



Soft Tissue Injuries (“STI”)

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Remember!

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



Types of STI

- Due to musculoskeletal injuries
- Injuries to STI itself



STI includes injuries to...

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



STI includes injuries to... -- 2

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



State Exam Goodies

- What is the largest organ in the body?
- What is the largest *internal* organ?



Skin – major functions

- **Protection**
 - From micro-organisms
 - From outside forces
- **Water balance**
 - Keeps water in
 - Prevents unnecessary water out
- **Temperature regulation**
 - Allows sweating
 - Allows cooling of blood near skin surface



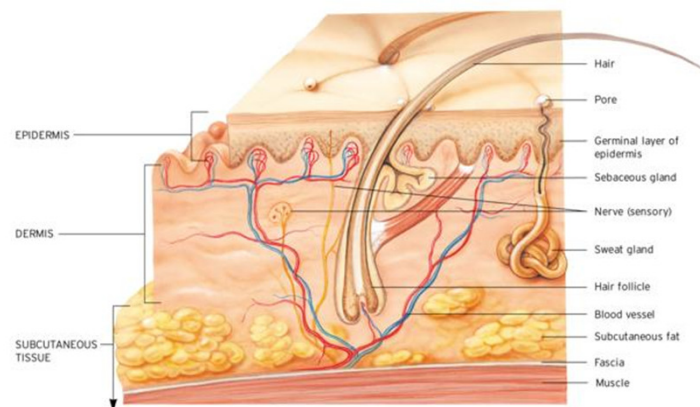
Skin – major functions -- 2

- **Excretion of mineral wastes**
 - Significant in dehydrated patients
 - Losses of critical minerals can cause major organ dysfunction:
 - E.g. potassium and calcium imbalances can cause cardiac problems
 - E.g. sodium imbalances can cause problems with water retention

Skin composition

- **Epidermis**
 - Outer layer – dead cells
 - Pigment cells
- **Dermis**
 - Blood vessels
 - Nerves
 - Sweat and oil glands
 - Hair follicles
- **Subcutaneous layer**
 - Fat
 - Purposes:
 - Shock absorption
 - insulation

Skin layers





Wound types

- **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

- 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

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



Closed wounds -- Treatment

- **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

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



Open wounds

- Skin is broken



Types of open wounds

- Abrasions
- Lacerations (“cut”)
- Puncture
- Penetrating
- Perforating
- Avulsion
- amputation



Abrasions

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

Abrasion



Lacerations

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



Punctures

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

Puncture



Penetrating

- Can be deep or superficial
- Entry wound only



Perforating

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



Avulsion

- 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

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



Open wounds - treatment

- **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 pressure bandage
 - Tourniquet PRN



Open wounds – treatment -- 2

- Care for shock
 - O₂ and positioning
- Prevent further contamination
 - Sterile **dressings**
- **Bandage** dressing in place
- Reassure patient
 - “PFA”
- **Transport**
 - **Except for the most minor wounds**



