Chapter 25 Thoracic Trauma

Chest Injuries (1 of 2)

• Directly responsible for more than ________% of all traumatic deaths (regardless of mechanism)
• Account for about 16,000 deaths per year in the United States
• Chest injuries are the __________________________ leading cause of trauma deaths each year.
• Most thoracic injuries (90% of blunt trauma and 70-85% of penetrating trauma) can be managed without __________________________.

Chest Injuries (2 of 2)

• Vital __________________________ are located in the chest
  ○ Heart, Great Vessels, Esophagus, Tracheobronchial Tree, & Lungs
• 25% of MVC deaths are due to thoracic trauma
  ○ __________________________ annually in US
• __________________________ injuries are common with chest trauma.

Classifications of Chest Injuries

• __________________________ injury
• Pulmonary injury
• __________________________ and great vessel injury
• Diaphragmatic injury
• __________________________

Classification of Mechanism of Injury

• __________________________ thoracic injuries
  – Forces distributed over a large area
  – __________________________
  – Compression
• __________________________ thoracic injuries
  – Forces are distributed over a small area.
  – Organs injured are usually those that lie along the path of the penetrating object

Injury Patterns

1
• __________________________
  • Pleural and pulmonary
  • Mediastinal
  • Diaphragmatic
  • Esophageal
2
• Penetrating cardiac trauma
  • __________________________ injury
  • Confined spaces
  • Shock wave
  • Thoracic __________________________
Anatomy of the Chest
- Skin
- Muscles
- Trachea
- Lungs
- Blood Vessels
  (area between the lungs)

Vascular Anatomy
- Aorta
- Carotid
- Subclavian
- Intercostal
  - Superior vena cava
  - Inferior vena cava
  - Subclavian
  - Internal jugular

Arteries
- Veins
  - Ventricles
  - Atria
  - Valves
  - Pericardium

Mediastinum Anatomy
- Trachea
- Vena cavae
- Pulmonary artery
- Esophagus
  nodes

Respiratory Physiology
- the mechanical process of moving air into and out of the lungs
- the exchange of oxygen and carbon dioxide between the outside atmosphere and the cells of the body

Impairments in Cardiac Output
• __________________________ loss
• Increased __________________________ pressures
• Blood in the pericardial sac
• Myocardial __________________________ damage
• Vascular disruption

12 □ Impairments in Gas Exchange
• __________________________ (collapse of the alveoli)
• __________________________ lung tissue
• Disruption of the respiratory tract
  – Pneumothorax, hemothorax, airway obstruction, etc

13 □ Assessment of the Neck
• Position of __________________________
• Subcutaneous emphysema
• Jugular venous distention
• __________________________ wounds

14 □ Assessment of the Chest
• Contusions
• Tenderness
• __________________________
• Lung sounds
  – Absent or decreased
    – __________________________
  – Bilateral
  – Location
  – __________________________ sounds in thorax

15 □ Abnormal Percussion Finding
• __________________________
  – Hollow sound
  – Signifies presence of air
• __________________________
  – “Full” sound
  – Indicates the presence of fluid

16 □ Blunt Thoracic Trauma (1 of 2)
  (Compression)
• Body is compressed between an object and a hard surface
• Direct injury of chest wall and __________________________ structures
• Deceleration
• Body in motion strikes a fixed object
• Blunt trauma to chest wall
• __________________________ structures continue in motion
• Ligamentum Arteriosum shears __________________________
17 **Blunt Thoracic Trauma (2 of 2)**

**Age Factors**
- Pediatric Thorax: More ____________________________ = Absorbs forces
- Geriatric Thorax: Calcification & osteoporosis = More

18 **Penetrating Trauma**

**Low Energy**
- Arrows, knives, ____________________________
- Injury caused by direct contact and cavitation

**High Energy**
- ____________________________, hunting rifles & high powered hand guns
- Extensive injury due to high pressure cavitation

19 **General Management of Penetrating Chest Trauma**

- Use ____________________________ dressings
- Never remove an ____________________________ object unless it interferes with CPR
- Monitor EKG for all chest trauma
- Be prepared for massive ____________________________
- IV’s to maintain BP

20 **Impaled Object (1 of 2)**

21 **Impaled Object (2 of 2)**

22 **Injuries Associated with Penetrating Thoracic Trauma**

1. ____________________________ Pneumothorax
   - Open Pneumothorax
   - ____________________________ Pneumothorax
   - ____________________________
   - Hemopneumothorax
   - Great Vessel laceration
   - Tracheobronchial tree lacerations

