obvious injury is also the only one
 - it is particularly easy to miss fractures proximal to the most visible one
- in a stable patient where no environmental hazard exists, splinting should be done prior to moving the patient.

Extremity Splinting Technique

- check pulse and sensation distally prior to movement or splinting
- remove bracelets, watches, or other constricting bands prior to splint application
- identify and dress open wounds
- to minimize pain and soft tissue damage, avoid sudden or unnecessary movement of fracture site
- stabilize the affected extremity in the position found
- reduce angulated fractures if no distal pulses are present
 - use gentle axial traction as needed to immobilize properly
- choose splint to immobilize joint above and below injury
 - pad rigid splints to prevent pressure injury to extremity
- check distal pulses and sensation after reduction splinting
 - if splinting results in loss of distal circulation or sensation, loosen splinting device

Possible Complications of Splinting

- circulatory compromise from excessive constriction of limb
- continued bleeding not visible under splint
- pressure damage to skin and nerves from inadequate padding
- delayed treatment of life-threatening injuries due to prolonged splinting procedures

Special Notes

- traction splints should only be used if the leg can be straightened easily and patient is comfortable with the traction device on
 - for injuries within 5 cm / 2 inches of a joint, forced application of traction device can cause increased pain and damage
 - if such an injury is present, do not use traction device
 - support in position of most comfort and best neurovascular status
- when in doubt and the patient is stable, splint
 - do not be deceived by absence of deformity or disability
 - fractured limbs often retain some ability to function
- splinting body parts together can be a very effective way of immobilizing: arm-to-trunk or leg-to-leg
 - padding will increase comfort
 - this method can be very useful in children when traction devices and pre-made splints do not fit
- joints must be immobilized and left in the position they are found
 - they are not to be manipulated or repositioned