

# CERT

## Disaster Medical Operations Part 1



Unit 3

# First Aid

- ◆ Airways
- ◆ Bleeding/Wound Care
- ◆ Shock
- ◆ Burns
- ◆ Fractures, dislocations, splinting
- ◆ Head-To-Toe Assessment





# Why Disaster Medical Ops?

- ◆ Need for CERT members to learn disaster medical operations is based on two assumptions:
  - Number of victims could exceed local capacity for treatment
  - Survivors will assist others
    - They will do whatever they know how to do
    - They need to know lifesaving first aid or post-disaster survival techniques



## 3 Phases of Death from Trauma

- ◆ Phase 1 – Death within minutes due to overwhelming injuries to major organs
- ◆ Phase 2 – Death within hours due to excessive bleeding
- ◆ Phase 3 – Death in days/weeks due to infection or multiple organ failure – complications from an injury

Peter Safer's research after earthquakes in Chile, Peru, and Italy indicated that more than 40 percent of disaster victims in the second and third phases of death from trauma could be saved by providing simple medical care.



# Treatment of Life-Threatening Conditions

## The “Killers”:

- ◆ Airway obstruction
- ◆ Excessive bleeding
- ◆ Shock

## First priority of medical operations:

- ◆ Open airway
- ◆ Control excessive bleeding
- ◆ Treat for shock

# START

- ◆ SStart = Simple Triage
  - Victims sorted based on priority of treatment
- ◆ stART = And Rapid Treatment
  - Rapid treatment of injuries assessed and prioritized in first phase

Greatest good for the greatest number.

# Public Health Considerations

- ◆ Maintain proper hygiene
- ◆ Maintain proper sanitation

Main Goal: Prevent the spread of disease!





# Steps to Maintain Hygiene

- ◆ Wash hands frequently using soap and water
  - OR use alcohol based hand sanitizer
- ◆ Wear latex gloves; change or disinfect after each patient
- ◆ Wear a mask and goggles
- ◆ Keep dressings sterile
- ◆ Avoid contact with body fluids
  - “If it is warm, wet, and not yours, **DON'T TOUCH IT!!!**”



# Water Sanitation Methods

- ◆ Boil water for 1 minute
- ◆ Water purification tablets
- ◆ Non-perfumed liquid bleach
  - 8 drops/gal of water
  - 16 drops/gal if water is cloudy
  - Let stand for 30 minutes before use



# DEMONSTRATION

# How to Approach a Victim

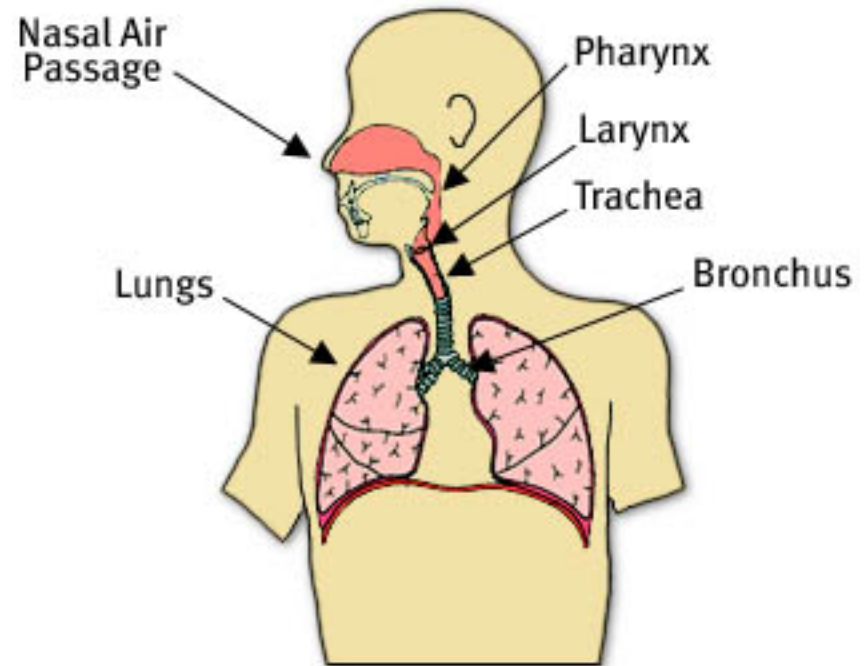
- ◆ Be sure victim can see you
- ◆ Identify yourself
  - Your name and name of your organization
- ◆ Request permission to treat, if possible
- ◆ Respect cultural differences



