

# Soft Tissue Injuries ("STI")

\*\*\* CME Version \*\*\*

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# Remember!

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- Before you treat a STI
  - Scene safety
  - Initial Assessment!
    - Treat ABCs
    - ...



# Types of STI

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- Due to musculoskeletal injuries
- Injuries to ST itself



## STI includes injuries to...

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- Skin
- Fatty (adipose) tissue
- Muscle
- Blood Vessels
- Fibrous tissue
  - Tendons, ligaments
- Nerves



## STI includes injuries to... -- 2

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- Glands
- Membranes that line organs
  - Visceral
    - Lines the organ itself
  - Parietal
    - Lines the cavity containing the organ
    - **Contain many sensory nerve endings**
    - **Severe pain!**



# State Exam Goodies

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- What is the largest organ in the body?  
■ ***The Skin***
  
- What is the largest ***internal*** organ?  
■ ***The liver***



# Wound types

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- **Closed wounds**

- Wounds to internal organs
- No skin breakage

- **Contusions**

- **Bruises** – pain, swelling, discoloration
- Caused by damage and rupture to blood vessels
- Can result in a *hematoma* at the injury site



# Hematoma

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- Collection of blood at an injury site
- Usually involves larger amounts of blood and tissue damage than contusions
- Blood loss can approach one liter
- ***Why is this a problem?***



# Contusion



# Hematoma





# Crush injury

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- Rupture of an internal organ
- **Significant risk due to:**
  - Blood loss
  - Leakage of organ contents



## S/S vs. potential injury -- 1

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- **Hematoma over injury site**
- Possible internal organ damage underneath
  - Consider potential of internal bleeding



## S/S vs. potential injury -- 2

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- **Swelling or deformity**
- Fracture?
  - Check for distal "PMS"



## S/S vs. potential injury -- 3

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- **Bruise in the head and neck region**
- C-spine or brain injury?
  - **Look for diminishing LOC**
  - **Check pupillary reaction**



## S/S vs. potential injury -- 4

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- **Bruises in the trunk or rib area**
- Chest injury?
  - Broken ribs
  - Kidney injury (rare)
  - **Look for S/S of SOB**



## S/S vs. potential injury -- 5

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- Bruises in abdominal area
- Injury to abdominal organs?
  - Often an urgent emergency
  - **Look for S/S of shock**
  - **Person can “bleed out” quickly**
    - **Especially in liver and spleen injuries**





# Closed wounds -- Treatment

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- **ABCs**
- Care for shock
  - Take advantage of the **compensated** shock period
- Splint extremities
  - Prevent further loss of blood from bone fragments



# Closed wounds Treatment -- 2

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- **Monitor airway** for
  - Vomiting
  - blood
  - Suction "PRN"
- ***Continuous patient monitoring!***



# Open wounds

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- Skin is broken



# Types of open wounds

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- Abrasions
- Lacerations ("cut")
- Puncture
- Penetrating
- Perforating
- Avulsion
- Amputation



# Abrasions

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- Simple scrapes and scratches
- Damages outer layer of skin only
- **Danger:**
  - Infection

# Abrasion

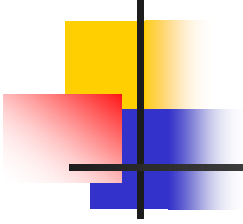




# lacerations

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- Smooth ("incision") vs. jagged
- **Dangers:**
  - Loss of blood
  - Loss of function
    - E.g. nerve or tendon damage
  - infection







# Punctures

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- Skin is pierced by a pointed object
- Blood loss varies
- **Danger:**
  - Infection

# Puncture





# Penetrating

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- Can be deep or superficial
- Entry wound only



# Perforating

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- Creates an entrance **and** exit wound
- E.g. gunshot



# Avulsion

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- Flaps of skin/tissue are torn loose
  - E.g. earlobe
- May also be known as a “degloving injury”
  - Typical of farm implements injury
- **If possible, try to replace avulsed portion back in original position**
  - Maintain blood supply

# Avulsion





# Amputation

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- Limb torn off body
- Can be:
  - Complete amputation
  - Partial amputation



# Open wounds - treatment

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- **ABCs**
- **Expose wound**
  - **Remove clothing – or you will miss injuries**
- Clean the wound of **large objects**
  - Using large sterile dressings
- Control bleeding
  - Direct pressure and elevation
  - Pressure points PRN