2. ____________________________ lacerations
   - Penetrating cardiac injuries
   - Pericardial ____________________________
   - ____________________________ injuries
   - Diphragm Injuries
   - Intra-abdominal penetration with organ injuries

23 **Chest Wall Injuries**

24 Chest wall injuries are the most ____________________________ result of blunt injury
S/S of Chest Wall Injury
- Reddening due to capillary dilation
- Ecchymosis
- Pain on breathing
- Limited sounds
- Hypoventilation
- Biggest concern: “It hurts to breathe”
- Paradoxical chest wall motion

Clavicular Fractures (1 of 2)
- One of the most commonly fractured bones in the body
- Very common due to
  - Utilization of hand and arm to break a fall

Signs and symptoms:
- Pain
- Point
- Evident

Clavicular Fractures (2 of 2)
- Complications
  - Injury to the vein or artery from bony fragment penetration, producing a hematoma or venous thrombosis (rare)

Treatment:
- Usually accomplished with a and swathe or a clavicular strap that immobilizes the affected shoulder and arm
- Usually heals well within 4 to 6 weeks

Rib Fractures (1 of 3)
>50% of significant chest trauma cases due to blunt trauma
- forces flex and fracture ribs at weakest points
- Ribs 1-3 requires great force to fracture
  - Possible underlying lung injury

Rib Fractures (2 of 3)
- Ribs are most commonly fractured
- Ribs 9-12 less likely to be fractured
  - Transmit energy of trauma to internal organs
  - If fractured, suspect and spleen injury
- Hypoventilation is COMMON due to

Rib Fractures (3 of 3)
Multiple Rib Fractures

- Assessment findings
  - Localized pain
  - Pain that worsens with deep breathing, and coughing
  - Point tenderness
  - Most patients can localize the fracture by pointing to the area (confirmed by palpation).
  - __________ or audible crunch
  - __________ on respiration

Complications of Rib Fractures

- __________
- Atelectasis: (alveolar collapse) due to hypoventilation
- Inadequate cough
- __________
- Laceration of underlying structures

Rib Fractures Management

- Airway and ventilation
  - High-concentration oxygen
  - Positive-pressure ventilation
  - Encourage __________ and deep breathing
- Pharmacological
  - __________
- Nonpharmacological
  - Non-circumferential __________ (Sling/Swathe)

Flail Chest (1 of 4)

- Segment of the chest that becomes free to move with the pressure changes of respiration
  - __________ or more adjacent rib fracture in two or more places
  - Serious chest wall injury with underlying pulmonary injury
  - Reduces __________ of respiration
  - Adds to increased __________

Flail Chest (2 of 4)

- Can lead to respiratory failure due to:
  - Underlying pulmonary __________
  - The blunt force of the injury typically produces an underlying pulmonary contusion.
  - Associated intrathoracic injury
  - Inadequate __________ action of the chest

Flail Chest (3 of 4)

- __________ flail segment movement
  - Over time, the __________ splinting the flail segment will fatigue and paradoxical respiration will become more evident.
• Positive pressure ventilation can restore __________________________ volume

37  Flail Chest (4 of 4)

38  Flail Chest Assessment Findings
• Chest wall contusion
• Respiratory distress
• __________________________ chest wall movement
• Pleuritic chest pain
• __________________________
• Pain and splinting of affected side
• Tachypnea
• __________________________
• Possible bundle branch block on ECG

39  Paradoxical movement of the chest wall seen in flail chest

40  Paradoxical Motion

41  Flail Chest Morbidity/Mortality
• Significant chest trauma
• Mortality rates 20-40% due to associated injuries
• Mortality increased with:
  – Advanced __________________________
  – Seven or more rib fractures
  – __________________________ or more associated injuries
  – Shock
  – __________________________ injuries

42  Flail Chest Management (1 of 2)
• Airway and ventilation, oxygenation
• __________________________ -pressure ventilation may be needed.
  – Reverses the mechanism of paradoxical chest wall movement
  – Restores the __________________________ volume
  – Reduces the pain of chest wall movement
  – May promote the development of a __________________________ due to the increased pulmonic pressures