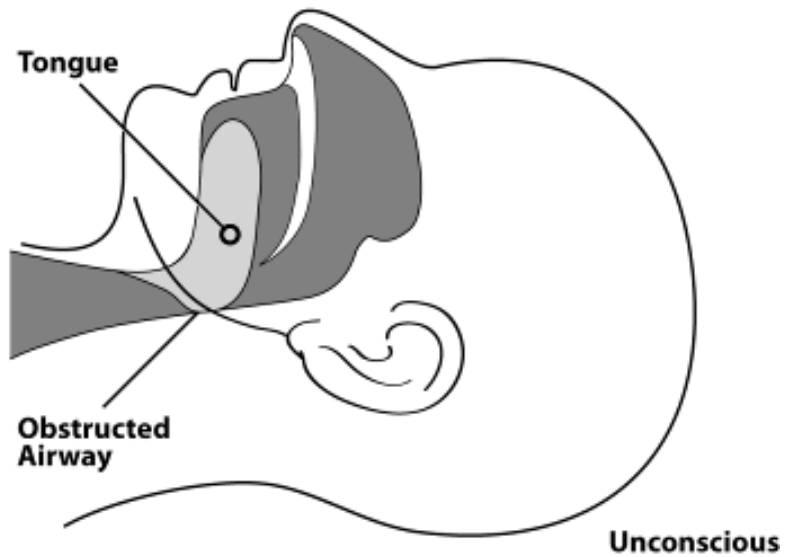
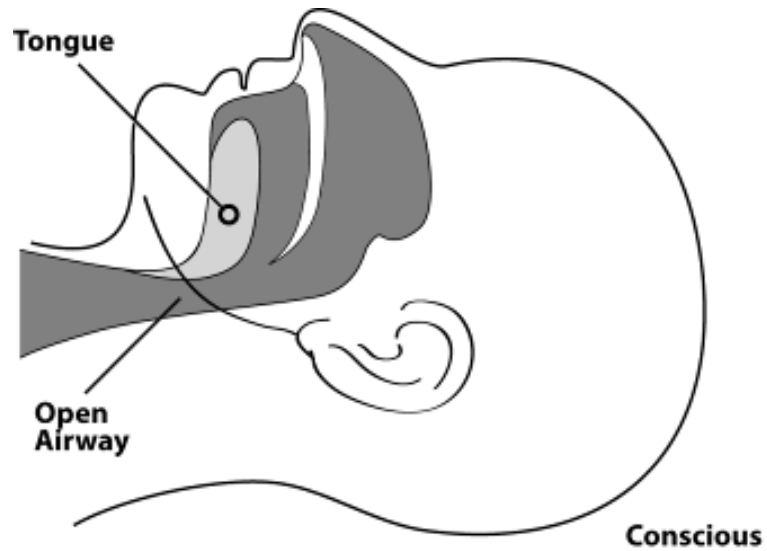
# Airway Obstruction

Components of a respiratory system:

