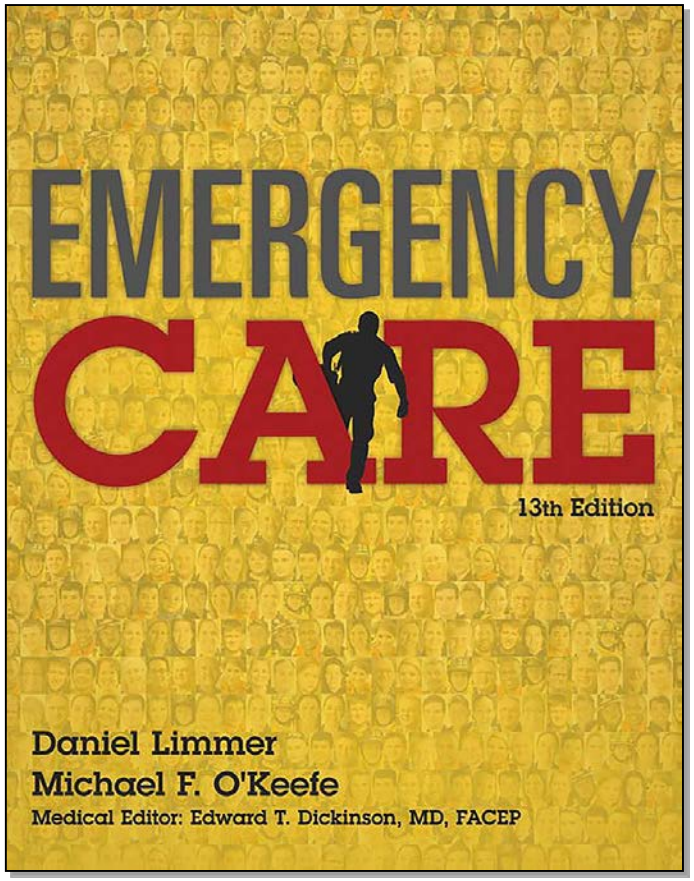
Emergency Care

THIRTEENTH EDITION



CHAPTER 27

Chest and Abdominal Trauma

Multimedia Directory

Topics

- Chest Injuries
- Abdominal Injuries

Chest Injuries

Chest Injuries

- Blunt trauma
  - Can fracture ribs, sternum, and costal (rib) cartilages
- Compression
  - Occurs when severe blunt trauma causes the chest to rapidly compress

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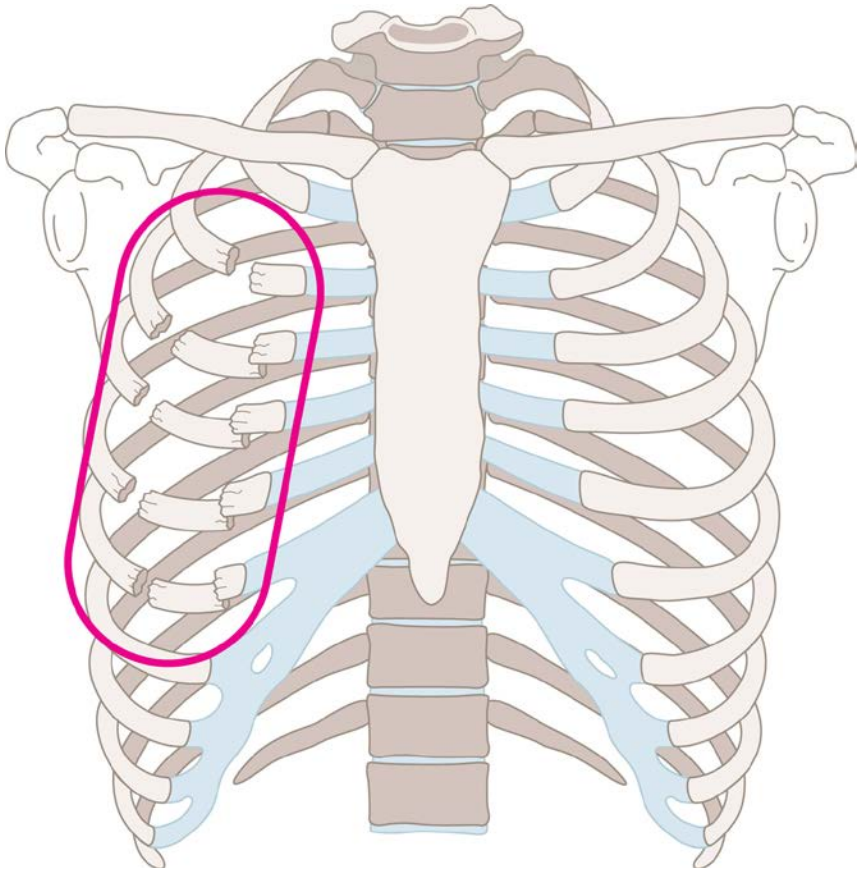
Chest Injuries

