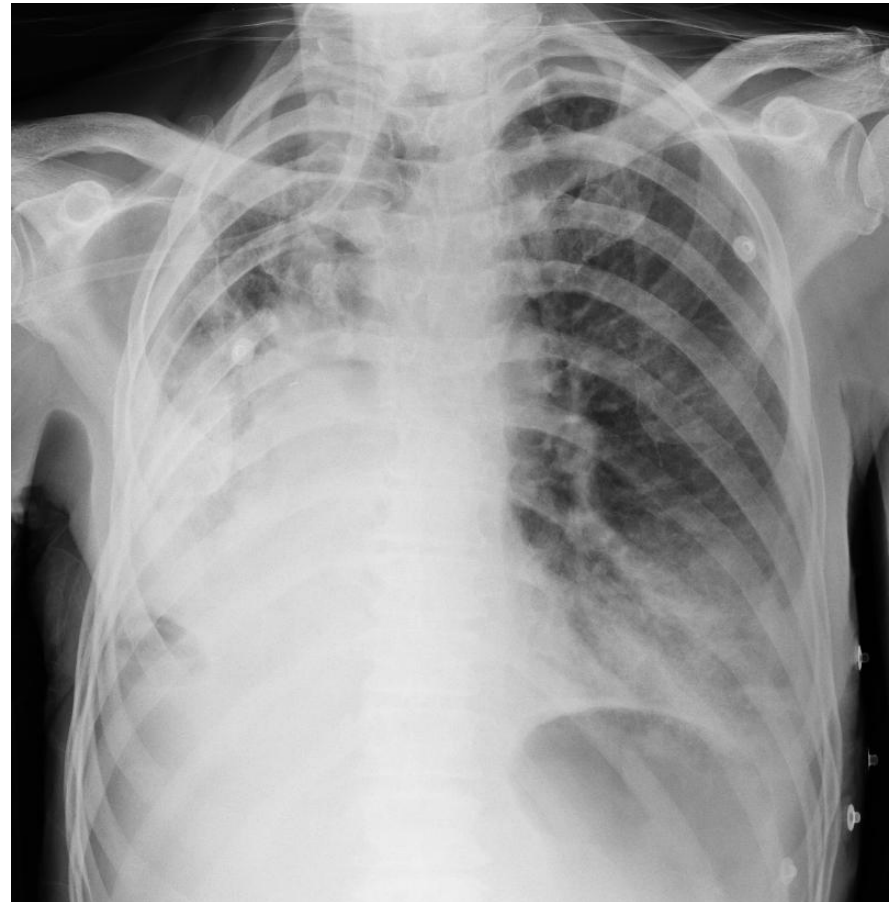


RESPIRATORY DISTRESS & CHEST TRAUMA

Basic Disaster First Aid

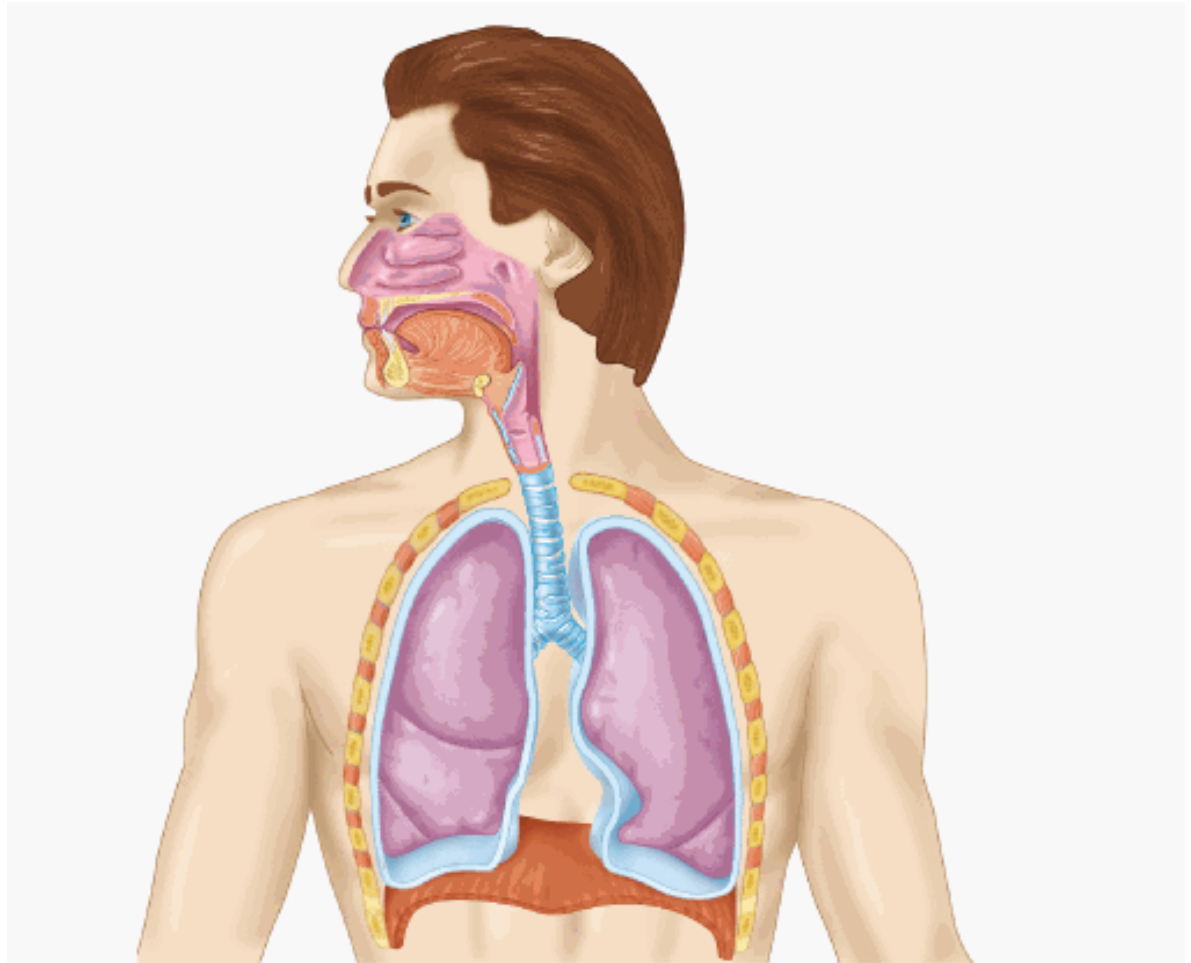
Lesson Objectives

- Describe anatomy and physiology of respiratory system
- Assess and manage chest trauma (rib fractures, pneumothorax, hemothorax)