- ◆ Lung
- ◆ Bronchus
- ◆ Larynx
- ◆ Pharynx
- ◆ Nasal Air Passage
- ◆ Trachea



# Open Versus Obstructed Airway



# Opening the Airway

## Head-Tilt/Chin-Lift



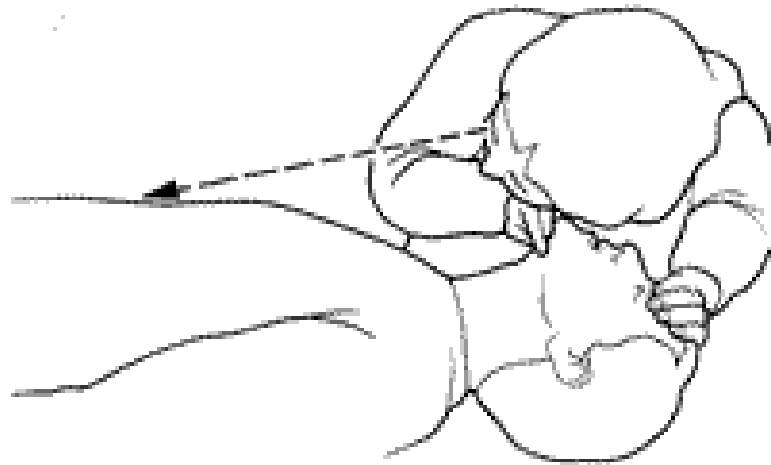
# Opening the Airway

Jaw Thrust



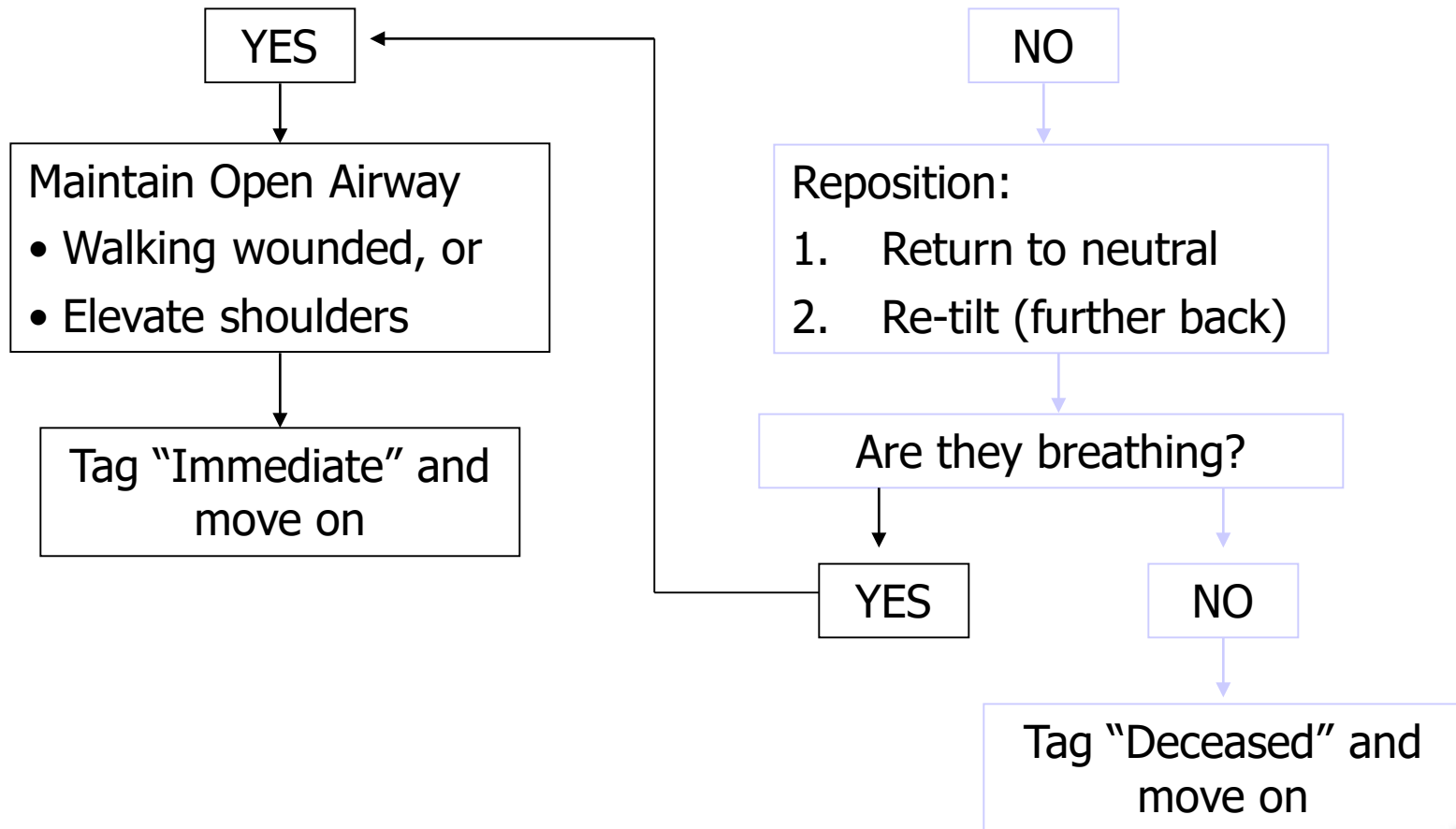
# Look, Listen and Feel

- ◆ “Look” for the chest to rise
- ◆ “Listen” for air exchange
- ◆ “Feel” for air exchange





# Triage - Are they breathing?



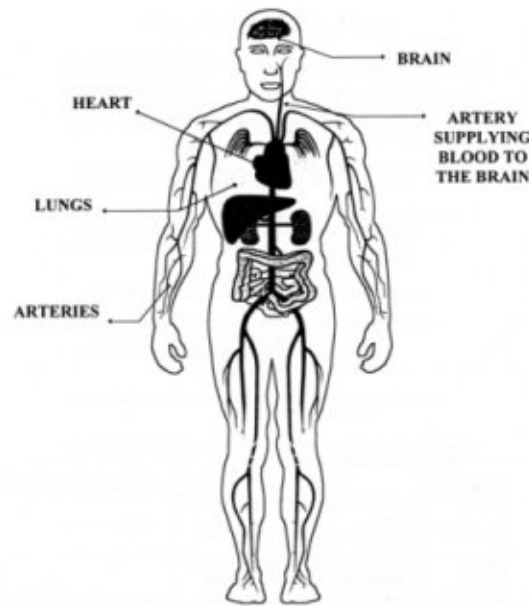
Any questions?



# Circulatory System

## Main Function

- ◆ Transport oxygen to cells





# Shock

- ◆ Result of ineffective circulation of the blood
- ◆ Primary cause in a disaster: blood loss
- ◆ Remaining in shock will result in Cell, Tissue and Organ death
- ◆ Important to continually re-evaluate and monitor victims for symptoms of shock

# Recognizing Shock

- ◆ Rapid Breathing
  - >30 breaths per minute (very shallow)
- ◆ Inadequate circulation
  - Capillary blanch >2 seconds
- ◆ Mental Status
  - Unconscious, or
  - Unable to follow simple command, “squeeze my hand”

Symptoms of shock are easily missed... pay careful attention to your patient!



# Treating for Shock

- ◆ Lay victim on back
  - Maintain open airway
- ◆ Elevate feet
- ◆ Control bleeding
- ◆ Maintain body temperature

# Treating for Shock

## BODY POSITIONING FOR SHOCK



ALL shock victims, except for.....



