

T7

CHEST INJURIES

Patients suffering a chest injury may deteriorate rapidly. EMS personnel must assess the chest in the primary survey and initiate appropriate treatments immediately. Ongoing assessments must be done to identify any changes in the patient's condition.

GENERAL

- personal protective equipment should be utilized as appropriate
- body substance isolation techniques and equipment should be utilized as appropriate
- scene assessment
 - ensure continued safety
 - identify the mechanism(s) of injury
 - identify possible compression injury mechanism
- primary survey
 - assess for
 - agitation, restlessness, decreased level of consciousness
 - adequacy of respiratory effort and ventilation
- assess the chest, with attention to identifying immediate threats to life
 - open pneumothorax
 - tension pneumothorax
 - flail chest
 - impaled object
 - pericardial tamponade
 - any significant chest injury which could result in injury to the underlying structures
 - load and go should be initiated as soon as an immediate threat to life is identified
 - complete the primary survey while preparing to load and go or while en route
- if no immediate threat to life is identified, continue to assess the chest
 - symmetry of chest expansion
 - obvious trauma
 - bruising
 - swelling
 - bleeding
 - subcutaneous emphysema
 - deformity
 - open wounds
 - pain at injury site made worse by respiration
 - auscultate the chest for air entry (if within EMS personnel's scope of practice)
 - note any areas of decreased or absent air entry
 - do not remove objects impaled in chest unless they interfere with CPR

- secondary survey
 - may need to be conducted en route if the patient's status requires immediate transport
 - assess for
 - dyspnea
 - coughing up of frothy sputum or blood
 - swollen tongue or lips
 - distended veins in the face and eyes
 - tracheal deviation (note direction)
 - jugular venous distention (JVD)
 - subcutaneous emphysema
 - muffled heart sounds on auscultation (if within EMS personnel's scope of practice)
 - signs and symptoms of shock
 - treat other injuries as indicated, if patient's condition permits
 - monitor the patient's status closely
 - initiate load and go at any point during assessments if dictated by the patient's condition
- provide high concentration oxygen by non-rebreathe mask
 - assist ventilations as required
- treat for shock, if indicated
- 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
 - treat other life-threatening conditions en route
- transport the patient to the nearest appropriate health care facility
 - notify the receiving health care facility of the patient's status as soon as possible
 - monitor the patient's respiratory, cardiac and circulatory status en route
 - additional surveys and treatments should be conducted en route
- document all actions including the decision to initiate load and go
- report all findings to the receiving facility staff, and document on the patient care report

Special Considerations

- if the patient is able to maintain their airway and their ventilations are adequate then supplemental oxygen should be provided via non-rebreathe mask
 - if possible, the patient should be encouraged to take deep breaths
- if the patient has increasing respiratory distress, exhibits signs or symptoms of hypoxia, or has a decreasing level of consciousness, ventilations should be supported using 100% oxygen via bag-valve-mask
 - patients who are receiving positive pressure ventilatory support via a bag-valve-mask should be closely monitored for development of a pneumothorax
- if advanced life support (ALS) is available, EMS personnel should request early response of these personnel to the scene or consider an ALS intercept while en route
 - initiation of transport should not be delayed for ALS arrival
- complete the primary survey while preparing to load and go or while en route

Pneumothorax or Hemothorax

- spontaneous pneumothorax may occur with no history of trauma
- control any external bleeding
- provide high concentration oxygen and assist ventilations as required
- pain may result in the patient hypoventilating
 - if possible, encourage the patient to take deep breaths
- load and go should be initiated when a pneumothorax or hemothorax is recognized or suspected
- position patient in most comfortable semi-Fowlers position possible, supported towards injured side if tolerated and injuries permitting

Open Pneumothorax (sucking chest wound)

- cover the open wound with a gloved hand as a temporary measure
- without delay, apply an occlusive dressing
 - tape an occlusive dressing in place on three (3) sides so as to produce a one-way valve
 - air will escape from the chest but will not enter
- do not completely or permanently occlude the wound
 - dressing can be secured in place at any point during the respiratory cycle
 - ensure the dressing is large enough so it is not pulled into the wound during inspiration
- control any external bleeding
- load and go should be initiated when an open pneumothorax is recognized or suspected
- position patient in most comfortable semi-Fowlers position possible