- Assess and manage airway illnesses (viruses, asthma, anaphylaxis)
- Assess and manage respiratory distress



Anatomy and Physiology

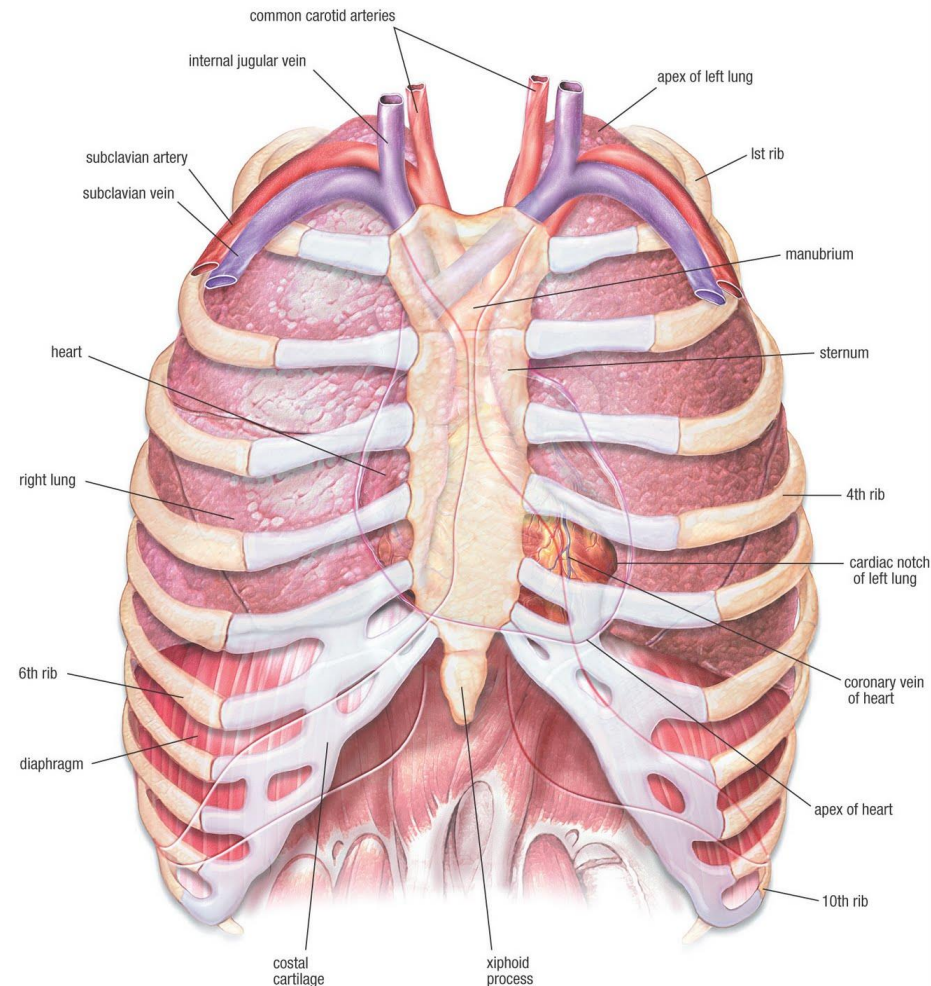
- Respiratory system includes
 - Air passages
 - Lungs
 - Chest wall (ribs)
 - Diaphragm