Head injury



Difficulty Breathing



Unconscious: must be left alone or vomiting



Spinal Cord injury/  
Unsure/leg fracture



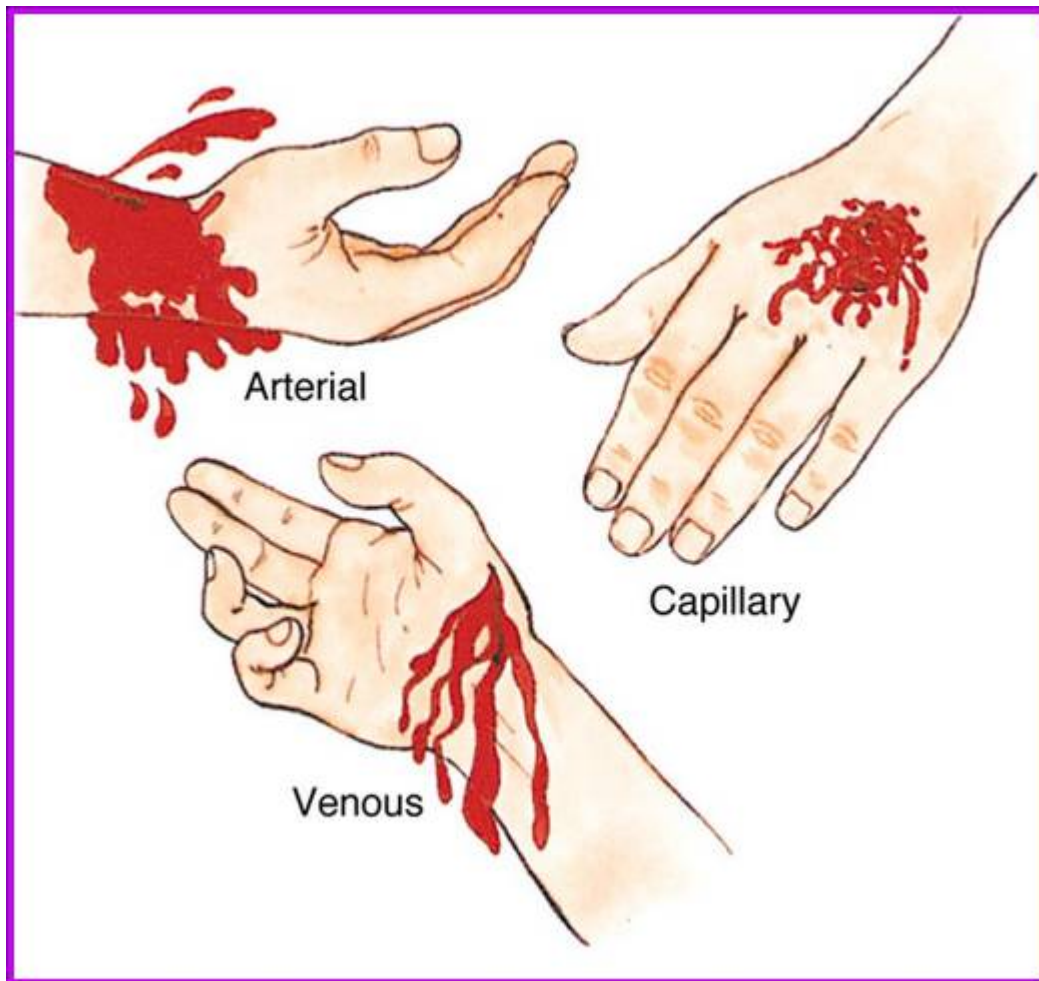
# Excessive Bleeding

## Three Types of Bleeding:

- ◆ Arterial – spurting
- ◆ Venous – flowing
- ◆ Capillary – oozing



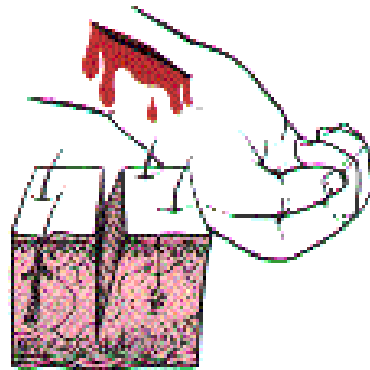
## Types of Bleeding - 2



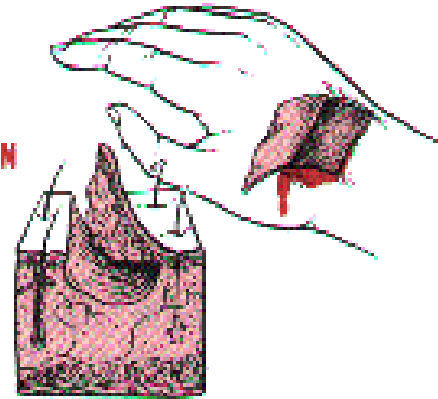
# Wound Classification

## CLASSIFICATION OF OPEN WOUNDS

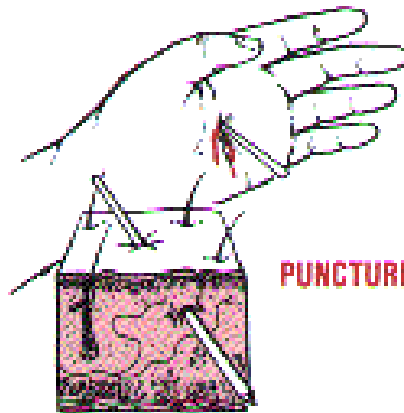
**INCISION**



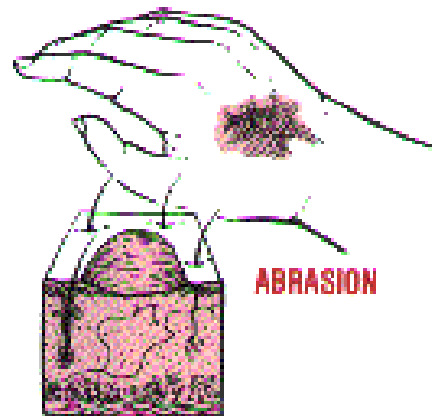
**AVULSION**



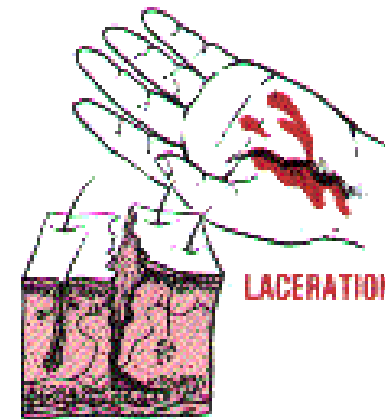
**PUNCTURE**



**ABRASION**



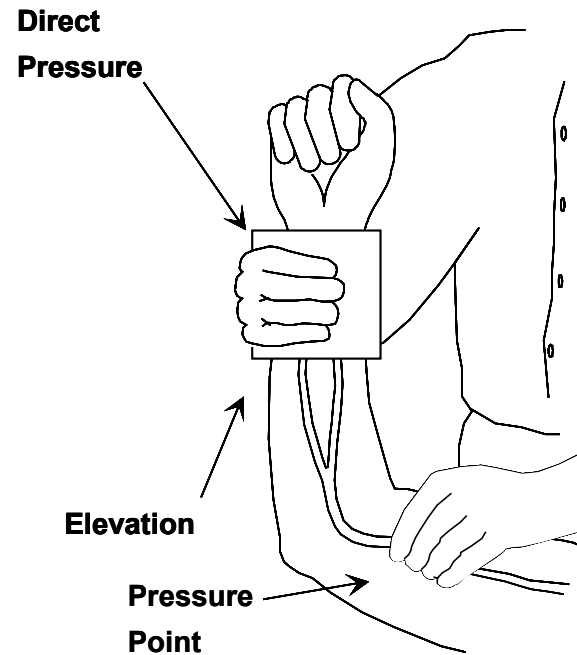
**LACERATION**



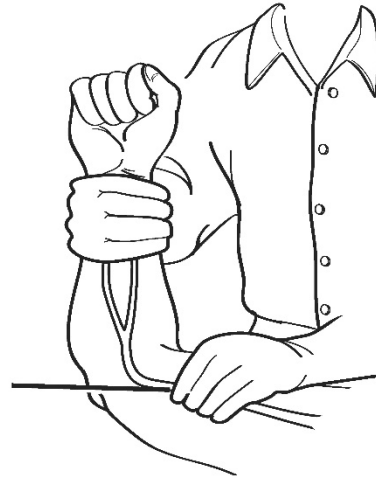
# Controlling Bleeding

## 3 Main Methods to Control Bleeding:

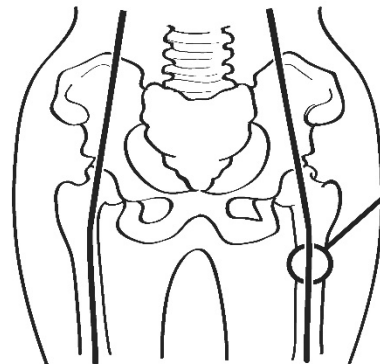
- ◆ Direct Pressure
  - Pressure bandage
- ◆ Elevation
  - Above heart
- ◆ Pressure Points
  - Arm, leg



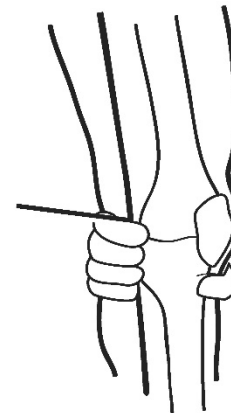
# Pressure Points



**Brachial Pressure Point**  
just above the elbow



**Femoral Pressure Point**  
in the Upper thigh



**Popliteal Pressure Point**  
behind the knee



# Tourniquet

- ◆ Use direct pressure, elevation and pressure points to control bleeding first
- ◆ If bleeding can't be stopped and getting professional treatment will be delayed a tourniquet may be a viable option to save a person from bleeding to death

**Using a tourniquet is a LAST RESORT**



# Tourniquet

- ◆ A tourniquet is a tight bandage which, when placed around a limb and tightened, cuts off the blood supply to the part of the limb beyond it.
- ◆ Use any long, flat, soft material (bandage, neck tie, belt, or stocking). **Do not use** materials like rope, wire, or string that can cut into the patient's flesh.



# Apply a Tourniquet

## To tie a tourniquet:

1. Place the tourniquet between the wound and the heart (for example, if the wound is on the wrist, you would tie the tourniquet around the forearm).
2. Tie the piece of material around the limb.
3. Place a stick, pen, ruler, or other sturdy item against the material and tie a knot around the item, so that the item is knotted against the limb.