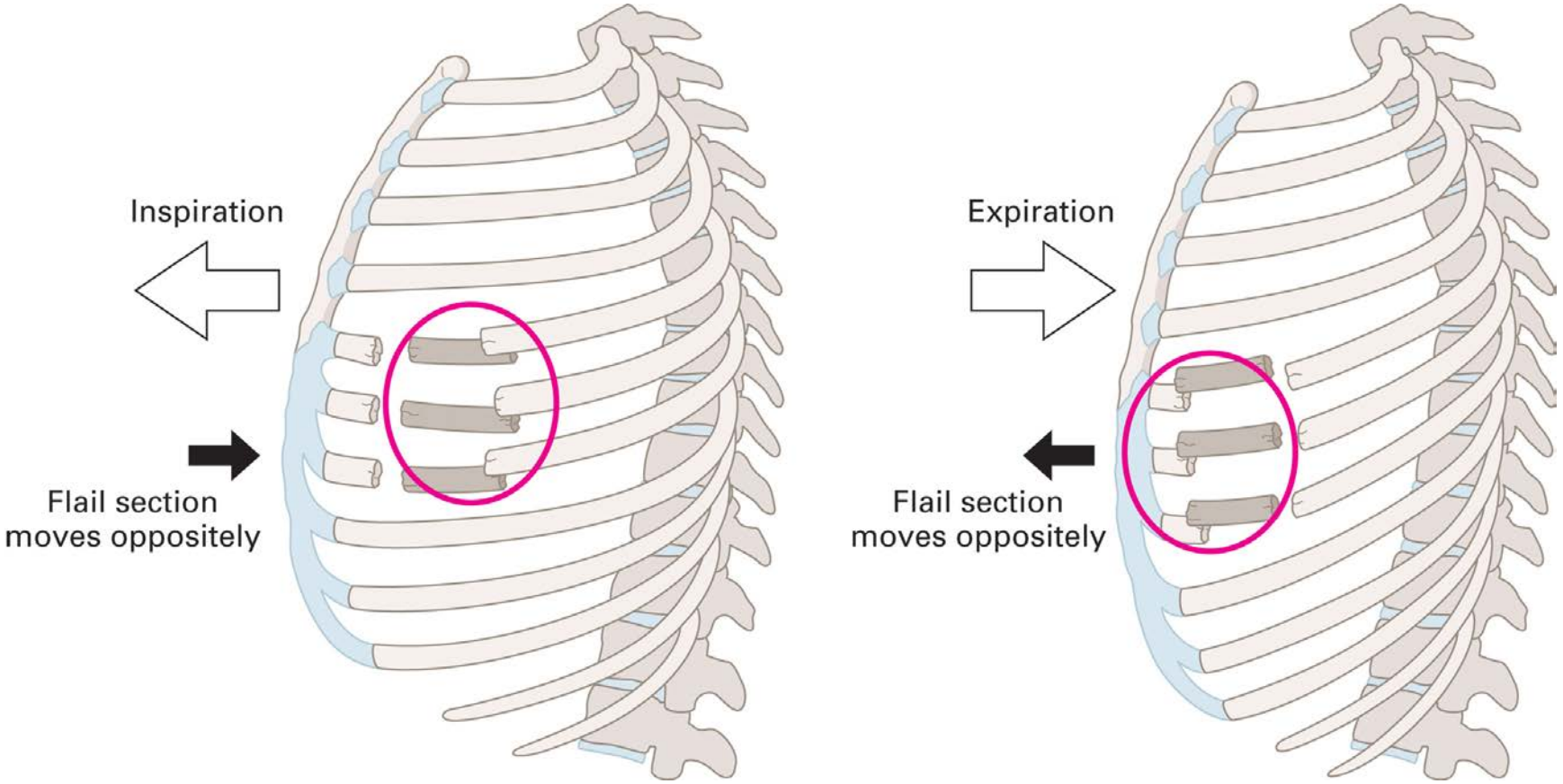
- Penetrating objects
  - Bullets, knives, pieces of metal or glass, steel rods, pipes, other objects
  - Can damage internal organs and impair respiration

Closed Chest Injuries



Flail chest occurs when blunt trauma creates a fracture of two or more ribs in two or more places.

Closed Chest Injuries



Paradoxical motion.

Closed Chest Injuries

- Flail chest
  - Fracture of two or more consecutive ribs in two or more places
- Paradoxical motion
  - Movement of flail segment is opposite to movement of the remainder of the chest cavities.

Patient Assessment

- Mechanism of injury capable of causing injury
- Difficulty breathing/hypoxia
- Pain at injury site
- Likely signs of shock and hypoxia
- Chest wall muscle contraction

Patient Care

- Primary assessment for life threats
- Administer oxygen.
- If patient is breathing inadequately, assist ventilation.
- Follow local protocols regarding using noninvasive positive pressure ventilations.
- Monitor patient carefully.
- Watch respiratory rate and depth.