Anatomy and Physiology

- Chest bounded by collarbones and lower margin of rib cage
- Respiratory emergencies and caused by injury or illness
- Main chest structures
 - Lower airway
 - Lungs
 - Heart
 - Aorta, arteries, and veins

VISCERA OF THORAX (ANTERIOR VIEW)

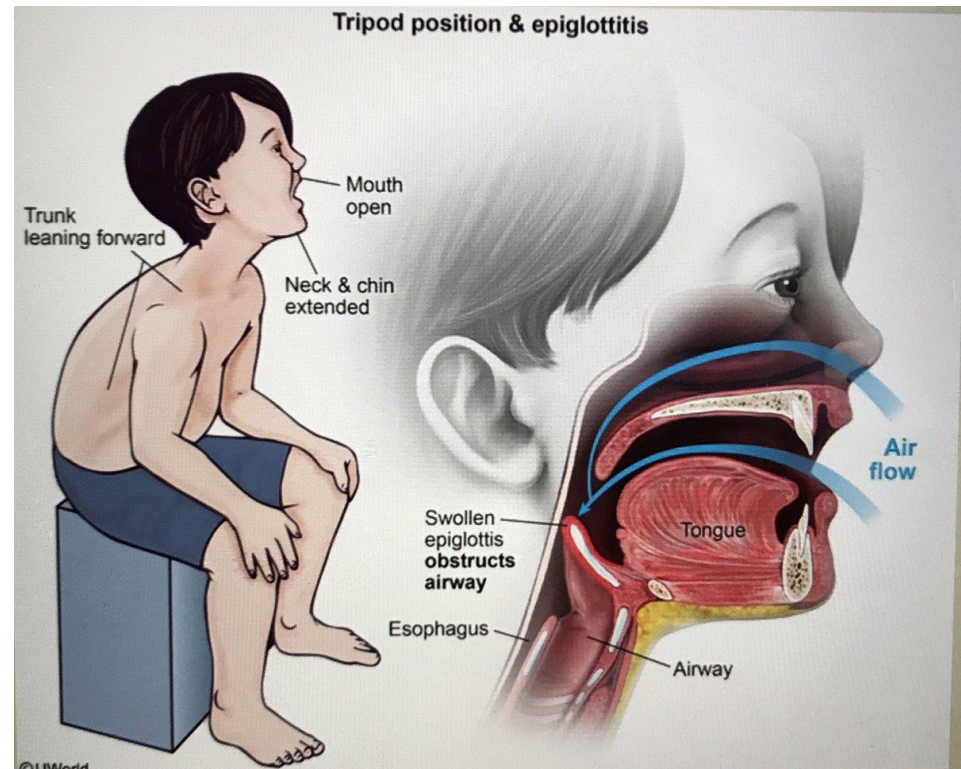


Respiratory Distress

- Patient in respiratory distress has trouble breathing and/or experiences shortness of breath
- Ranges from mild to life threatening
- Significant cause of morbidity and mortality
- Can create significant anxiety as patient's breathing challenged
- Caused by trauma or by illness
- Signs/Symptoms
 - Inability to speak in full sentences
 - Sitting up or "tripoding"
 - Rapid, sometimes shallow, breathing
 - Unilateral as opposed to bilateral chest movement
 - Anxiety
 - Cyanotic

Respiratory Distress – Patient Comfort

- No matter the cause, a patient in respiratory distress should be allowed to assume a position of comfort
- Rather than laying down, a patient may find breathing easier if sitting up
- A tripod position may be helpful (sitting up, hands or arms on knees, and leaning forward)