# Open wounds – treatment -- 2

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- Care for shock
  - O<sub>2</sub> and positioning
- Prevent further contamination
  - Sterile **dressings**
- **Bandage** dressing in place
- Reassure patient
  - **"PFA"**
- **Transport**
  - **Except for the most minor wounds**



# Special Care Situations

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- Punctures
- Impaled objects
- Amputations
- Nosebleeds (epistaxis)
- Neck wounds
- Chest wounds



# Punctures

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- Can be serious due to unseen injuries to internal injuries
- Reassure patient
- **Search for an exit wound**
- Assess the need for ALS
- Spinal immobilization when neck and torso involved
- Take object to ER if available



# Impaled objects

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What caused the injury still remains in the patient and is visible

- ***Do not remove the object!***
- Expose the area
- Control bleeding
- **Stabilize object with large bulky dressings**
  - Holds object in place
  - Prevents movement and more damage



## Impaled objects -- 2

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- **If in cheek:**

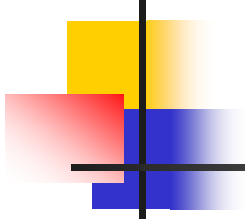
- May be/cause an airway problem
- If both sides are visible
  - Carefully remove object
    - **In the direction it entered**
- Position head for drainage
- **Be prepared to suction**
- If in a deeper structure, stabilize

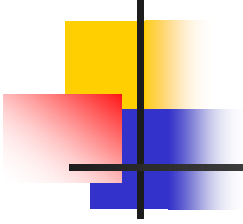


## Impaled objects -- 3

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- **If in the eye:**
  - Stabilize using a disposable cup
    - Tape in place
  - Cover the other eye
    - Prevents sympathetic motion









# Amputations

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- Often “self sealing”
- Pressure dressing over the “stump”
- Pressure points PRN
- **Never complete a partial amputation!**
  - *Wrap part in dry sterile dressing*
  - *Place in plastic bag*
  - *Place bag on ice/ice water*

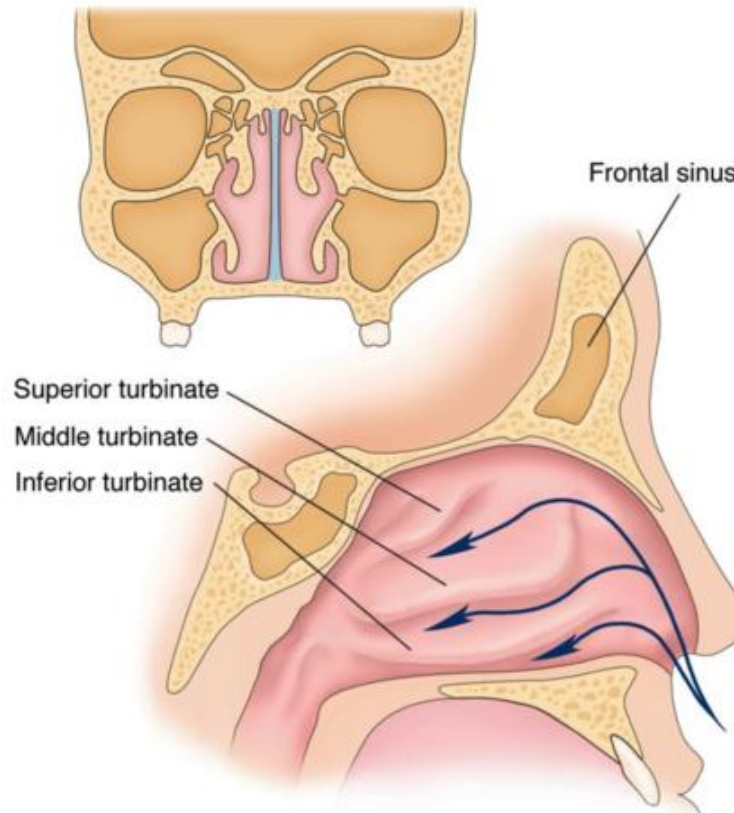


# Nosebleed

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- **Consider trauma vs. medical cause**
- Head upright
- Pressure on **fleshy** portion of nose
- Ice along bridge of nose
- Folded gauze inside upper lip
- **In head trauma:**
  - Light pressure
  - **Consider the possibility of CSF leakage**

# Nasal Structure





# Neck wounds

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- **Major risk: Air “embolus” entering the vascular system passing to the heart causing rapid cardiac arrest**
- Treatment is aimed at:
  - Controlling bleeding
  - Preventing air from entering blood vessel
- Gloved hand until bulky dressing firmly in place
- Positioning?