Open Chest Injuries

- Difficult to tell what is injured from entrance wound
- Assume all wounds are life-threatening.
- Open wounds allow air into chest.
  - Sets imbalance in pressure
  - Causes lung to collapse

Patient Assessment

- "Sucking chest wound"
- Chest cavity is open to atmosphere
- May or may not be a sucking sound
- May be gasping for air

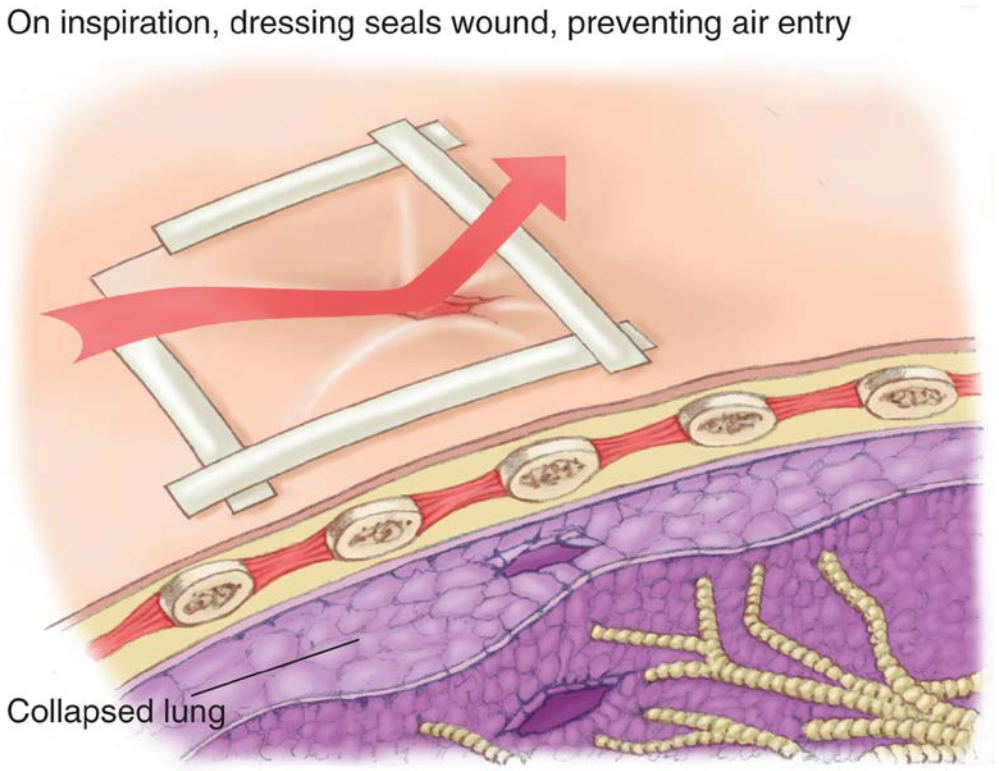
Patient Care

- Maintain open airway.
- Seal wound.
- Apply occlusive dressing.
- Administer high-concentration oxygen.
- Care for shock.
- Immediate transport.
- Consider ALS.

Occlusive and Flutter-Valve Dressings

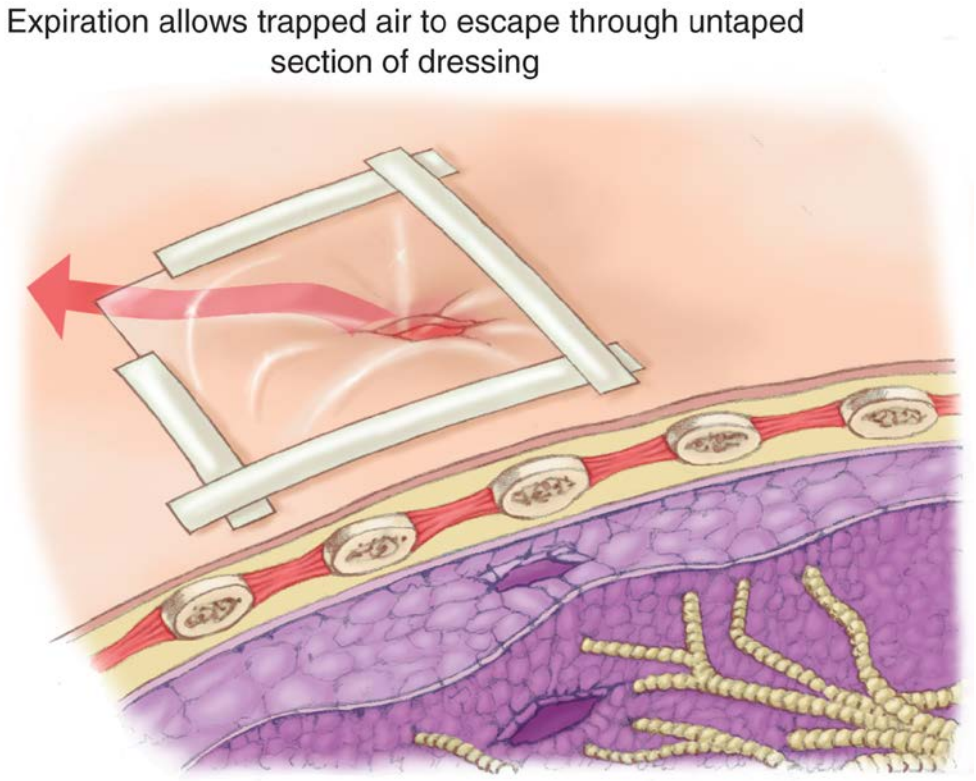
- Involve taping dressing in place and leaving a side or corner of dressing unsealed
- As patient inhales, dressing will seal wound.
- As patient exhales, free corner or edge acts as flutter valve to release air trapped in chest cavity.