43  Flail Chest Management (2 of 2)
• Assess for the __________________________ of a pneumothorax/tension pneumothorax
• Evaluate the need for endotracheal intubation.
• __________________________ the flail segment (controversial).
• Establish IV, but restrict fluids if pulmonary contusion suspected
• Monitor ECG
• Consider __________________________ for pain
Sternum Fracture and Dislocation
- Associated with severe blunt trauma
- Typical MOI: Blow (i.e. Steering wheel)
- Incidence: 5-8%
- Mortality: 25-45%
- Myocardial contusion, Pericardial tamponade, Cardiac rupture, Pulmonary contusion
- Dislocation uncommon but same MOI as fracture
  - Depression if posterior

Sternal Fractures Management
- Airway, ventilation, oxygenation
- Circulation—restrict if pulmonary contusion suspected
- Pharmacological—analgesics
- Nonpharmacological—allow chest wall self-splinting
- Monitor ECG for

Pulmonary Injuries
Simple Pneumothorax
- AKA: Pneumothorax
- Occurs when lung tissue is disrupted and air leaks into the space
- Lung can eventually collapse and lead to hypoxemia
- May occur in the absence of rib fractures from a sudden increase in intrathoracic pressure generated when the chest wall is compressed against a closed glottis (the paper-bag effect)
- Can progress into Pneumothorax

Pneumothorax Pathology
- Air accumulates in pleural space, Lung collapse, reduced gas exchange
- Alveoli collapse, reduced gas exchange
- Ventilation/Perfusion Mismatch
  - Increased ventilation but no alveolar perfusion
  - Reduced respiratory efficiency results in
- Typical MOI: Rib fractures, penetrating trauma or “Paper Bag Syndrome”

Simple (Closed) Pneumothorax

S/S of Closed Pneumothorax (1 of 2)
- Tachycardia
- Respiratory distress
- Absent or decreased breath sounds on the affected side
- Upon percussion

S/S of Closed Pneumothorax (2 of 2)
• Decreased chest movement
• Dyspnea
• Chest pain referred to the shoulder or arm on the affected side
• Slight chest pain

### Closed Pneumothorax Management (1 of 2)
- Airway and ventilation
- High-concentration .
- Positive-pressure ventilation if necessary.
- If respiration rate is <________ or >________ per minute, ventilatory assistance with a bag-valve mask may be indicated.

### Closed Pneumothorax Management (2 of 2)
- Needle if S/S of tension pneumothorax
- IV, restrict unless needed for volume replacement
- Monitor ECG

### Open Pneumothorax (1 of 3)
- AKA: Chest Wound
- Free passage of air between atmosphere and pleural space
- Air replaces lung tissue
- ________ shifts to uninjured side
- Severity is directly proportional to the size of the wound.
  - Profound can result.
  - Death is related to delayed management.
- Air will be drawn through wound if wound is __________ diameter of the trachea or large

### Open Pneumothorax (2 of 3)
- If the chest wound opening is greater than two-thirds the diameter of the trachea, air follows the path of least resistance through the chest wall with each .
- As the air accumulates in the pleural space, the lung on the injured side ________ and begins to shift toward the uninjured side.

### Open Pneumothorax (3 of 3)
- Very little air enters the tracheobronchial tree to be exchanged with intrapulmonary air on the affected side, which results in alveolar ventilation and decreased perfusion.
- The normal side also is adversely affected because expired air may enter the lung on the collapsed side, only to be ________ into the functioning lung with the next ventilation.
- May result in severe ventilatory dysfunction, hypoxemia, and death unless rapidly recognized and .
Open Pneumothorax

S/S of an Open Pneumothorax
- Penetrating chest trauma
- Sucking chest wound
- ____________ blood at wound site
- Severe ____________
- Subcutaneous emphysema
- Decreased lung sounds on affected side

Open Pneumothorax Management (1 of 3)
- Airway and ventilation
- High-concentration oxygen.
- Positive-pressure ventilation, if necessary.
- Assist ventilations with a bag-valve device and ____________ as necessary.
- Monitor for the development of a tension pneumothorax.
- Circulation—treat for ____________ with crystalloid infusion.

Open Pneumothorax Management (2 of 3)
- ____________ the open wound—apply an occlusive petroleum gauze dressing (covered with sterile dressings) and secure it with tape.

