Shock

You Are the Emergency Medical Responder

Your ambulance unit is the first to arrive on an isolated road where an 18-year-old male driver lost control of a motor vehicle and collided with a tree. In the crash, the driver's legs were broken, and he is pinned in the wreckage. You find the driver conscious, restless and in obvious pain. After a couple of minutes, the patient's condition has changed. He begins to look ill. You notice he responds only to loud verbal stimuli, is breathing fast and looks pale. His skin is cold and moist and his pulse is rapid and weak.

What would you do to help the patient?

What is shock?

Shock

A progressive condition in which the circulatory system fails to adequately circulate oxygenated blood to all parts of the body

- Another name for shock is "Hypoperfusion"
- Why is this term used?
- When the vital organs do not receive sufficient blood a response in the body occurs where smaller amounts of blood is sent to arms, legs and skin.
- This mechanism can protect the body over the short term, but if not treated, can lead to death

Shock Video

Why Shock Occurs

- Severe bleeding or loss of fluid from the body
- Failure of the heart to pump oxygenated blood
- Abnormal dilation of the vessels
- Impaired blood flow to the organs and cells

Four Major Types of Shock

- Hypovolemic – lack of blood or fluid
  - Hemorrhagic is the most common type
- Obstructive – some type of obstruction
- Distributive – inadequate distribution of blood
  - Neurogenic/vasogenic
  - Anaphylactic
  - Septic
- Cardiogenic – hearts inability to supply adequate blood supply

Other Types of Shock

- Hypoglycemic – low blood glucose levels
- Metabolic – loss of fluid
  - Diarrhea / vomiting
- Psychogenic – blood pools away from brain
  - Syncope
- Respiratory – failure of the lungs to transfer sufficient oxygen to the blood

Shock: Early Signs and Symptoms

- Shock is progressive, responding to the early signs and symptoms promptly will increase a patient's chance of survival
  - Apprehension and anxiety
  - Slightly lower body temperature
  - Rapid breathing
  - Slight increase in pulse rate
  - Normal or slightly decreased blood pressure
  - Pale, ashen and cool skin

Shock: Later Signs and Symptoms

- Listlessness and Confusion
- Difficulty speaking
- Slow, Shallow, Irregular breathing
- Decreased blood pressure (diastolic blood pressure may reach zero)
- Rapid yet weak or irregular pulse
- Pale, cold and clammy skin
- Low body temperature
- Dilated pupils that are slow to respond to light

Activity

You are providing care to a patient who has fallen off of a 6-foot ladder into a pile of construction debris. He has numerous lacerations on his body with two large open wounds on his thighs that are bleeding profusely. The patient is pale but alert and anxious. His respiratory rate is 28 breaths per minute and his pulse rate is 104 beats per minute. His blood pressure is within his usual range.

What type of Shock is the patient in?

Is he exhibiting early or late signs of shock?

Shock: Care

- Preventing is just as important as caring, follow the same steps
- Respond quickly if you identify signs/symptoms
- Ensure an open airway
- Perform a primary assessment
- Provide emergency oxygen and ventilatory support if available
- Control bleeding
- Leave patient flat in a face-up position

Shock: Care (cont'd)

- Immobilize any suspected broken bones or dislocated or damaged joints
- Maintain normal body temperature by covering patient with blankets
- Reassure the patient
- Do not give any food or drink, even if asked for
- Treatment for specific injuries or conditions
- Transport as soon as possible

You Are the Emergency Medical Responder

After extrication teams arrive, they finally free the driver from the vehicle and he is removed from the car. You notice that the patient looks worse. He now responds only to painful physical stimuli. His breathing has become very irregular. You know that the hospital is 20 minutes away.

What should you do to provide care until the patient arrives at the hospital?

Bleeding and Trauma

Extreme Trauma
Warning: Very Graphic!

You Are the Emergency Medical Responder

As a member of your company's medical emergency response team (MERT), you are called to assist a worker whose arm has been lacerated by a part that came loose from a lathe. The man's arm is bleeding severely. You arrive to find a co-worker attempting to stop the bleeding.

How would you respond?

Can bleeding be life-threatening?