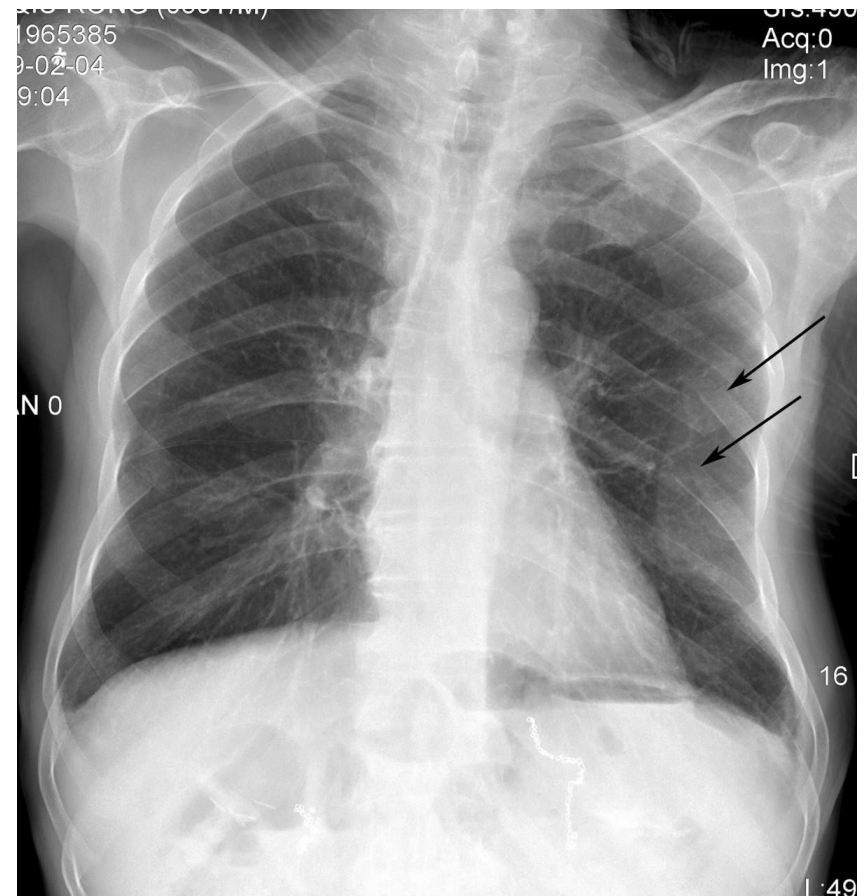
Chest Injury – Respiratory Distress

What To Do

- Serious injuries usually result of high-energy incidents
- Always consider MOI
- Keep airway open
- Help patient to a comfortable position
- Encourage deep breathing
- If breathing or coughing is painful from trauma, consider splinting affected area
- Keep warm
- **EVACUATE** if victim cannot speak in complete sentences, is cyanotic, or if condition worsens