4. Use the stick or other item as a lever to twist the knot more tightly against the limb, tightening the bandage until the bleeding stops.



# Tourniquet

5. Tie one or both ends of the lever against the limb to secure it and maintain pressure.
6. Mark the patient in an obvious way that indicates that a tourniquet was used and include the time it was applied.
7. Do not loosen a tourniquet once it has been applied.
8. Only proper medical authorities should remove a tourniquet.
9. Monitor patient for symptoms of shock.





# Tourniquet Video

U tube video:

<https://youtu.be/jTCaCJxTMgo>



# Wound Care

- ◆ Control bleeding
  - add dressings over existing dressings
  - maintain pressure - use pressure dressing
  - Elevate/pressure points
  - Tourniquet
- ◆ Prevent infection:
  - Clean wound
  - Apply dressing & bandage



# Cleaning and Bandaging Wounds

- ◆ Clean by irrigating with clean, room temperature water
  - NEVER use hydrogen peroxide
  - Irrigate but do not scrub
- ◆ Apply dressing and bandage
  - Dressing applied directly to wound
  - Bandage holds dressing in place



# Rules of Dressing

- ◆ If active bleeding:
  - Redress OVER existing dressing
- ◆ If no active bleeding:
  - Remove bandage and dressing to flush wound
  - Check for infection every 4-6 hours



# Rules of Dressing

- ◆ In the absence of active bleeding, remove dressing and flush, check wound at least every 4-6 hours.
- ◆ If there is active bleeding, redress over existing dressing and maintain pressure and elevation.
- ◆ Check for signs of infection
  - swelling
  - discoloration - redness
  - discharge (pus) from wound

# Signs of Infection

## ◆ Signs of possible infection

- Swelling around wound site
- Discoloration
- Discharge from wound
- Red striations from wound site





# Treating Amputations

- ◆ Control bleeding
- ◆ Clean wound
- ◆ Treat for shock
- ◆ Save tissue parts, wrapped in clean cloth and place in a plastic bag
- ◆ Keep tissue cool, but NOT directly on ice
- ◆ Keep severed part with the victim
- ◆ Tag Immediate during Triage!