Occlusive and Flutter-Valve Dressings



Creating a flutter valve to allow air to escape from the chest cavity.

Occlusive and Flutter-Valve Dressings



Creating a flutter valve to allow air to escape from the chest cavity.

Think About It

- Does the patient's chest injury need to be treated during the primary assessment?
- Does the open chest injury require an occlusive dressing?
- Does the patient's injury necessitate immediate transport to a trauma center?

Injuries Within the Chest Cavity

- Pneumothorax and pneumothorax
- Hemothorax and hemopneumothorax
- Traumatic asphyxia
- Cardiac tamponade
- Aortic injury and dissection

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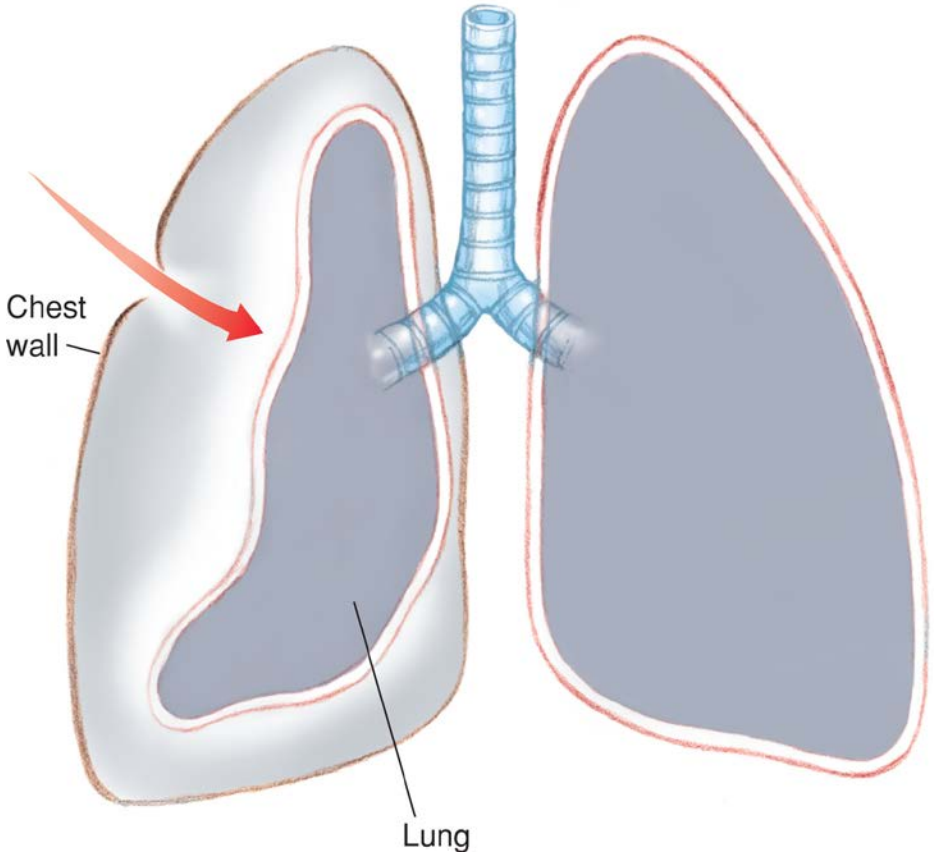
Injuries Within the Chest Cavity

- Pneumothorax and tension pneumothorax
  - Pneumothorax
    - When air enters chest cavity, possibly causing lung collapse
  - Tension pneumothorax
    - A type of pneumothorax where air that enters the chest cavity is prevented from escaping

Injuries Within the Chest Cavity



Air can enter the chest cavity through a puncture in the chest wall. This can cause a collapse of a lung and impaired breathing.

Injuries Within the Chest Cavity

- Pneumothorax and tension pneumothorax
  - Patients typically have diminished or absent lung sounds on affected side.