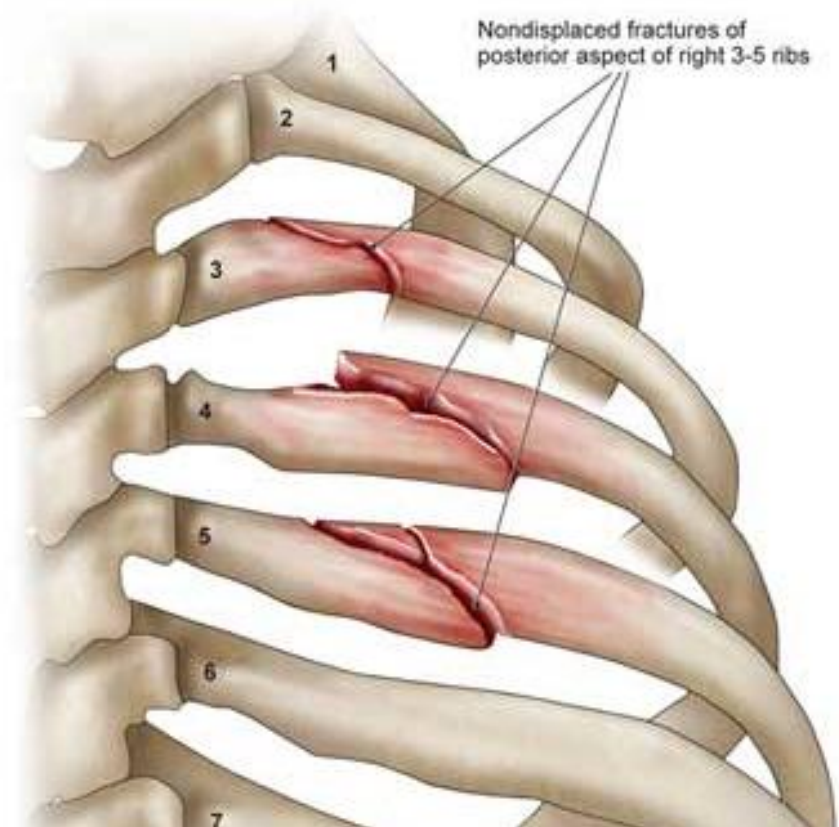
Chest Injury – Rib Fractures

- Takes significant MOI
- Can be isolated or associated with internal organ damage
- Painful, but little that can be done for ribs other than pain control
- Main concern is damage to underlying internal organs, and long-term to respiration



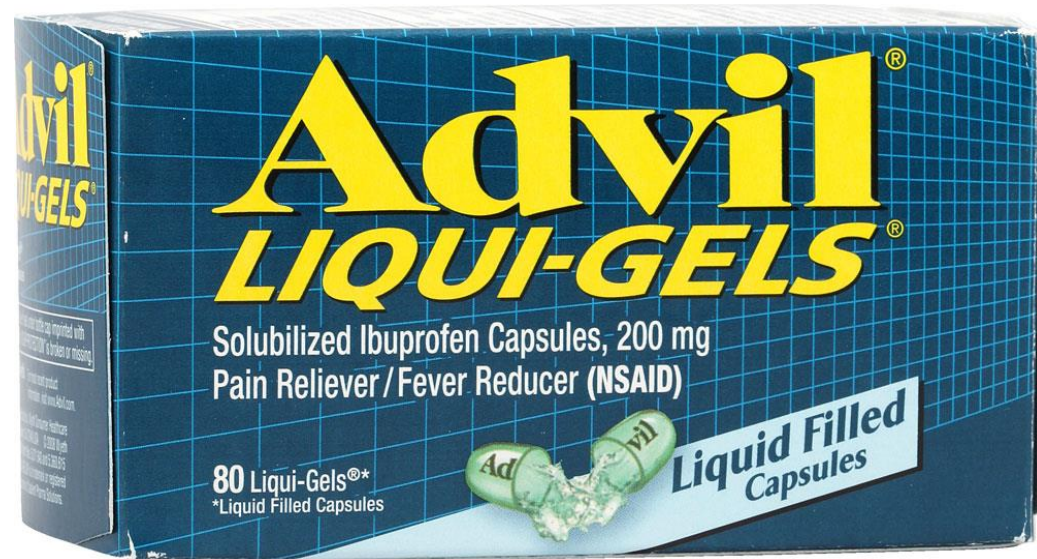
Rib Fractures – Signs & Symptoms

- Severe, localized chest pain
- Tenderness directly over ribs
- Pain in breathing, coughing, even sneezing or laughing
- Shortness of breath
- Cyanotic
- Coughing up blood or pink froth



Rib Fractures – What To Do

- Mainly supportive care
- Treat for pain
- Hold pillow or cushion over painful area
- Sleep on injured side with cushion underneath
- Can use tape splint over injured side
- In long run encourage deep breathing
- Evacuate if serious respiratory distress (cyanotic, unable to speak in full sentences, etc.)

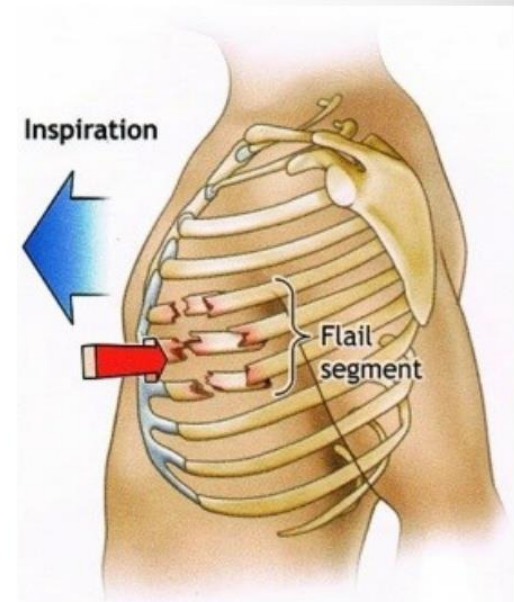


- Multiple adjacent ribs broken in multiple places resulting in segment of chest wall moving independently from main chest wall
- Takes very significant MOI, think underlying organ damage
- Will likely result in serious respiratory distress and need for evac

Flail Chest

Flail Chest - What is happening..?