Open Pneumothorax Management (3 of 3)
- IV, watch for ____________ edema
- Monitor ____________
- If tension pneumothorax occurs, relieve pressure by ____________ removing a portion of the occlusive dressing

Tension Pneumothorax (1 of 2)
- Buildup of air under pressure in the thorax due to a flap formation at tear
- Excessive ____________ reduces effectiveness of respiration
- Air is unable to escape from inside the pleural space
- Progression of Simple or Open Pneumothorax
- ____________ Life Threat

Tension Pneumothorax (2 of 2)

S/S of Tension Pneumothorax (1 of 3)
- Extreme ____________
- Cyanosis
- Increasing ____________
Difficult ventilations while being assisted
• Tracheal deviation (a late sign)
• ____________________________________

S/S of Tension Pneumothorax (2 of 3)
• Tachycardia
• Diminished or absent breath sounds on the ___________________________ side
• ____________________________________
• Respiratory distress

S/S of Tension Pneumothorax (3 of 3)
• ____________________________________ of the intercostal muscles
• Subcutaneous emphysema
• Jugular venous distention (unless hypovolemic)
• ____________________________________ expansion of the chest (tension does not fall with respiration)
• Hyperresonance to ____________________________________

Subcutaneous Emphysema

Management of Tension Pneumothorax (1 of 2)
• Maintain airway, ventilations, and oxygenation
• Confirmation is the most critical aspect
  – Dyspnea
  – _____________________________ : absent or decreased
  – Percussion: hollow sounding
  – Tracheal shift: ___________________________ from injured side
• Pleural Decompression

Management of Tension Pneumothorax (1 of 2)
• _____________________________ open wound
• Needle thoracostomy (pleural _____________________________)
• _____________________________ thoracostomy—in-hospital management
• IV
• Monitor ECG

Pleural Decompression (1 of 2)
• ___________nd or ___________rd intercostal space in mid-clavicular line or mid axillary line (check protocols)
• ___________________________ OF RIB
• Consider multiple decompression sites if patient remains symptomatic
• Large 2” over the needle catheter: 14 or 16ga
• Create a one-way-valve: Glove tip or Heimlich valve (refer to protocols)

Pleural Decompression (2 of 2)
Hemothorax (1 of 2)
• Accumulation of ____________________________ in the pleural space
• Serious hemorrhage may accumulate 1,500 mL of blood
  – Each side of thorax may hold up to 3,000 mL
• Blood loss in thorax causes a ____________________________ in tidal volume
  – Ventilation/Perfusion Mismatch & Shock
• Typically accompanies ____________________________ called a hemopneumothorax

Hemothorax (2 of 2)
• Caused by blunt or penetrating trauma.
  • ____________________________ fractures are frequent cause.
• Associated with great vessel or ____________________________ injury
• Mortality rate of __________%
  – 50% of these patients will die immediately.
  – 25% of these patients live 5 to 10 minutes.
  – 25% of these patients may live 30 minutes or longer.

S/S of a Hemothorax (1 of 2)
• Blunt or penetrating chest trauma
• Shock
• ____________________________________
• ____________________________________
• Tachypnea
• ____________________________________
• Hypotension
• Pale, cool, moist skin

S/S of a Hemothorax (2 of 2)
• Diminished or ____________________________ breath sounds on the affected side
• Hyporesonance (dullness on percussion) on the affected side
• Narrowed ____________________________ pressure
• Tracheal deviation ____________________________ the unaffected side (rare)

Hemothorax Physical Findings

Management of Hemothorax
• Airway, ventilation, oxygenation
  – Ventilatory support with bag-valve mask, intubation, or both
• Administer volume-expanding fluids to correct hypovolemia
  – 2 large bore IVs to maintain SBP @ __________ - __________
• EVALUATE ____________________________ SOUNDS for fluid overload
• Monitor ECG
Hemothorax

Hemopneumothorax
- Pneumothorax with __________________________ in the pleural space
- Assessment findings and management are the same as for __________________________.