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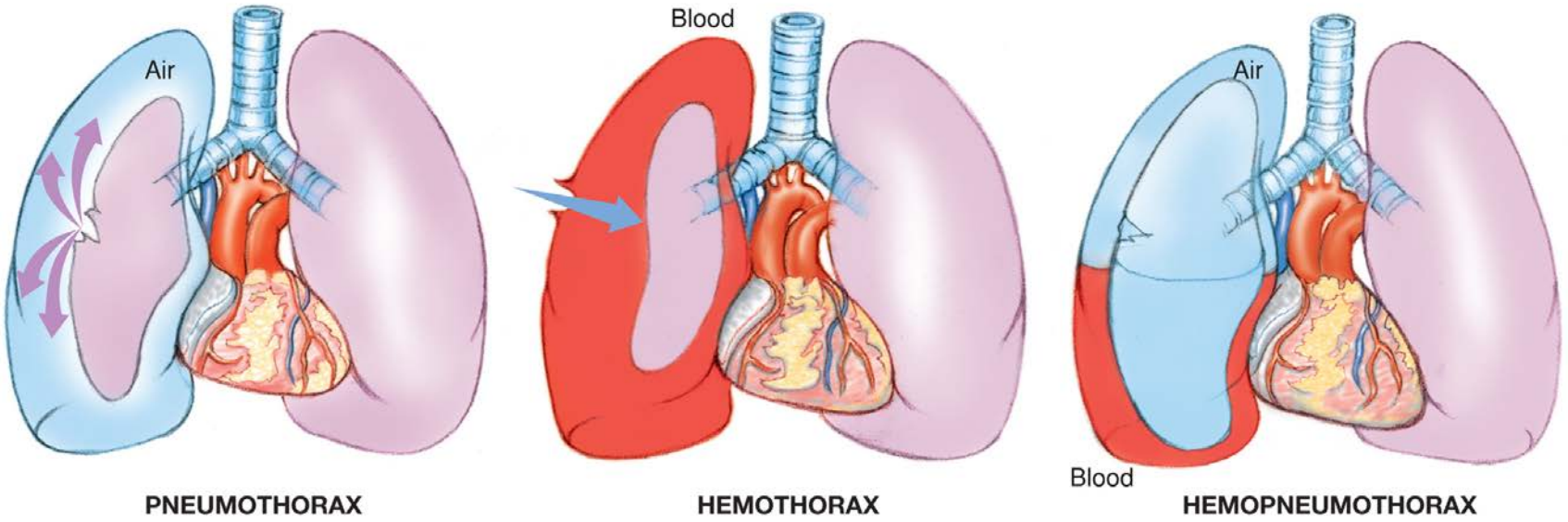
Injuries Within the Chest Cavity

- Hemothorax and hemopneumothorax
  - Hemothorax
    - Chest cavity fills will blood.
  - Hemopneumothorax
    - Chest cavity fills with both blood and air.

Hemothorax and Hemopneumothorax



Pneumothorax, hemothorax, and hemopneumothorax.

Injuries Within the Chest Cavity

- Traumatic asphyxia
  - Sudden compression of chest forcing blood out of organs and rupturing blood vessels
  - Neck and face are a darker color than rest of the body
  - May cause bulging eyes, distended neck veins, broken blood vessels in face

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Injuries Within the Chest Cavity

- Cardiac tamponade
  - Direct injury to heart causing blood to flow into the pericardial sac around the heart
  - Pericardium is a tough sac that rarely leaks.
  - Increased pressure on heart so chambers cannot fill

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Injuries Within the Chest Cavity

- Cardiac tamponade
  - Blood backs up into veins.
  - Usually a result of penetrating trauma
  - Distended neck veins
  - Shock and narrowed pulse pressure

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Injuries Within the Chest Cavity

- Aortic injury and dissection
  - Aorta is the largest blood vessel in the body.
  - Penetrating trauma can cause direct damage.
  - Blunt trauma can sever or tear the aorta.
  - Damage can cause high-pressure bleeding; often fatal.

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Injuries Within the Chest Cavity

- Aortic injury and dissection
  - Patient complains of pain in chest, abdomen, or back.
  - Signs of shock
  - Differences in pulse or blood pressure between right and left arms or differences in pulses between arms and legs or the legs themselves