- The flail segment will be pulled in with the decrease in pressure while the rest of the rib cage expands.

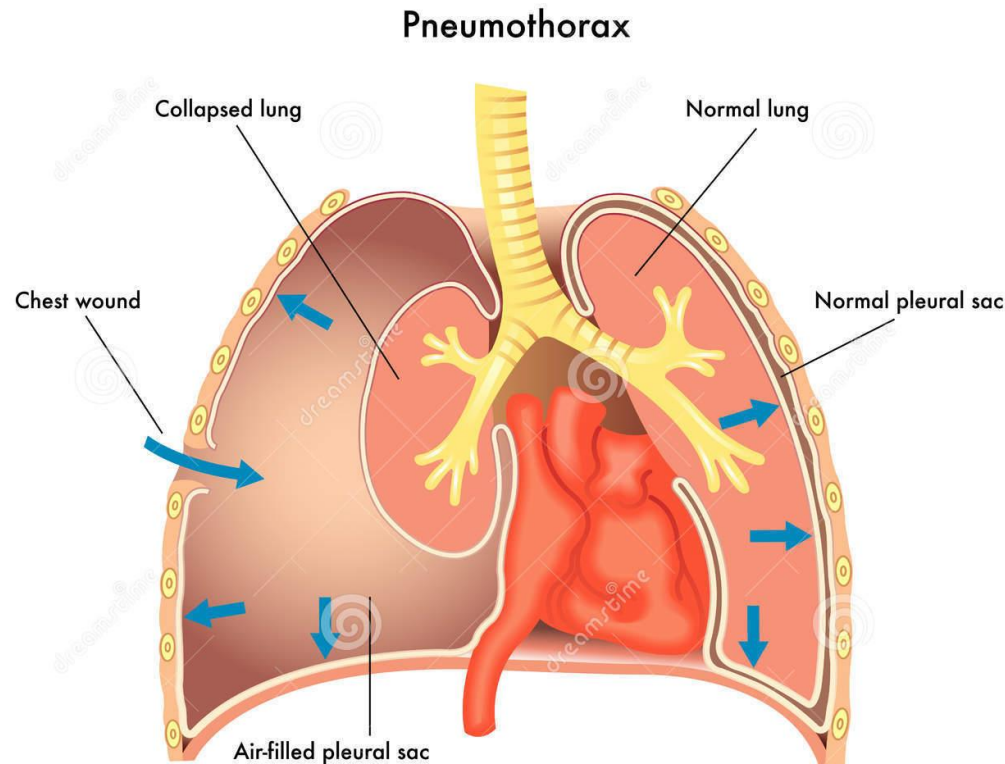


Pneumothorax

- Air fills pleural space, can collapse lung(s)
- Often caused by penetrating injury (gunshot or knife)
- Second most common chest trauma injury; ~50,000/year in US
- Can be life threatening

Pneumothorax – Signs/Symptoms

- Penetrating wound or significant MOI to chest wall
- Sucking chest wound (sound of air moving in/out of wound with breathing)
- Increasing respiratory rate
- Cyanosis
- Bulging veins in neck and/or face
- Shock



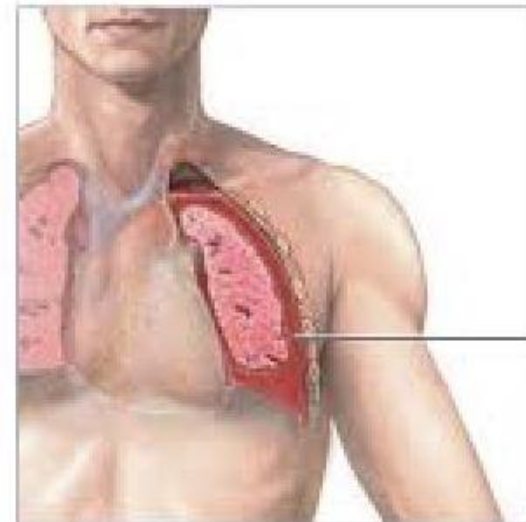
Pneumothorax -- What To Do:

- Find wound and cover with three or four-sided occlusive dressing
- If condition worsens, release a corner of dressing to allow escape of air with expiration
- Keep warm be prepared to treat for shock
- Emergency evacuation