Special Care Situations

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



Punctures

- 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

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

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

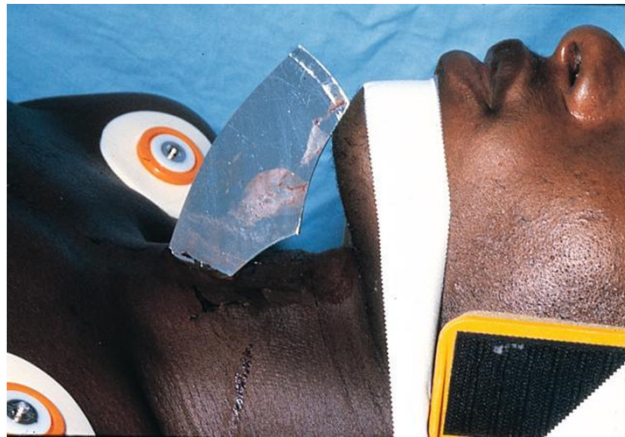


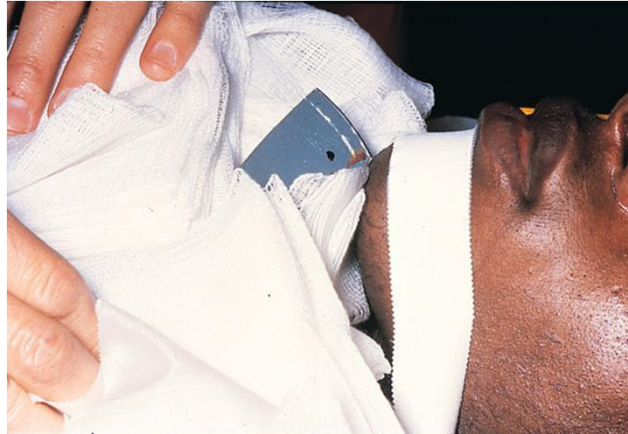
Impaled objects -- 2

- **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

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





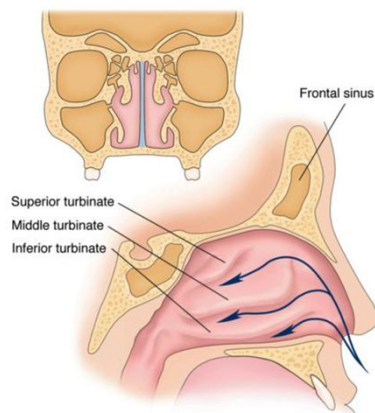
Amputations

- 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

- **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

- **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

- 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

- 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

- **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

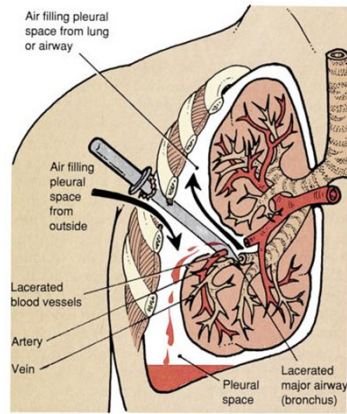
- Traumatic asphyxia
 - From blunt chest trauma
- S/S include:
 - Severe SOB
 - Jugular vein distention (“JVD”)
 - Bloodshot eyes
 - Purple facial color



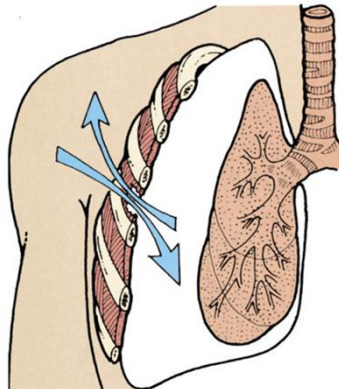
Serious Complications -- 4

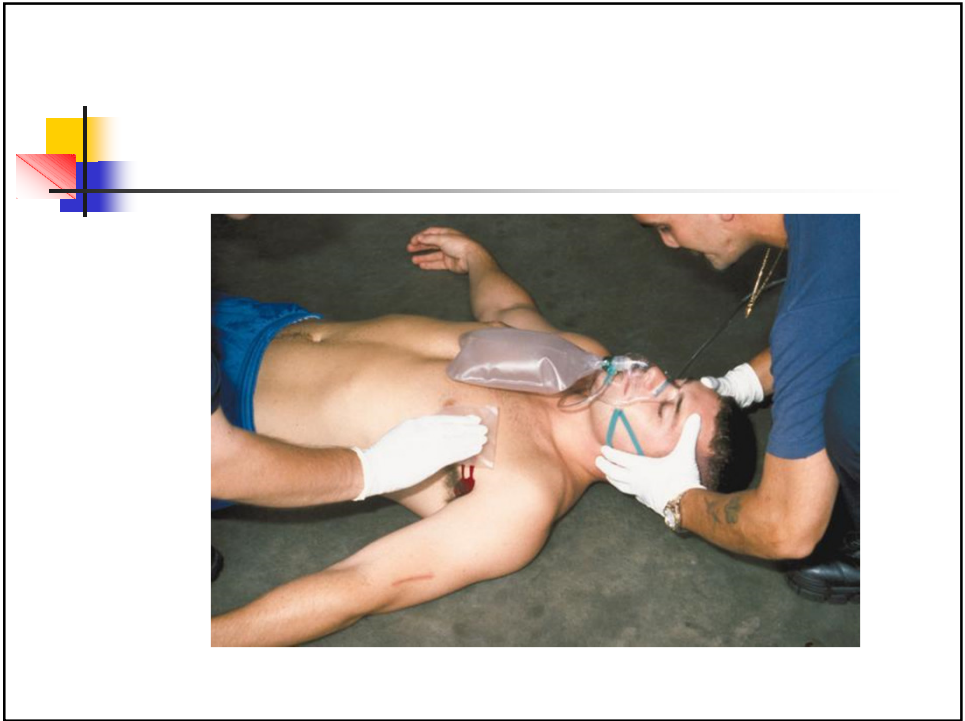
- **Flail Chest** (“Stove chest”)
 - More than 2 ribs broken in more than 2 places
 - Hallmark: Paradoxical chest motion
 - → **OLD Protocol: Stabilize flail segments with “bulky dressing” or pillow**
 - → **New Protocol:**
 - Oxygen
 - Ventilation PRN
 - Rapid Transport
 - ALS for Pain Control