Pulmonary Contusion (1 of 2)
- The most __________________________ potentially lethal chest injury
  - Mortality—between 14% and 20%
- Soft tissue __________________________ of the lung
- 30-75% of patients with significant blunt chest trauma
- Frequently associated with __________________________ fracture

Pulmonary Contusion (2 of 2)
- Typical MOI
  - __________________________: Chest impact on steering wheel
- Microhemorrhage may account for 1- 1 ½ L of blood loss in alveolar tissue
  - Progressive deterioration of ventilatory status
- May be __________________________ due to the high incidence of other associated injuries

Signs and Symptoms of Pulmonary Contusion
1. Blunt or penetrating chest trauma
   - Increasing dyspnea
   - Increasing crackles
   - Diminishing breath sounds
2. Cough
   - Signs and symptoms of shock
   - Tachypnea
   - Tachycardia

Management of Pulmonary Contusion
- Airway, ventilation, oxygenation
  - Positive-pressure ventilation, if
- Circulation—restrict IV fluids (use caution __________________________ fluids in hypovolemic patients).
- Monitor ECG

Cardiovascular Injuries

Myocardial Contusion (1 of 3)
- The most common cardiac injury after a blunt trauma to the chest
  - Occurs in 76% of patients with severe blunt chest trauma
• Atrium and Ventricle is commonly injured
• Injury may reduce strength of cardiac
  – Reduced cardiac output
• Disturbances due to irritability of damaged myocardial cells

86 Myocardial Contusion (2 of 3)
Progressive Problems will develop:
• Hemoperitoneum
• Myocardial necrosis
• 
• CHF & or __________________________ shock

87 Myocardial Contusion (3 of 3)

88 S/S of Myocardial Contusion
• __________________________ of chest wall
• Tachycardia and/or __________________________ rhythm
• Retrosternal pain similar to MI
• Associated injuries
  - Rib/Sternal fractures
• Chest pain unrelieved by __________________________
  - May be relieved with rest
  - This is TRAUMA-related pain
  - Similar signs and symptoms of __________________________ chest pain

89 Management of Myocardial Contusion
• Airway, ventilation, __________________________
• IV access
• Monitor ECG
• Pharmacological
  – __________________________
  – __________________________

90 Myocardial Aneurysm or Rupture
• Occurs almost exclusively with extreme blunt thoracic trauma
• Secondary due to __________________________ resulting from MI
• Signs & Symptoms
  - Severe rib or sternal __________________________
  - Possible signs and symptoms of cardiac __________________________
  - If affects valves only: S/S of heart failure
  - Absence of vital signs

91 Traumatic Aneurysm or Aortic Rupture (1 of 2)
• Aorta most commonly injured in severe blunt or penetrating trauma
  - 85-95% mortality
• Typically patients will survive the initial injury insult
  -30% mortality in ____________ hrs
  -50% mortality in _____________ hrs
  -70% mortality in _________ week

92 □ Traumatic Aneurysm or Aortic Rupture (2 of 2)
  • Injury may be confined to areas of aorta ________________________________
  • Signs & Symptoms
    -Rapid deterioration of ________________________________
    -________________________ deficit between right and left upper or lower extremities

93 □ Pericardial Tamponade
  • Restriction to cardiac filling caused by blood or other fluid within the ____________
  • Occurs in <2% of all serious chest trauma
    -However, very high ________________________________
  • Results from tear in the coronary artery or penetration of ________________________________
    -Blood seeps into pericardium and is unable to escape
    -200-300 ml of blood can restrict effectiveness of cardiac contractions
    -Removing as little as _____________ ml can provide relief

94 □ S/S of Pericardial Tamponade (1 of 2)
  • Dyspnea
  • Possible cyanosis
  • __________________________ Triad
    – JVD
    – Distant heart ________________________________
    – Hypotension or narrowing pulse pressure
  • Weak, thready pulse
  • __________________________

95 □ S/S of Pericardial Tamponade (2 of 2)
  • __________________________ signs: decrease or absence of JVD during inspiration
  • __________________________ Paradoxus: Drop in SBP >10 mmHg during inspiration
    – Due to increase in CO2 levels during inspiration
  • ECG Changes

96 □ Pericardial Tamponade Physical Findings

97 □ Management of Pericardial Tamponade
  • Airway, ventilation, oxygenation
  • IV fluid _____________________________ to maintain BP
  • Rapid _____________________________
• Patient needs a ________________________________ (in-hospital management)

98  □  Other Cardiovascular Injuries (1 of 2)
• Rupture or laceration of:
  - Superior Vena Cava
  - ________________________________ Vena Cava
  - General Thoracic Vasculature
• Blood Localizing in ________________________________
• Compression of:
  - Great vessels
  - ________________________________
  - Esophagus