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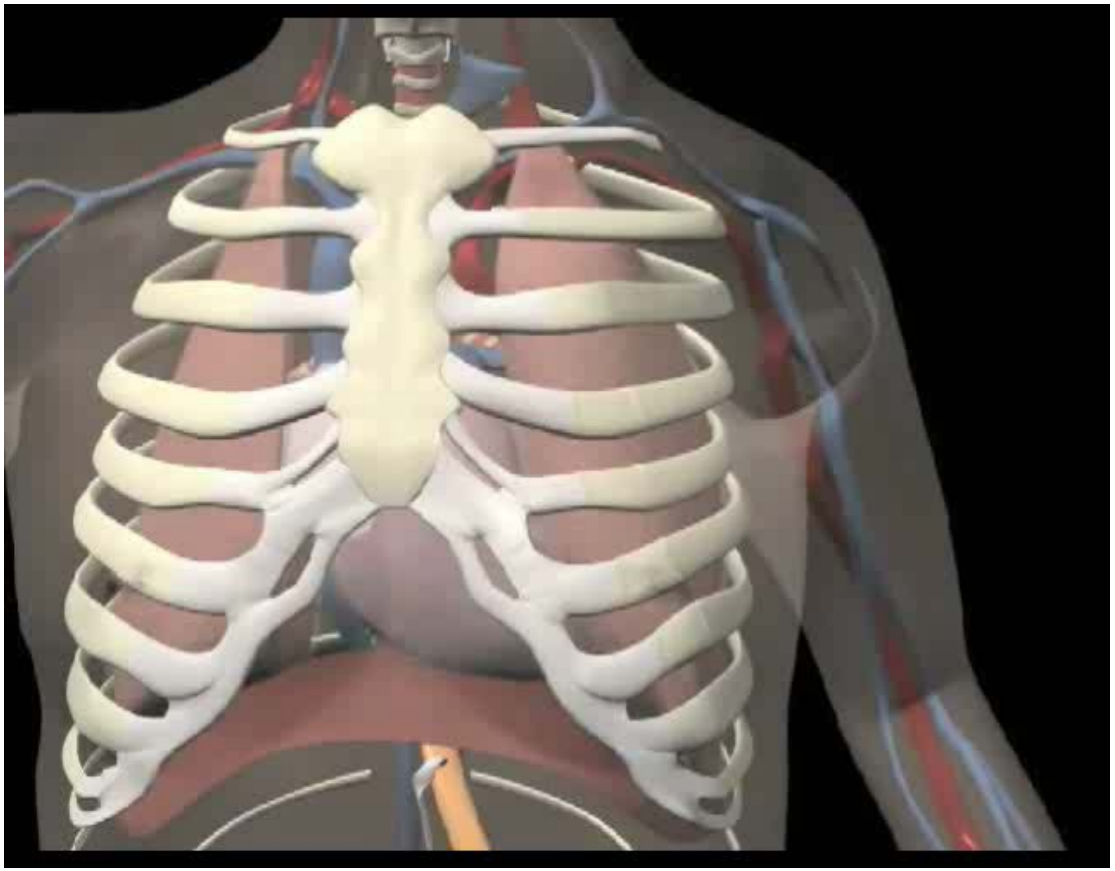
Injuries Within the Chest Cavity

- Commotio cordis
  - Uncommon condition
  - Trauma to chest when heart is vulnerable
  - If untreated, patient will go into ventricular fibrillation (VF).
  - Treat like a VF patient.
    - CPR, defibrillation

Open Pneumothorax and Hemothorax Animation



Click on the screenshot to view an animation about open pneumothorax and hemothorax.

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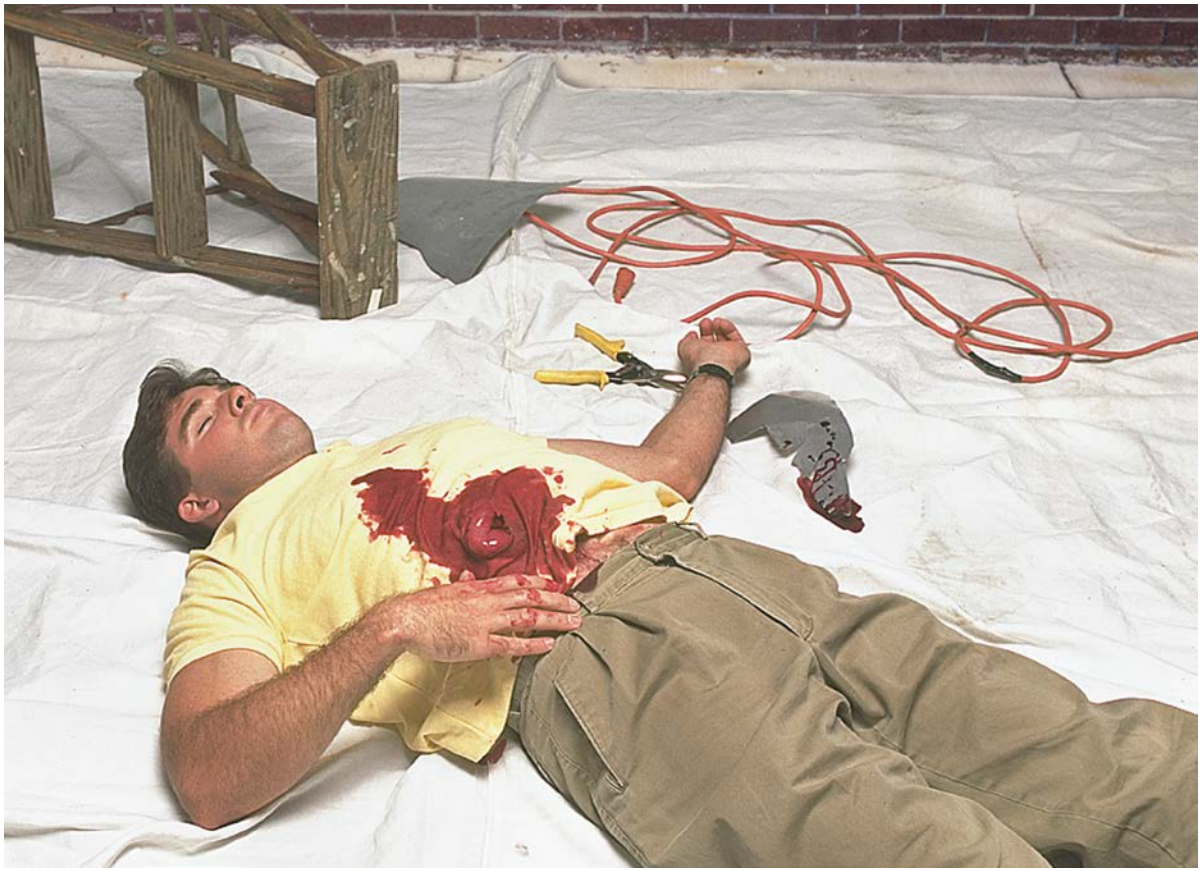
Abdominal Injuries