- closely monitor the patient for development of a tension pneumothorax
 - if this develops, release the dressing
 - reassess breathing
 - if respirations return to normal, replace the occlusive dressing and secure it in place over the wound by taping it in place on three (3) sides so as to produce a one-way valve
- if tension pneumothorax conditions reoccur
 - remove the dressing completely
 - reassess breathing
 - monitor the patient closely
 - leave the dressing off of the wound

Impaled Object

- treat as outlined above
- if an impaled object is noted, assess for additional penetrating wounds or exit wounds
- leave an impaled object in place, and stabilize it to prevent movement of the object
 - if the object impedes transport then careful shortening (cut) of the object may be required
 - immobilize object securely during shortening effort
 - do not remove object unless it interferes with CPR
- load and go should be initiated when an impaled object is recognized or suspected
- position patient in most comfortable semi-Fowlers position possible
 - avoid putting any pressure on the impaled object

Flail Chest

- treat as outlined above
- identify any flail segments
- load and go should be initiated when a flail segment is recognized or suspected
- position patient in most comfortable semi-Fowlers position possible

Tension Pneumothorax

- suspect a tension pneumothorax in a patient presenting with the following signs or symptoms
 - hypotension
 - tachycardia
 - unilateral decreased or absent breath sounds
 - subcutaneous emphysema
 - tracheal deviation
 - jugular venous distention
- this is a major life threatening complication
- treat as outlined above
- needle decompression of the chest should be performed if it is within the EMS personnel's scope of practice and certified to do so
- load and go should be initiated when a tension pneumothorax is recognized or suspected
- position patient in most comfortable semi-Fowlers position possible

Compression Injury to the Chest

- consider multiple organ damage
- consider the possibility of pericardial tamponade, damage to the heart, great vessels, or the lungs
- treat as outlined above
- load and go should be initiated when a compression injury is recognized or suspected
- position patient in most comfortable semi-Fowlers position possible, supported towards injured side if tolerated and injuries permitting
- monitor en route for changes in status and the development of a tension pneumothorax

Pericardial Tamponade

- consider in the setting of chest injuries (blunt and penetrating) and compression injuries
- assess for
 - jugular venous distention
 - hypotension out of proportion to the blood lost
 - narrowed pulse pressure
 - cyanosis
 - dyspnea
 - increasing weakness
 - weakening pulse during inspiration
- treat as outlined above
- load and go should be initiated when a pericardial tamponade is recognized or suspected
- position patient in most comfortable semi-Fowlers position possible, supported towards injured side if tolerated and injuries permitting

Myocardial Contusion

- suspect myocardial contusion when the trauma patient presents with the following signs and symptoms
 - chest discomfort typical of a myocardial infarction that may be difficult to separate from musculoskeletal chest pain
 - palpitations
 - hypotension out of proportion to the blood lost
- load and go should be initiated when a myocardial contusion is recognized or suspected
- position patient in most comfortable semi-Fowlers position possible, supported towards injured side if tolerated and injuries permitting

NOTE

- recall that the obvious injury may not be the only injury
 - time and injuries permitting, always perform a complete primary and secondary survey
- injury to the chest results in significant pain
 - pain may prevent the patient from making an adequate respiratory effort
 - the patient should be encouraged to take deep breaths if possible
 - if the patient is not able to make adequate respiratory effort, ventilation should be assisted with a bag-valve-mask
- if a patient with a chest injury must also be immobilized, monitor the patient for the adequacy of their respiratory effort
 - encourage the patient to take deep breaths or assist ventilations
- an occlusive dressing is any dressing which provides an air tight seal
- all patients with a chest injury should be given high concentration oxygen
- consider injuries to underlying structures other than the lungs when a chest injury is identified
- do not wrap tape, tensor bandages, or similar devices around a patient's chest to control pain
- continuously monitor the patient for worsening respiratory effort and development of shock

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