# Chest injuries

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- Can be due blunt, penetrating or compression mechanism
- Open (“Sucking”) chest wounds (“SCW”) present with **severe** difficulty breathing
- Treatment involves:
  - Maintain ABCs
  - Seal the SCW with an “occlusive” dressing wider than the wound
    - Seal on 3 vs. 4 sides?
  - Treat for shock PRN



# Serious Complications

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- Pneumothorax
  - Air in the pleural (lung) cavity
  - Opened vs. closed
- Hemothorax
  - Blood in the pleural cavity
- Hemopneumothorax
  - Air and blood in the pleural cavity



# Serious Complications -- 2

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- **Tension pneumothorax**
  - Life threatening accumulation of air in the pleural cavity that can not escape
  - From a closed pneumothorax
  - After sealing a SCW
- Pericardial tamponade
  - Life threatening accumulation of blood in the pericardial sack
  - Needs a trauma surgeon quickly



## Serious Complications -- 3

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- Traumatic asphyxia
- From blunt chest trauma
- S/S include:
  - Severe SOB
  - Jugular vein distention ("JVD")
  - Bloodshot eyes
  - Purple facial color



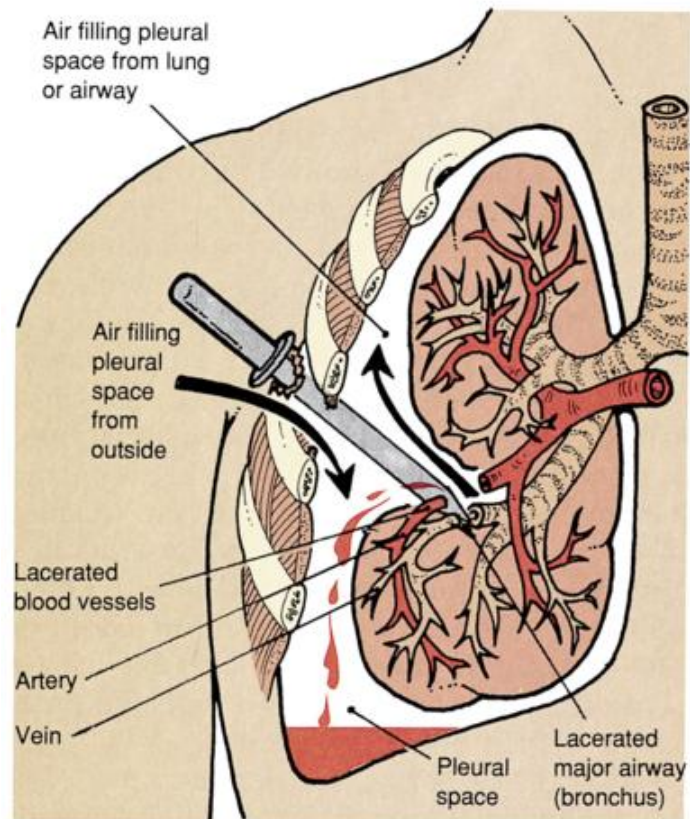


## Serious Complications -- 4

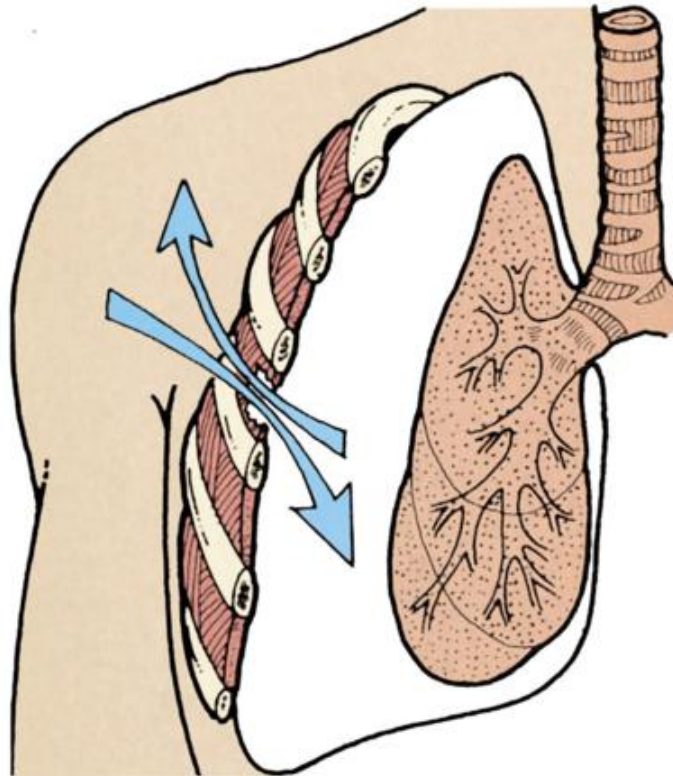
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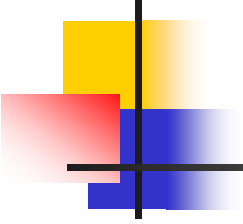
- **Flail Chest** (“Stove chest”)
  - More than 2 ribs broken in more than 2 places
  - Hallmark: Paradoxical chest motion
  - **Stabilize flail segments with “bulky dressing” or pillow**

