

T4

FRACTURES and DISLOCATIONS

Musculoskeletal system trauma resulting in fractures or dislocations requires prompt and careful management. Strains, sprains, fractures, and dislocations are often difficult to differentiate. All strains, sprains, fractures, and dislocations should be immobilized and splinted prior to transport, unless other life threatening injuries require immediate attention.

GENERAL

- personal protective equipment should be utilized as appropriate
- body substance isolation techniques and equipment should be utilized as appropriate
- primary survey
- secondary survey
 - one member of the EMS team should stabilize the injured extremity above and below the injury site while the other member exposes and examines the injury site
 - an assessment of the limb's distal neurologic and vascular status should be done at this time
- provide supplemental oxygen based on the patient's presenting condition and vital signs
- consider load and go criteria
- document wound characteristics
 - open or closed
 - foreign body, object, or debris
 - distal circulation, color, and warmth
 - distal neurologic status
- obtain a pertinent history
 - injuries identified by patient
 - time of injury
 - mechanism of injury
 - past medical history
 - medications
 - allergies
 - last meal
- treat for shock, if indicated (see Shock Guideline)
- treat all wounds and injuries as per the appropriate Guideline
- do not allow the patient to exert him/herself - e.g. walking, standing unassisted to transfer to the stretcher, etc.

- initiate transport
 - on scene times should be kept to a minimum
 - handle the patient gently and carefully
- transport the patient to the nearest appropriate health care facility
 - notify the receiving facility of the patient's status
 - monitor and treat the patient en route
 - monitor distal circulatory and neurological status en route
 - be prepared to adjust the dressings and/or splints if status is compromised by the dressings and/or splints
 - transport patient in a position of comfort, injuries permitting
 - report all findings to the receiving facility staff, and document on the patient care report
- distal circulatory and neurological status must be reassessed after applying dressings and/or splints

Basic Fracture and Dislocation Management

- refer to Appendix 3
- EMS personnel should communicate with the patient at all times
 - inform the patient of actions and interventions that will be performed
- the primary objective of fracture and dislocation management is to support and prevent movement of injured areas of the body, and to prevent further injury due to movement of the injured area
- splint all injuries prior to moving the patient, except in load and go situations
 - in a load and go situation there may not be adequate time to provide complete splinting
 - initial attempts at splinting must be made to minimize movement of any injuries
 - this is particularly true if a fractured femur or pelvis is present or suspected
 - failure to splint a fractured femur or pelvis may result in excessive blood loss
 - splinting of injuries may need to be delayed while life saving interventions are initiated and continued
 - any delays in splinting, and the reasons for delay, should be documented on the patient care report
- clothing at or near the injury site should be removed
- jewelry distal to the injury should be removed and secured
 - disposition of valuables should be noted on the patient care report
- all wounds should be treated and dressed
 - bleeding from a wound at the injury site should be controlled without direct pressure immediately over the injury site
- manually stabilize above and below any fracture or suspected injury
- ensure that all splints utilized are adequately padded and applied firmly but not so tight that distal circulation is impaired
 - body hollows should be padded if possible
 - splint should not cover the suspected fracture or be secured tightly over the injury site
 - immobilize joint above and below fracture site
- hands and feet should be immobilized in the position of comfort

- secure the patient to an appropriate lifting or immobilization device and, if possible, elevate the injured extremity(ies)
- assess and record the circulatory and neurological status distal to the injury prior to and following treatment
- following any movement or treatment of the patient, the splinting should be reassessed
- transport the patient carefully to the nearest appropriate health care facility
 - a smooth, careful transport should be conducted
- record all observations and treatments and report this information to the medical staff at the receiving health care facility

Treatment of Fractures (excluding joints)

- fractures are splinted in the position found unless
 - limb is angulated in a manner that presents problems with transportation
 - distal pulse is absent
- if one of the above conditions is present
 - one (1) attempt is made to correct the problem
 - apply gentle in-line traction distal to the injury site in the direction the limb is lying and re-align the limb to its relative position. In-line traction must be maintained until the splint is secured
 - limb must be manually supported throughout the re-alignment
 - if resistance to the re-alignment is noted then the re-alignment must be stopped
 - limb must then be splinted in position
 - any changes to neurological or circulatory status must be documented
- load and go should be implemented if distal neurological and circulatory status is compromised