Hemothorax

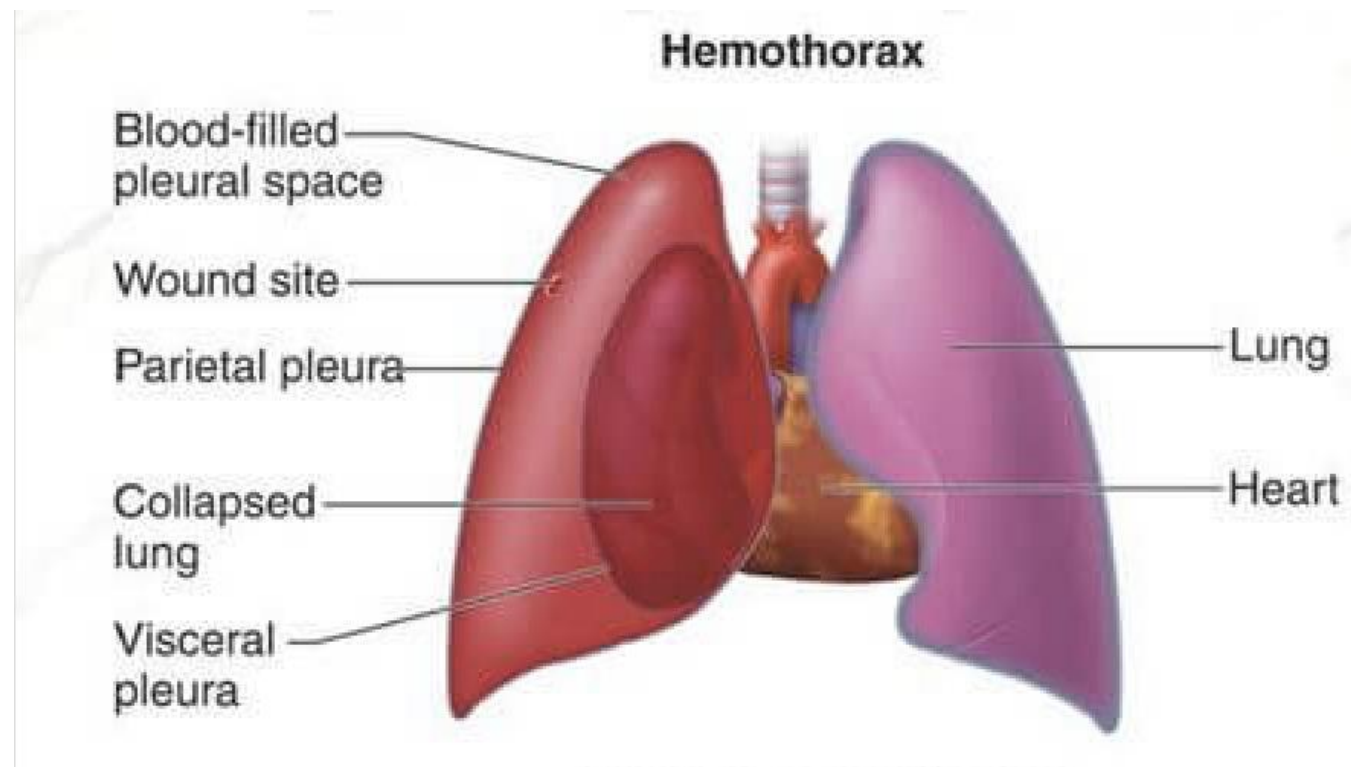
- Blood fills pleural space, displacing lung(s)
- 30-50% of patients with severe blunt chest injury and >70% of those with traumatic rib fractures have hemothorax
- Life threatening
- Almost 10% mortality rate overall (no doubt much higher in disasters)