Penetrating Chest Wound



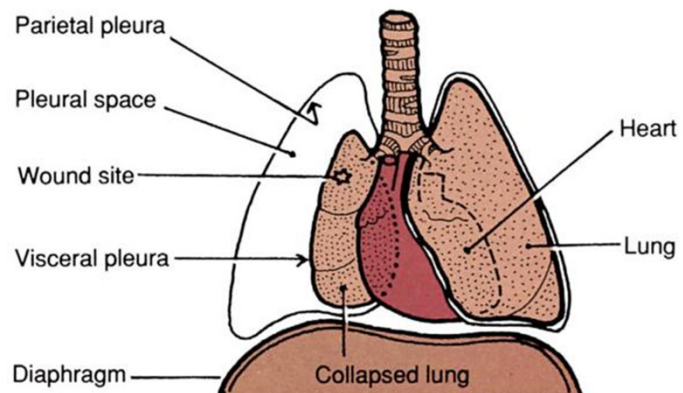
Sucking Chest Wound



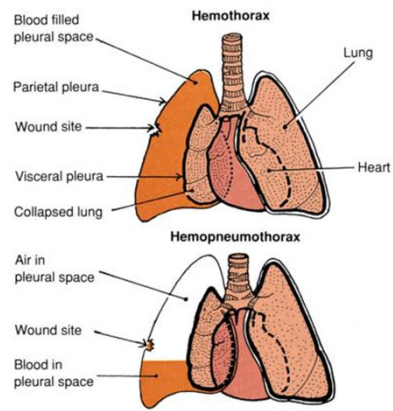




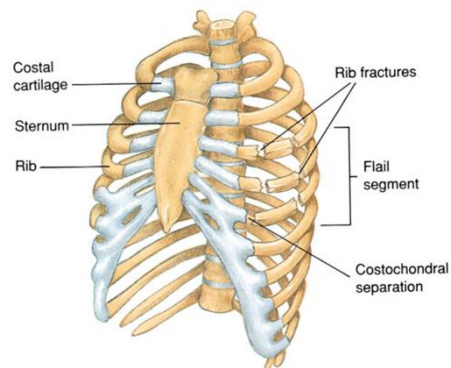
Pneumothorax



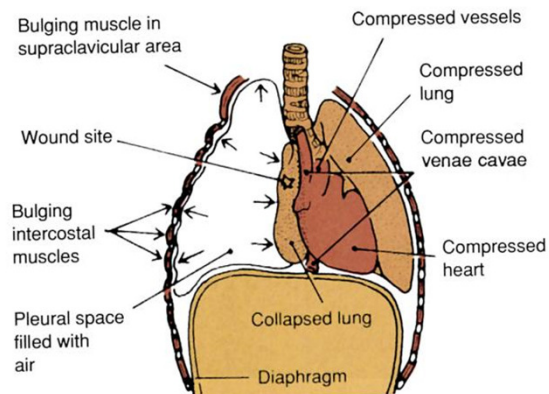
Pneumothorax



Flail Chest



Tension Pneumothorax



A dose of reality

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
- O₂, BVM as needed
- Treat for shock PRN

Abdominal injuries

- 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, O₂, treat for shock PRN

Eviscerated intestine



Treating an eviscerated organ



Abdominal injuries -- 2

- Blunt abdominal trauma
 - Good to know abdominal anatomy
- **Dangers:**
 - Shock
 - Spillage of abdominal contents
 - Infection
- **Patient may be in excruciating pain**
- Treat with: ABCs, O₂, treat for shock PRN
- **Position of comfort** – usually supine with knees bent