Joint Injuries

- immobilize and splint the injury in the position found
- load and go should be implemented if distal neurological and circulatory status is compromised

Cervical Spine Injuries

- refer to Central Nervous System Injuries Guideline

TRACTION SPLINTING (this technique is not within the scope of practice for EMRs)

- whether a pulley-style or ratchet-style traction device is utilized the same principles of splinting apply
- a traction splint should be used to immobilize fractures of the femur
- traction splinting is **contraindicated** if the injuries to the limb involve
 - injuries to the pelvis, hip, knee, lower leg or ankle joints and/or fracture is within 2 inches / 5 centimeters of a joint
 - basic splinting principals should be used in this setting

When Using a Pulley-Style or Ratchet-Style Traction Splint

- expose and manually stabilize limb above and below suspected fracture site
- treat wounds as indicated
- assess and record circulatory and neurological status distal to injury
- apply manual traction to injured leg by grasping ankle and calf and exerting a gentle pull in the line of the thigh
 - maintain a strong steady pull until the patient feels relief
 - traction must be judged so extension of the injured leg brings it only to the same length as the uninjured leg
- once relief is noted by the patient, the injured leg can be moved into the line of the body if no other injuries prevent this movement
- manual traction must be maintained until mechanical traction applied of equal value and secured
 - care must be taken so that traction is not lost during splint application
- measure and adjust the splint length against the uninjured leg and make all other preparations for applying it
- monitor the traction splint and reassess distal and neurological status during transport and after any movement of the patient

Pulley Style Traction Splint – Sager

- employ the basic principles outlined above
- ensure the patient is placed in a supine position
- measure (on the non-injured side) and adjust the splint to the proper length
- position the splint between the patient's legs
- apply the ischial strap at an angle towards the lateral hip joint and/or around the upper thigh (as high as possible) of the injured limb and secure the strap in place
 - place padding under the ischial strap if required
- apply ankle hitch ensuring the strap (sling) is proximal to the sole of the foot
- once the ankle hitch is in place
 - have your partner apply manual traction by grasping the strap (sling) of the ankle hitch and exerting a gentle pull in the line of the thigh. Connect hitch to splint and apply mechanical traction to equal manual traction
 - or
 - connect the ankle hitch to the traction splint and apply mechanical traction by extending the splint shaft to achieve the amount of traction desired, while observing the amount registered on the traction scale
- it is suggested to use 10% of the patient's body weight up to 7kg (15lbs) or until the patient feels relief
- secure the leg in the splint
- apply the Pedal Pinion (figure 8 strap) around the feet to prevent rotation
- reassess and record distal circulatory and neurological status
- prepare patient for transport

Ratchet-style Traction Splints

- employ the basic principles outlined above
- ensure the patient is placed in a supine position
- measure (on the non-injured side) and adjust the traction splint to the proper length
- apply ankle hitch ensuring the strap (sling) is proximal to the sole of the foot
- apply manual traction by grasping the strap (sling) of the ankle hitch and exerting a gently pull in the line of the thigh
- position the splint under the hip against the ischium and secure it in place with the ischial strap
 - leg may be gently elevated sufficiently for the splint to be applied

- alternately, the patient may be gently rolled to the uninjured side to allow the splint to be positioned
- lower the leg or roll the patient onto their back once the splint is in position
- place padding under the ischial strap if required
- attach the ankle hitch to the traction splint
- apply mechanical traction with no loss of manual traction until all of the manual traction is taken up
- it is suggested to use 10% of the patient's body weight up to 7kg (15lbs) or until the patient feels relief
- secure the leg in the splint
- reassess and record distal circulatory and neurological status
- prepare patient for transport

NOTE

- EMS personnel trained and certified in the use of nitrous oxide – oxygen mixture may do so to manage pain from fractures and dislocations, as outlined in the Nitrous Oxide – Oxygen (50:50 mixture) Protocol
- EMS personnel trained and certified in the use of morphine may do so to manage pain from fractures and dislocations, as outlined in the Morphine Administration Protocol
- Time of splint application must be noted on the PCR. EMS personnel need to be aware that traction splints should not be continuously applied for more than 12 hours. IF leaving the facility prior to removing a splint from the patient, EMS personnel should communicate the 12-hour maximum time to the receiving facility.

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