Abdominal Injuries

- Can be open or closed
- Internal bleeding can be severe if organs or blood vessels are lacerated or ruptured.
- Serious, painful reactions if hollow organs rupture.
- Evisceration may occur.
  - Organs protruding through wound opening

Abdominal Injuries



First Take Standard Precautions.
Cover the dressed wound to maintain warmth. Secure the covering with tape or cravats tied above and below the position of the exposed organ.

Patient Assessment

- Pain, initially mild but rapidly becoming intolerable
- Cramps
- Nausea
- Weakness
- Thirst
- Obvious lacerations and puncture wounds to abdomen

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Patient Assessment

- Lacerations and punctures wounds to pelvis, and middle and lower back
- Indications of blunt trauma
- Indications of developing shock
- Coughing up or vomiting blood
- Rigid and/or tender abdomen
- Distended abdomen
- Patient tries to lie very still.

Patient Care

- Stay alert for vomiting; keep airway open.
- Place patient on back with legs flexed at knees to reduce tension on abdominal muscles.
- Administer high-concentration oxygen.
- Care for shock.

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Patient Care

- Give nothing to patient by mouth.
- Continuously monitor vital signs.
- Transport as soon as possible.

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Patient Care

- Additional steps for open abdominal injuries
  - Control external bleeding and dress all wounds.
  - Do not touch or replace eviscerated organs.
    - Apply sterile dressing moistened with sterile saline over wound site.

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Patient Care

- Additional steps for open abdominal injuries
  - Do not touch or replace eviscerated organs.
    - For large evisceration, maintain warmth by placing layers of bulky dressing over occlusive dressing.
  - Do not remove any impaled object.

