Chest & Abdominal Trauma

Lesson Goal

- Identify common injuries to chest & abdomen and lifesaving initial interventions these injuries require

Lesson Objectives

- Identify patients at risk for significant chest or abdominal injuries based on MOI
- Recognize importance of obtaining appropriate vital signs and performing general physical assessment
Lesson Objectives

- Recognize signs and symptoms of shock in victims of chest and abdominal trauma
- Recognize patients who need high-priority transport and tiered response with advanced prehospital care

Lesson Objectives

- Describe how to bandage and protect open chest and abdominal injuries
- Describe how to make trauma patients more comfortable using nonpharmacologic means
- Describe how to recognize and preserve forensic evidence involved in penetrating trauma care

Introduction

- Serious injuries to chest & abdomen can quickly lead to death
- EMTs must:
  - Quickly recognize life-threatening conditions
  - Appropriately intervene
  - Provide for prompt transport to definitive care
Injury & Shock

- Chest & abdominal injuries—significant causes of trauma death

Causes
- Motor vehicle collisions
- Falls
- Assaults
- Penetrating trauma (stab & gunshot wounds)
- Blast trauma

Death from chest & abdominal injuries
- Hemorrhage
- Interference with ventilation & oxygenation

Injuries involve:
- Soft tissues
- Solid organs
- Hollow organs
- Direct trauma to heart & lungs

Bleeding from chest & abdominal trauma can be severe

Bleeding may be internal & not evident externally

Potential for blood loss & shock must be suspected based on MOI and recognition of early signs of shock
Injury & Shock

- Assessment for potential for chest & abdominal injury and shock begins with scene size-up
  - Number of patients
  - General impression of severity of injury
  - Safety of scene
  - MOI

Mechanism of Injury

- Different types of energy applied to body result in different injury patterns
- Assessing MOI is useful for discovering potential for injury to particular areas of the body

Mechanism of Injury

- Blunt
  - Direct impact
  - Rapid deceleration
  - Rapid acceleration
- Penetrating
  - Gunshot wounds
  - Stabbing
  - Impalement
Mechanism of Injury

- Lateral impact MVC injury patterns
  - Shoulder
  - Chest
  - Pelvis
  - Thigh
  - Neck
  - Side airbags reduce injuries

Mechanism of Injury

- Frontal impact MVC injuries
  - Anterior chest
  - Lower extremities
  - Abdomen
  - Neck

Mechanism of Injury

- Rollover MVC injuries
  - Multiple impacts/multiple injury potential
  - Ejection of unrestrained occupants
Mechanism of Injury

- Penetrating injury
  - Gunshot wounds
  - Stab wounds
  - Impalement

Never remove an impaled object

Stabilize object in place

Chest Injury
**Blunt Injuries**

- Chest wall contusions
- Fractured ribs
- Ruptured blood vessels associated with rib fracture
- Lung (pulmonary) contusions
- Tearing or rupture of lung tissue
- Cardiac contusion

**Blunt Injuries**

- Deceleration injuries
  - Aortic tear

**Blunt Injuries**

- Compression injury
  - Sudden compression of lungs during breath holding may cause rupture of lung tissue
  - “Paper bag” syndrome
Blunt Injuries

- Rib fractures & chest wall contusions
  - Sign of underlying injury
  - Pain interferes with breathing
  - Sharp bone ends may further damage tissue

- Pulmonary contusion
  - Blood from broken capillaries enters alveoli
  - Oxygenated air is prevented from reaching alveolar membrane for gas exchange
  - Contusion continues to worsen after initial injury, causing increasing impairment of oxygenation

- Pneumothorax
  - Pleural layers separated by air entering chest cavity outside lung
  - Air pressure partially or completely collapses lung
Blunt Injuries

- Open pneumothorax (sucking chest wound)
  - Cover open chest wound with occlusive dressing
    - Tape dressing on 3 sides to act as a one-way valve
      that lets air out, but not in

- Tension pneumothorax
  - Injury to lung does not seal
  - Air leak continues, ↑ pressure in thoracic cavity
  - All structures can be compressed, quickly resulting in death

- Hemothorax
  - Blood accumulates in chest, compressing lung
  - Each side of chest can hold a massive amount of blood
Blunt Injuries

- Myocardial contusion
  - Force of blow to chest can be transmitted to heart
  - Heart muscle is bruised
  - Damaged tissue acts like damaged tissue resulting from heart attack

- Aortic tear
  - Rapidly fatal
  - Occasionally patient survives to hospital
  - Immediate detection & surgical intervention required for survival

Penetrating Injuries

- Injury depends on velocity of weapon, its path, and other characteristics of weapon
- Injury extends beyond track of bullet because energy disperses into tissues
Chest Injury
- Shotgun blast

Chest Injury
- Multiple stab wounds

Chest Injury
- Because chest & abdomen are separated only by diaphragm, injury to one area may result in injury to adjacent area
Chest Injury: Assessment

- Assessment begins with general impression as you approach patient
  - LOC
  - General appearance
  - Ability to speak

Assessment: Chest Injury

- Unresponsive
  - Open & maintain airway

- Inadequate/absent breathing
  - Initiate ventilations

- Oxygen
  - Adequate breathing: nonrebreather mask
  - Inadequate breathing: bag-mask & supplemental O₂

Assessment: Chest Injury

- Expose chest
  - Bruises
  - Penetrating wounds
  - Tenderness/pain
  - Breath sounds

- Examine posterior & anterior
Assessment: Chest Injury

- Cover open chest wounds with occlusive dressing immediately
- Make decisions regarding transportation
  - ALS/BLS
  - Ground/air
  - Destination

Abdominal Injuries

- Abdominal injuries may not have immediate, distinct signs & symptoms
- Suspicion of abdominal injuries is developed based on assessment of MOI and systematic approach to assessment

Abdominal Injuries

- Solid organs
  - Liver
  - Spleen
  - Kidneys
  - Pancreas
  - Massive hemorrhage possible
- Hollow organs
  - Stomach
  - Intestines
  - Bladder
  - Contents spilled into abdominal cavity results in severe irritation and likelihood of infection
Abdominal Injuries: Assessment

- Signs of shock without significant external bleeding indicate possible hemorrhage into abdomen
- Assessment of abdomen—part of rapid trauma assessment

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Abdominal Injuries: Assessment

- Expose abdomen and inspect for:
  - Bruises
  - Penetrating wounds
  - Eviscerated organs
    - Cover with sterile nonadherent dressings moistened with sterile saline
  - Distention
- Absence of these signs does not rule out abdominal injury

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Abdominal Injuries: Assessment

- Gently palpate abdomen
Abdominal Trauma: Management

- Treat for shock, include high-flow O₂
- Transport without delay
- Consider whether transport destination has emergency surgery capabilities

Crime Scene Assessment

- Chest & abdominal injuries may occur in commission of crime
- Injured may be victims or perpetrators
- Assessing for scene safety is essential

Crime Scene Assessment

- Do not cut through clothing at point of entry of weapon
- Place clothing in paper, not plastic, bags
- Disturb scene as little as possible
- Do not begin resuscitative efforts if patient is obviously dead
Summary

• Chest & abdomen contain vital organs with abundant blood supply

• Injuries to organs can result in impaired ventilation & massive hemorrhage

• Patient with chest or abdominal trauma may require emergency surgery

Summary

• EMT’s role
  ➢ Consider:
    • MOI
    • Patient complaint
    • Physical examination findings
  ➢ Intervene in immediately life-threatening situations
  ➢ Treat for shock
  ➢ Make transport decisions appropriate to patient’s needs