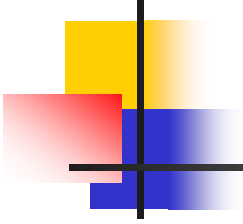
# Penetrating Chest Wound

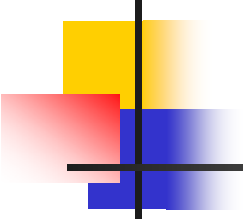


# Sucking Chest Wound



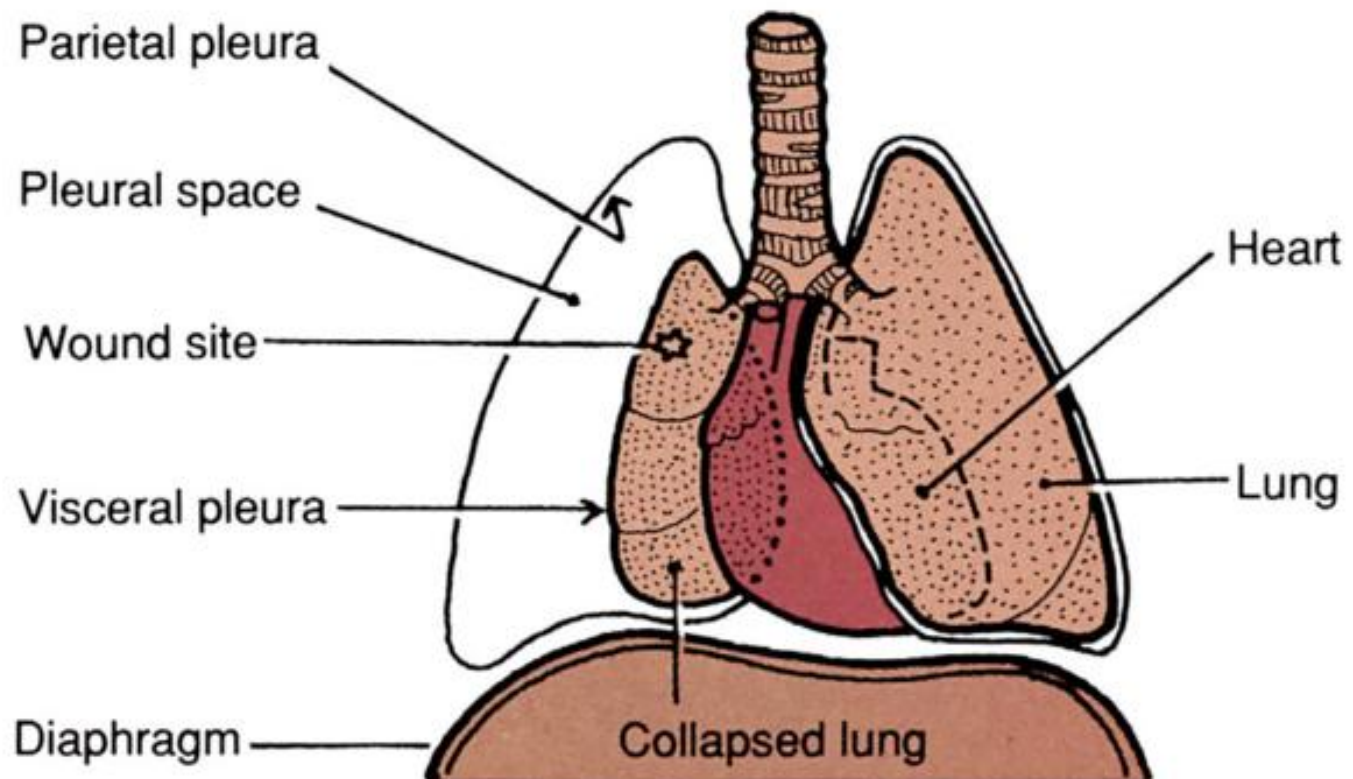




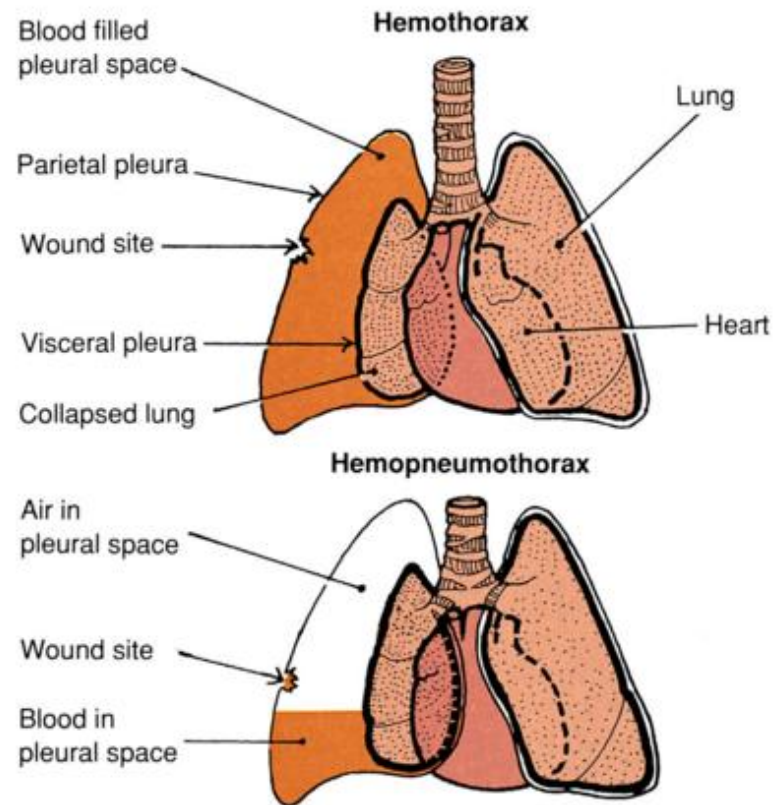




# Pneumothorax

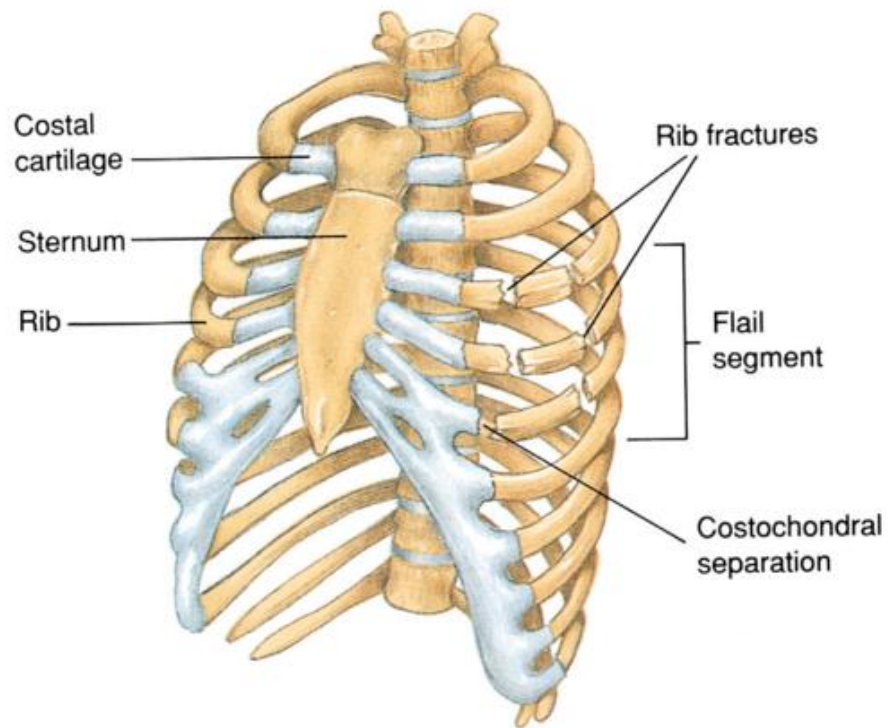


# Pneumohemothorax

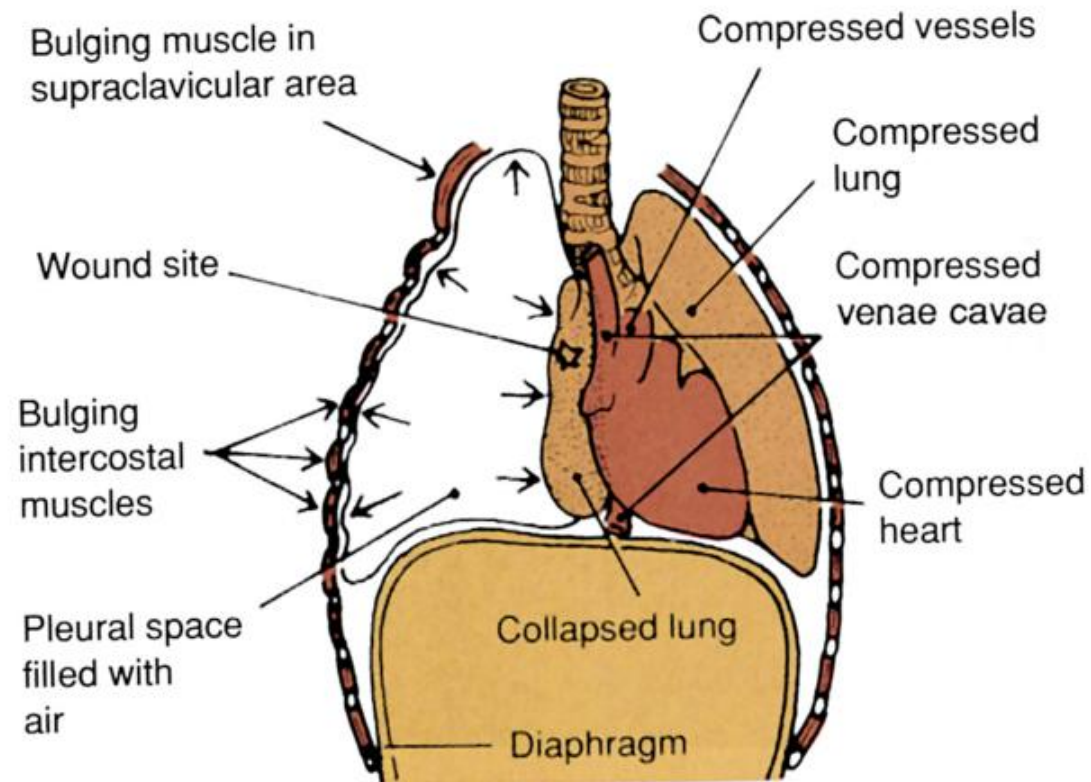




# Flail Chest



# Tension Pneumothorax





# A dose of reality

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In all of the serious complication cases there is **little or nothing** that you are able to do to improve the patient!

- Rapid transport is highest priority
- Maintain ABCs
- O<sub>2</sub>, BVM as needed
- Treat for shock PRN



# Abdominal injuries

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- Opened or closed
- Eviscerated organs
  - Spilling of abdominal organs outside the body
  - **Never try to push organs back in**
  - Treatment involves:
    - **Moist saline dressing**
    - Then an occlusive dressing
    - Then a bulky sterile dressing
    - ABCs, O<sub>2</sub>, treat for shock PRN

# Eviscerated intestine



# Treating an eviscerated organ





# Abdominal injuries -- 2

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- Blunt abdominal trauma
  - Good to know abdominal anatomy
- **Dangers:**
  - Shock
  - Spillage of abdominal contents
  - Infection
- **Patient may be in excruciating pain**
- Treat with: ABCs, O<sub>2</sub>, treat for shock PRN
- **Position of comfort** – usually supine with knees bent