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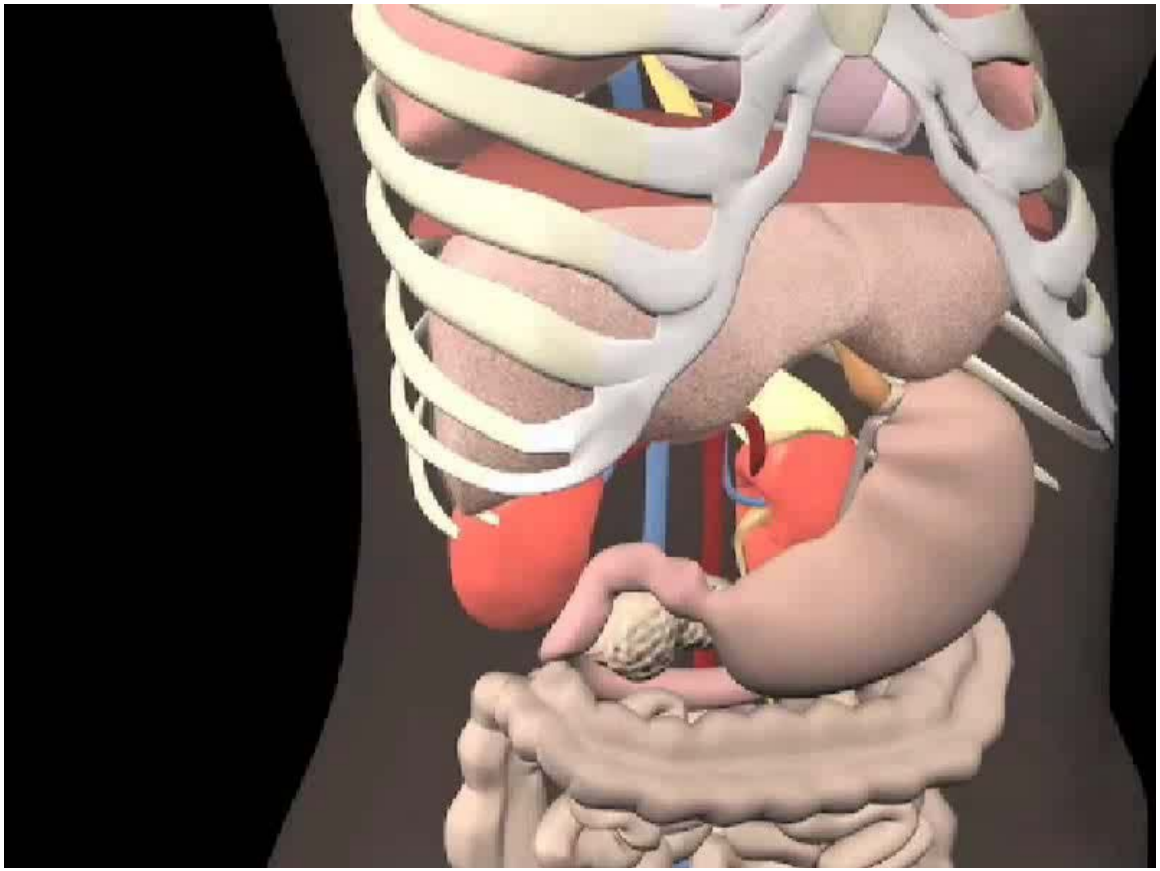
Patient Care

- Additional steps for open abdominal injuries
  - Stabilize with bulky dressings bandaged in place.
  - Leave patient's legs in position found to avoid muscular movement that may move impaled object.

Liver Injuries Animation



Click on the screenshot to view an animation on the topic of liver injuries.

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Chapter Review

Chapter Review

- An open chest or abdominal wound is considered to be one that penetrates not only the skin but the chest and abdominal wall to expose internal organs. Open chest and abdominal wounds are life threatening. For an open chest or abdominal wound, apply an occlusive dressing.

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Chapter Review

- For both open and closed injuries, take appropriate Standard Precautions, note the mechanism of injury, protect the patient's airway and breathing, administer high-concentration oxygen by nonrebreather mask, treat for shock, and transport.

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Chapter Review

- A flail chest is characterized by paradoxical motion. If the patient is unable to adequately breathe, assist the patient's ventilations.

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Chapter Review

- Seal an open chest wound with an occlusive dressing taped on three sides or in some other manner so it acts as a one-way valve, allowing air out of the chest but not in. Alternatively, use a commercial device such as the Asherman Chest Seal with a one-way valve to relieve pressure.

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Chapter Review

- Monitor the patient for changes, and be prepared to manually relieve any pressure in the chest.
- Closed chest wounds are sometimes difficult to distinguish or may occur together. Assess the patient, including breath sounds, and maintain ventilation, oxygenation, and perfusion.

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Chapter Review

- A patient who collapses in cardiac arrest after a force to the center of the chest should receive CPR and defibrillation like any other arrest from a cardiac cause.
- If a patient develops signs of tension pneumothorax, arrange immediately for ALS intercept or transport promptly to a facility that can treat this injury.

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Chapter Review

- When solid abdominal organs are injured, life-threatening amounts of blood loss can occur.
- When hollow abdominal organs are injured, their contents spill into the abdominal cavity causing irritation.

Remember

- Blunt trauma, penetrating trauma, and compression are mechanisms that can injure the chest and abdomen.
- *Open* or *closed* pertains to the integrity of the chest or abdominal wall after injury.
- Seal open chest wounds to prevent air from entering the chest cavity.

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Remember

- Closed chest and abdominal wounds bear a high risk for underlying organ system damage and internal bleeding. Use mechanism of injury and patient assessment to recognize the signs and symptoms of shock.

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Remember

- EMTs should learn signs and symptoms, and treatment procedures for specific chest and abdominal injuries.

Questions to Consider

- Is the patient's breathing adequate, inadequate, or absent?
- Is the patient displaying signs of shock?
- Is there an open wound in the chest that needs to be sealed?

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Questions to Consider

- Is the patient displaying signs of a tension pneumothorax?
- Is there an open wound in the abdomen that needs to be dressed and covered?

Critical Thinking

- You are caring for a patient who was shot in the chest with a nail gun. You applied an occlusive dressing around the wound. The patient is suddenly deteriorating. He is having extreme difficulty breathing and his color has worsened.

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Critical Thinking

- Breath sounds have become almost totally absent on the side with the impaled nail. What complication might you suspect is causing his worsening condition? How could this be corrected?