99  □  Other Cardiovascular Injuries (2 of 2)
• General Signs & Symptoms
  - Penetrating Trauma
  - ________________________________ & Shock
  - Hemothorax or ________________________________
• Treatment is airway, ventilation, oxygenation and fluid resuscitation as needed
• Monitor ECG

100 □  Other Thoracic Injuries

101 □  Traumatic Rupture or Perforation of the Diaphragm
• MOI
  - High pressure blunt chest trauma
  - ________________________________ trauma
• Most common in patients with ________________________________ chest injury
• Most often occurs on ________________________________ side
• Compression of the lung with reduced ventilation

102 □  S/S of Traumatic Rupture or Perforation of the Diaphragm
• Herniation of ________________________________ organs into thorax
  - Displacement of ________________________________
  - Abdomen may appear hollow
  - Bowel sounds may be noted in ________________________________
• Similar to tension pneumothorax
  - Dyspnea, Hypotension & ________________________________
  - Evaluate for other injuries

103 □  Diaphragmatic Rupture Management
• Airway, ventilation, oxygenation
  – Caution: positive pressure may ________________________________ the injury
• ________________________________ access
• Do not place patient in ________________________________ position

104 □  Traumatic Esophageal Rupture
• ____________________________________ complication of blunt thoracic trauma
• 30% mortality
• Contents in esophagus/stomach may move into mediastinum
  - Serious ________________________________ occurs
  - Chemical irritation
  - Damage to mediastinal structures
  - Air enters mediastinum
• Subcutaneous ________________________________ and penetrating trauma present

105 Management of Traumatic Esophageal Rupture
  • Determination is ________________________________ in pre-hospital setting
  • Management is to ________________________________ signs/symptoms
  • IV access
  • Monitor ECG

106 Tracheobronchial Injury
  • MOI
    - Blunt trauma
    - Penetrating trauma
  • ___________% of patients with injury die within 1 hr of injury
  • Disruption can occur ________________________________ in tracheobronchial tree

107 S/S of Tracheobronchial Injury
  • Dyspnea, cyanosis
  • ________________________________
  • Massive subcutaneous ________________________________
  • Suspect/Evaluate for other closed chest trauma

108 Management of Tracheobronchial Injury
  • ________________________________ therapy
  • Keep airway clear
  • Administer high flow O2
  • Consider ________________________________ if unable to maintain patent airway
  • Observe for development of tension pneumothorax and SQ

109 Traumatic Asphyxia
  • Results from severe ________________________________ forces applied to the thorax
  • An increase in intrathoracic pressure forces blood from the right side of the heart into the veins of the upper thorax, neck, and face.
  • ________________________________ veins engorge and capillaries rupture.

110 S/S of Traumatic Asphyxia
  • Head & Neck become engorged with ________________________________
  • Skin becomes deep red, purple, or blue
• NOT __________________________ RELATED
• JVD
• Hypotension results once the pressure is released.
• Hypoxemia, Shock
• Face and __________________________ swollen
• Bulging eyes with conjunctival hemorrhage

111 Traumatic Asphyxia

112 Management of Traumatic Asphyxia
• Airway, Ventilation, Oxygenation
• PPV with BVM to assure adequate ventilation
• __________________________ as needed
• 2 large bore IV’s to maintain BP
• If entrapment > 20 min with chest compression, consider 1mEq/kg of Sodium Bicarbonate for __________________________ syndrome

113 Assessment of the Thoracic Trauma Patient
• Scene Size-up
• Primary Assessment
• Rapid Scan
  – Observe for JVD, SQ Emphysema, Expansion
  – Palpate, Auscultate and __________________________
• Treat only life-threatening conditions on scene
• Begin __________________________ quickly
• Continue treatment en route
• __________________________

114 General Management of the Chest Injury Patient (1 of 2)
Ensure __________________________
• High flow O2 via NRB
• __________________________ if indicated; consider RSI
• Consider __________________________ ventilation
  -If minute volume less than 6,000 mL
  -BVM at a rate of __________________________
  -May be beneficial for chest contusion and rib fractures
  -Promotes oxygen perfusion of alveoli and prevents __________________________

115 General Management of the Chest Injury Patient (2 of 2)
• Anticipate __________________________ Compromise
• Shock Management
  -Fluid Boluses to maintain BP
• __________________________ dressings for penetrating wounds
• Monitor __________________________
• AUSCULATE! AUSCULATE! AUSCULATE!