# Treating Amputations





# Treating Impaled Objects

- ◆ Immobilize affected body part
- ◆ Don't move or remove
- ◆ Control bleeding at entrance wound
- ◆ Clean and dress wound making sure impaled object is stabilized



# Impaled Objects



USC Drill



Oklahoma Tornado - Teacher

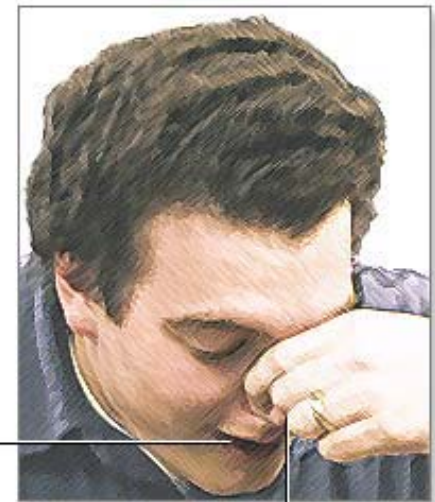
# Nasal Bleeding

- ◆ Causes:
  - Blunt force
  - Skull fracture
  - Nontrauma-related conditions – sinus infection, high blood pressure, and bleeding disorders
- ◆ Blood loss can lead to shock – may not know how much blood has been lost because victim will swallow some
- ◆ Victims may become nauseated and vomit if they swallow blood.

# Treatment of Nasal Injuries

- ◆ Control nasal bleeding:
  - Pinch nostrils or put pressure on upper lip under nose
  - Have victim sit with head forward, NOT back
- ◆ Ensure that airway remains open
- ◆ Keep victim calm

Sit and lean forward slightly



Breath through mouth

Pinch nostrils

Any questions?





## ◆ Skin

- protection from infection
- retains body water
- maintains body temperature

## ◆ Causes

- Heat
- Radiation
- Chemical
- Electrical current

# Burn Severity

- ◆ Factors that affect burn severity:
  - Temperature of burning agent
  - Period of time victim exposed
  - Area of body affected
  - Size of area burned
  - Depth of burn



# Classifications of Burns

Classification	Skin Layers Affected	Signs
1 <sup>st</sup> Degree	<ul style="list-style-type: none"><li>▪Epidermis (superficial)</li></ul>	<ul style="list-style-type: none"><li>▪Reddened, dry skin</li><li>▪Pain</li><li>▪Swelling (possible)</li></ul>
2 <sup>nd</sup> Degree	<ul style="list-style-type: none"><li>▪Epidermis</li><li>▪Partial destruction of dermis</li></ul>	<ul style="list-style-type: none"><li>▪Reddened, blistered skin</li><li>▪Wet appearance</li><li>▪Pain</li><li>▪Swelling (possible)</li></ul>
3 <sup>rd</sup> Degree (Full Thickness Burns)	<ul style="list-style-type: none"><li>▪Complete destruction of epidermis and dermis</li><li>▪Possible subcutaneous damage (destroys all layers of skin and some or all underlying structures)</li></ul>	<ul style="list-style-type: none"><li>▪Whitened, leathery, or charred (brown or black)</li><li>▪Painful or relatively painless</li></ul>



1<sup>st</sup> Degree



2<sup>nd</sup> Degree



3<sup>rd</sup> Degree





# Burn Treatment: DOs

- ◆ When treating a burn victim, DO:
  - Cool skin or clothing if they are still hot
  - Cover burn loosely with dry, sterile dressings to keep air out, reduce pain, and prevent infection
  - Elevate burned extremities



# Burn Treatment: DON'Ts

- ◆ When treating a burn victim, DO NOT:
  - Use ice
  - Apply antiseptics, ointments, or other remedies
  - Remove shreds of tissue, break blisters, or remove adhered particles of clothing