Blood in pleural space

Hemothorax

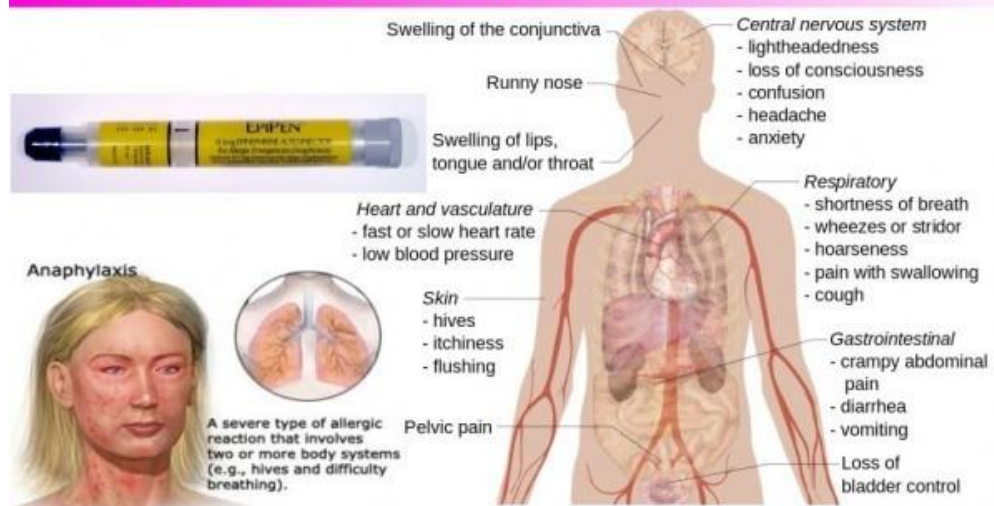
- In disasters usually caused by significant blunt trauma and/or penetrating wounds
- In urban areas more often caused by spontaneous pneumothorax
- Symptoms include increased respiratory and heart rate, cyanosis, bulging veins in neck and/or face
- Little can be done in field: treat for shock, emergency evacuation



Anaphylaxis - Overview

- Moderate to severe allergic reaction to medicine, foods, toxins (bees for example), latex, etc.
- Can occur relatively quickly (minutes)
- Most cases are more on the moderate side but anaphylaxis can be life-threatening
- Only one real treatment: epinephrine

Anaphylaxis & Severe Allergic Reactions



Anaphylaxis is like a full-body severe allergic reaction. Often you will hear wheezing before the person's face starts to swell. Tx with Epi-pen, Prednisone & Benadryl.

Anaphylaxis – Signs & Symptoms

- Common symptoms: weakness, dizziness, flushing, hives, swelling (especially of face), congestion, sneezing
- Severe symptoms: upper respiratory tract obstruction, hypotension, vascular collapse, gastrointestinal distress, cardiovascular arrhythmias, and/or arrest
- Common symptoms do not always precede severe ones
- In general, faster the onset, the more severe reaction



Anaphylaxis – Treatment

- Only one definitive treatment: epinephrine
- Usually administered with an auto-injector (EpiPen)
- Biggest mistake is not administering soon enough
- Auto-injector administered into thigh, through normal clothing, and held for 3 seconds



Form fist around EpiPen® and pull off
BLUE SAFETY RELEASE



Push **ORANGE** end hard into outer thigh
so it 'clicks' and hold for 10 seconds‡

‡After administration of EpiPen® Adrenaline Auto-Injector
always seek medical attention, call 999

Anaphylaxis – Treatment (cont)

- Second dose of epi may be necessary (16-36% of the time, depending on studies)
- Benadryl or steroids helpful as follow up
- If patient will allow, place on back, in position of comfort or recovery position, with lower extremities elevated
- All patients with anaphylaxis should be evacuated

Anaphylaxis – Treatment (cont)

- Pediatric auto-injectors are preferred for children, but if none available, better to give adult dosage than nothing
- Administration of epi to patient misdiagnosed with anaphylaxis will not cause significant issues
- Common side effects of epi are pallor, tremors, anxiety, palpitations, dizziness, headaches

Anaphylaxis – Epi Pens (cont)

- There is more than one dose of epi in EpiPens, but accessing tricky and should be practiced before an emergency need
- Auto-injectors should be kept from extremes of heat and cold, but retain efficacy after repeated freezing
- Expired auto-injectors largely retain efficacy



Benign hyperventilation

- Usually caused by emotional trigger
- Symptoms
 - Dizziness or light-headedness
 - Increasing shortness of breath
 - Numbness, coldness, and tingling of the mouth, hands and feet
 - Chest tightness or discomfort
- What to do:
 - Prevent head striking hard/sharp objects if patient faints
 - Reassure victim
 - Remove from cause of anxiety
 - Encourage slow, regular breathing
 - If hyperventilation persists, consider other causes; plan to evacuate
- Also called Acute Stress Reaction

Respiratory Distress & Chest Trauma Summary

- Patient having breathing difficulty should be allowed to assume position of comfort (often sitting up or “tripoding”)
- Rib fractures common and serious outcome of major trauma but treatment largely pain and supportive care
- Pneumothorax, when air fills pleural sac, can be life-threatening; treated with three-sided occlusive dressing
- Hemothorax, when blood fills pleural sac, can be life-threatening; requires evacuation
- Asthma common; treatment administration of meds and supportive care
- Anaphylaxis common in general, though wilderness events and fatalities rare; treatment is epinephrine and evacuation

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