Some of the most life-threatening injuries only to head trauma as leading cause of death post trauma have led to a reduction of mortality.

Behavioral Objectives:
- Identify the mechanisms of injury associated with thoracic trauma.
- Analyze the pathophysiologic changes as a basis for the signs and symptoms of thoracic trauma.
- Plan appropriate interventions for patients with thoracic injuries.
Rib Fractures

Etiology
- motor vehicle crash
- falls
- assaults

Concurrent Injuries
- 1st & 2nd rib
- clavicle
- scapula
- subclavian artery or vein
- aortic rupture

Diagnostic Indicators
- chest wall pain
- localized tenderness
- shallow respirations
- crepitus at site
- PA chest positive
Rib Fractures
Complications
 pneumothorax/hemothorax
 pneumomediastinum
 tension pneumothorax
 nonunion of fracture

Rib Fracture
Interventions
 pain management
 avoid rib binders

Flail Chest
Introduction
 fracture of two or more ribs on one side with a floating segment
 etiology = blunt trauma
Flail Chest
Signs & Symptoms
- tachypnea
- paradoxical chest movement
- crepitus on palpation
- pain
- hypoxia

Related Injuries
- pulmonary contusion
- pneumothorax
- pleural effusion
**Flail Chest Interventions**
- stabilize flail segment
- intubate & ventilate
- pain management
- prevent hypoxemia

**Pneumothorax**

**Introduction**
- accumulation of air in pleural space
collapse of lung
- etiology
  - blunt
  - penetrating
- most common chest injury

**Signs & Symptoms**
- dyspnea
- sudden onset pain
- hyperresonance
- diminished breath sounds
- possible tracheal shift
Pneumothorax Intervention
- chest tube insertion

Open Pneumothorax

Introduction
- free passage of air into and out of pleural space
- etiology = penetrating trauma

Signs & Symptoms
- dyspnea
- sucking sounds on inspiration
- penetrating chest wound
- diminished breath sounds
Open Pneumothorax
Interventions
 close defect
 surgical repair of defect

Tension Pneumothorax
Introduction
 air enters pleural space but cannot escape
 accumulation of air
 etiology = blunt or penetrating

Tension Pneumothorax
Signs & Symptoms
 severe dyspnea, chest pain
 distended neck veins
 tracheal deviation
 hyperresonance
 diminished/absent breath sounds
Tension Pneumothorax

Interventions

- chest decompression
- chest tube
- ? surgical repair

Tension Pneumothorax

Complications

- diminished cardiac output
- upper airway obstruction
- pneumomediastinum or subcutaneous emphysema

Hemothorax

Introduction

- accumulation of 1.5 - 4 liters of blood in pleural space
- etiology = blunt or penetrating
Hemothorax
Signs & Symptoms
- dyspnea/chest pain
- shock if > 1000 mL lost
- dullness
- diminished breath sounds
- possible mediastinal shift

Hemothorax
Interventions
- chest tube
- autotransfusion
- surgical repair

Hemothorax
Complications
- hypovolemic shock
- fibrosis
- empyema
Pulmonary Contusion

Introduction
- usually occurs after rapid deceleration
- bruising of lung
- etiology: blunt trauma or high-velocity missile

Signs & Symptoms
- dyspnea
- ineffective cough
- hyperpnea
- diminished pulmonary compliance
- increased airway pressure

Interventions
- oxygen
- mechanical ventilation
- diuretics
- fluid restriction
Pulmonary Contusion
- irreversible hypoxia and acidosis
- pleural effusion
- infection
- myocardial ischemia

Pericardial Tamponade
Introduction
- accumulation of blood in the pericardial sac
- etiology = blunt & penetrating trauma

Pericardial Tamponade
Signs & Symptoms
- dyspnea
- cyanosis
- Beck’s triad
- pulsus paradoxus
- shock symptoms
Pericardial Tamponade Interventions
- pericardiocentesis
- open thoracotomy
- operative intervention

Cardiac Contusion

Introduction
- bruising of the heart tissue
- myocardial ecchymoses to myocardial infarction
- etiology = blunt trauma

Signs & Symptoms
- chest pain similar to MI
- chest wall ecchymoses
- S3 or crackles in lung
- dysrhythmias, ECG changes
- elevated CPK, troponin
Cardiac Contusion

Interventions

- same treatment as for MI
- monitor CO & CV status
- monitor for life-threatening dysrhythmias for 24 - 48 hours

Cardiac Contusion

Complications

- cardiac tamponade
- cardiogenic shock
- myocardial rupture
- valve injuries
- constrictive pericarditis

Aortic Disruption

Introduction

- one of most lethal injuries
- most often deceleration injury
- 85 - 90% die before reaching hospital
**Chest Trauma**

**Aortic Disruption**

* Mechanism of Injury
  - transmediastinal gunshot wounds
  - deceleration
    - falls
    - motor vehicle
    - steering wheel

**Signs & Symptoms**

- pulse deficits
- hypotension
- unequal blood pressure
- hoarseness
- dyspnea/distress
Aortic Disruption
Non-operative Management
- observation
- stabilization
- fluids
- monitoring
Aortic Disruption
Operative Management
- left thoracotomy
- shunt bypass

Postoperative Care
- maintain BP @ 110 mm Hg
- correct coagulopathy
- replace blood loss
- monitor chest tubes
- manage other injuries

Postoperative Complications
- paraplegia
- renal failure
- ischemic bowel
- hypertension
- laryngeal nerve damage