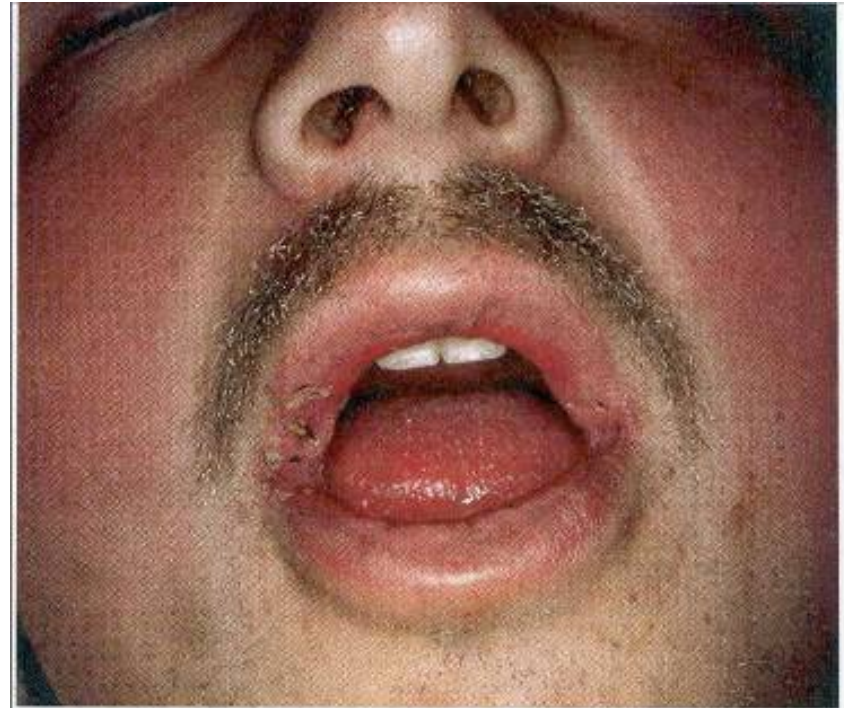
# Treatment for Chemical Burns

- ◆ Remove cause of burn + affected clothing/jewelry
- ◆ If irritant is dry, gently brush away as much as possible
  - Always brush away from eyes, victim, and you
- ◆ Flush with lots of cool running water
- ◆ Apply cool, wet compress to relieve pain
- ◆ Cover wound loosely with dry, sterile or clean dressing
- ◆ Treat for shock if appropriate



# Inhalation Burns Signs and Symptoms

- ◆ Sudden loss of consciousness
- ◆ Evidence of respiratory distress or upper airway obstruction
- ◆ Soot around mouth or nose
- ◆ Singed facial hair
- ◆ Burns around face or neck



**Figure 27-26** A singed mustache and burns to the tip of the tongue signal danger of airway burns or burns to the eyes.

Any questions?





# Indicators of Injury

- Labored or shallow breathing
- Bleeding
- Bruising
- Swelling
- Severe pain
- Disfigurement/Deformity
- How the person may have been hurt
- Signs of a head, neck, or spinal injury...

# Treating Muscle/Bone/Joint Injuries

- ◆ Objective: Immobilize the joints above and below the injury.
- ◆ If questionable, treat as a fracture.



# Fractures

- ◆ 2 types of fractures:
  - Closed
    - Broken bone with no wound
      - May or may not be deformed
      - Swelling and pain over site
  - Open
    - Broken bone with some kind of wound that allows contaminants to enter into fracture site
    - Higher priority due to
      - infection
      - bleeding



# Types of Fractures



**Closed Fracture**  
Closed Fracture in which the fracture does not puncture the skin.



**Open Fracture**  
Open Fracture in which the bone protrudes through the skin.



# Treating an Open Fracture

## DO NOT:

- ◆ Draw exposed bones back into tissue.
- ◆ Irrigate wound.

## DO:

- ◆ Cover wound.
- ◆ Splint fracture without disturbing wound.
- ◆ Place a moist 4" x 4" dressing over bone end to prevent drying.





# Dislocations

- ◆ Dislocation is injury to ligaments around joint
  - So severe that it permits separation of bone from its normal position in joint
- ◆ Treatment
  - Immobilize; do NOT relocate
  - Check PMS before and after splinting/immobilization

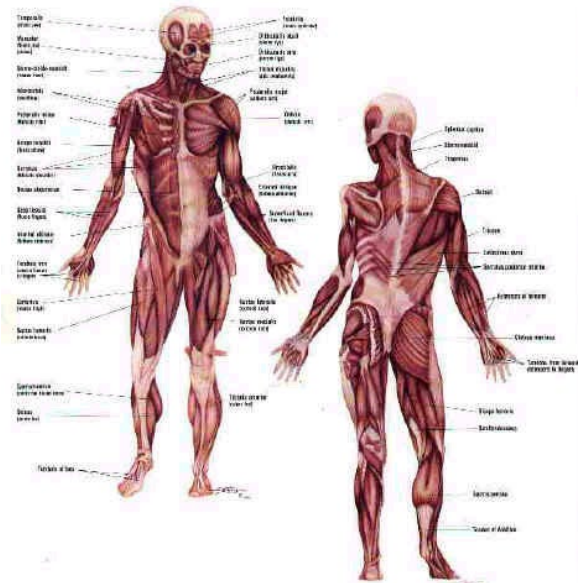
# Sprains and Strains

## ◆ Sprains:

- Tearing of a ligament or a tendon
  - Ligament connects one bone to the other
  - Tendon connects a muscle to a bone.

## ◆ Strains:

- Overstretching a muscle.





# Strains and Sprains

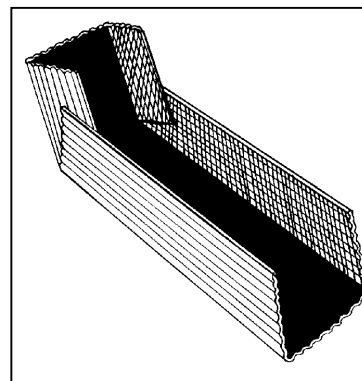
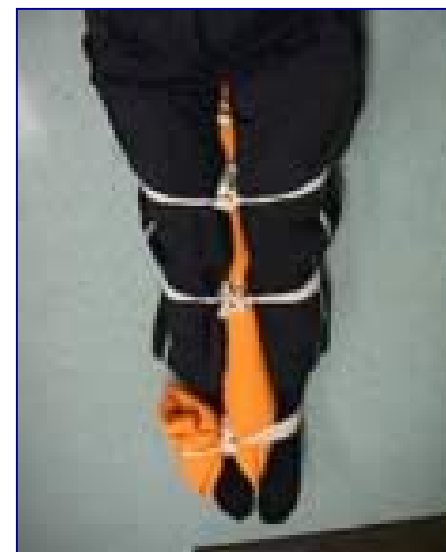
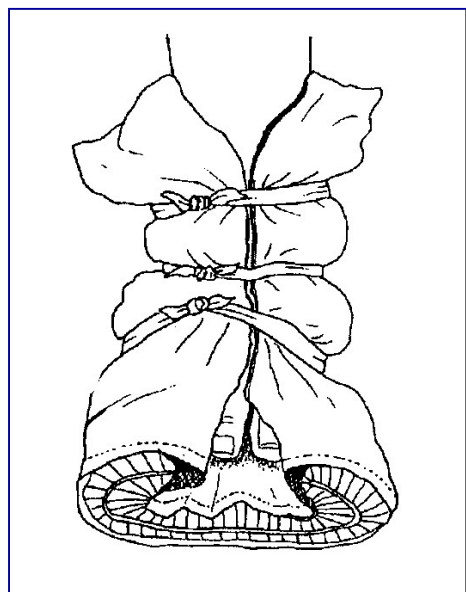
- ◆ Signs and Symptoms
  - Tenderness at injury site
  - Swelling and/or bruising
  - Restricted use or loss of use
- ◆ Treatment
  - Immobilize and elevate

# Guidelines for Splinting

- ◆ Support the injured area.
- ◆ Assess Pulse, Motor, Sensation (PMS)
- ◆ Splint injury in the position that you find it.
  - Soft splint
  - Rigid splint
  - Anatomical splint
- ◆ Immobilize above and below the injury to realign bones.
- ◆ Fill the voids to stabilize & immobilize
- ◆ After splinting reassess PMS



# Splinting



Any questions?







# Heat-Related Injuries

- ◆ Heat cramps:

- Muscle spasms brought on by over-exertion in extreme heat

- ◆ Heat exhaustion:

- Occurs when exercising or working in extreme heat results in loss of body fluids

- ◆ Heat stroke:

- Victim's temperature control system shuts down
- Body temperature rises so high that brain damage and death may result

# Symptoms of Heat Exhaustion

- ◆ Cool, moist, pale or flushed skin
- ◆ Heavy sweating
- ◆ Headache
- ◆ Nausea or vomiting
- ◆ Dizziness
- ◆ Exhaustion





# Symptoms of Heat Stroke

- ◆ Hot, red skin
- ◆ Lack of perspiration
- ◆ Changes in consciousness
- ◆ Rapid, weak pulse and rapid, shallow breathing
  
- ◆ This is very serious!



# Treatment of Heat-Related Injuries

- ◆ Remove from heat to cool environment
- ◆ Cool body slowly
- ◆ Have the victim drink water, SLOWLY
- ◆ No food or drink if victim is experiencing vomiting, cramping, or is losing consciousness



# Treatment for Bites/Stings

- ◆ If bite or sting is suspected, and situation is non-emergency:
  - Remove stinger if still present by scraping edge of credit card or other stiff, straight-edged object across stinger
  - Wash site thoroughly with soap and water
  - Place ice on site for 10 minutes on and 10 minutes off

Any questions?



# Conducting Victim Assessment

A head-to-toe assessment:

- ◆ Determines the extent of injuries and treatment.
- ◆ Determines the type of treatment needed.
- ◆ Documents injuries.







# Head-to-Toe Assessment

- ◆ Conducted on ALL victims
- ◆ Verbal, hands-on
  - Wear protective gear
- ◆ Look, listen, and feel for anything unusual.
  - Assess from top to bottom
- ◆ Assess completely before beginning treatment
- ◆ Document: injuries and treatment
- ◆ Treat all victims as if they have a spinal injury until certain they do not
- ◆ Check color, warmth, and sensation on all extremities
- ◆ Look for medical identification



# Order of Assessment

1. Head
2. Neck
3. Shoulders
4. Chest
5. Arms
6. Abdomen
7. Pelvis
8. Legs





# Indicators of Head, Neck or Spine Injury

- Unconsciousness
- Unable to move one or more body parts
- Severe pain in head, neck, or back
- Tingling or numbness in extremities
- Bleeding, bruising, or deformity of the head or spine
- Seizures
- Blood or fluid in the nose or ears
- Bruising behind the ear or “Raccoon” eyes

# DCAP-BTLS

- ◆ Deformities
- ◆ Contusions
- ◆ Abrasions
- ◆ Punctures
- ◆ Burns
- ◆ Tenderness
- ◆ Lacerations
- ◆ Swelling



▲ DEFORMITIES



▲ CONTUSIONS



▲ ABRASIONS



▲ PUNCTURES/PENETRATIONS



▲ BURNS



▲ TENDERNES



▲ LACERATIONS



▲ SWELLING

# Head, Neck, and Spinal Cord Injuries





# Closed-Head, Neck, Spinal Injuries

- ◆ Do no harm
  - Minimize movement of head and neck
- ◆ Keep spine in straight line
- ◆ Stabilize head

Any questions?





# Mass Casualty Triage