Trauma System

- Level I: Capable of dealing with all levels and types of patient injury on a 24-hour basis
- Level II: Able to provide definitive care to patients, but may send patients with more severe injuries to a Level I facility
- Level III: Provides prompt assessment, resuscitation and emergency operations and arranges for transport to a Level I or II facility
- Level IV: Offers only patient care until arrangements for transportation can be made; may not have a physician on site

Bleeding
General Considerations

- The severity of bleeding is dependent on the amount of blood loss in relation to the physical size of the patient
- Severity of blood loss can be estimated by signs and symptoms or your general impression.
- Risk of infection, even with abrasions (capillary bleeding)

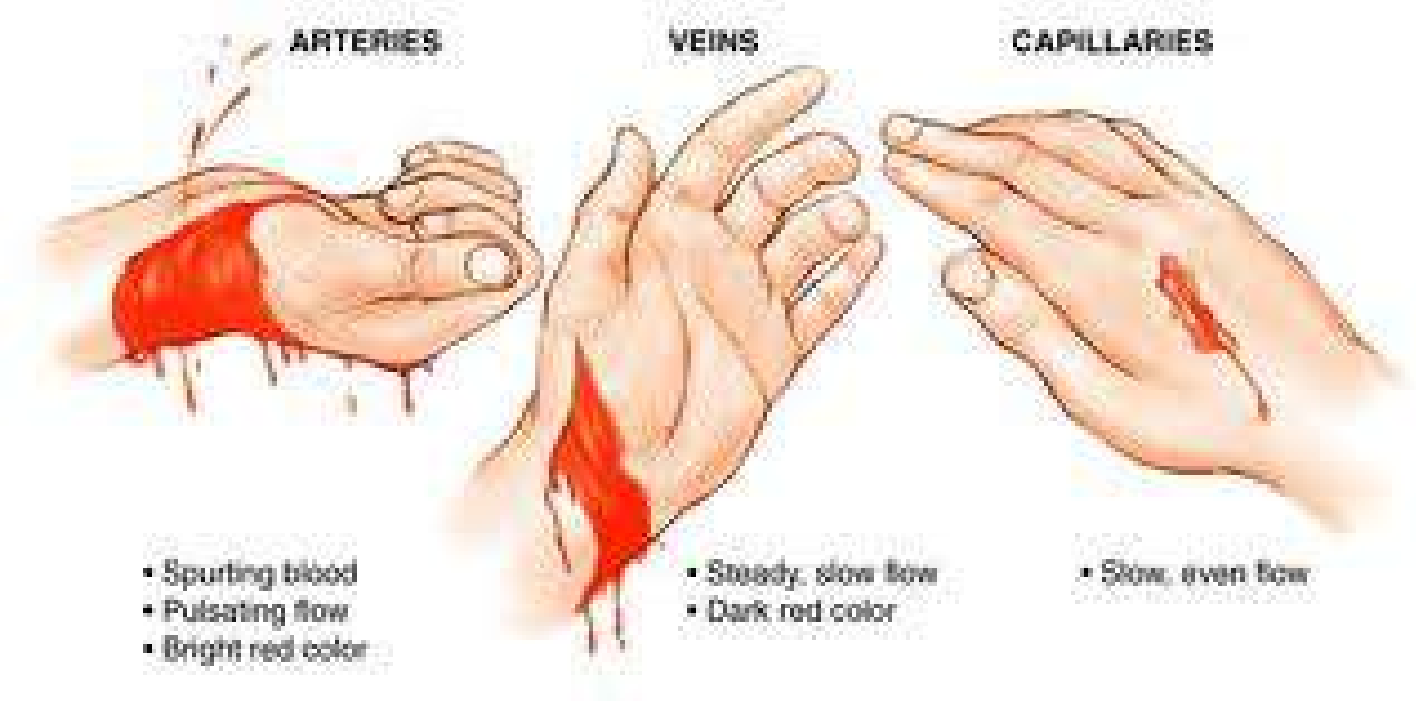
What is a Hemorrhage?

Bleeding

- Arterial
- Venous
- Capillary

Bleeding

- Arterial
- Venous



or

or

to decreased blood volume

- Spontaneous clotting

Dressings

- All open wounds need some type of covering
- Dressings placed directly on the wound to absorb blood and prevent infection
- Sterile and nonsterile gauze of varying sizes
- Universal or trauma dressings
- Occlusive dressings

Bandages

- Hold dressings in place
- Apply pressure to control bleeding
  - Commercial adhesive compresses
  - Bandage compresses
  - Roller bandages
  - Elastic bandages
  - Triangular bandages

External Bleeding: Care

- Avoid contact with the patient's blood
- Wash hands before (if practical) and after
- Use fingertip pressure first
- If wound is large or fingertip pressure is ineffective, then use hand pressure
- Additional dressings are applied over saturated dressings; saturated dressings are not removed
- If there is bleeding from an open fracture, pack sterile gauze around area; direct pressure is *not* applied over the bone

Controlling Bleeding

Other Methods to Control Bleeding

- Tourniquets
  - Only as a last resort
  - Most jurisdictions – EMT or higher level of training
- Hemostatic agents
  - Military medicine
    - Granular powder/gauze
- Elevation above heart level
- Immobilization
- Pressure points

Nose Bleeds: Care

- Usually self contained and stopped easily
- Ensure the conscious patient is sitting upright
- Tilt the head and upper body forward slightly
- Pinch the nostrils together firmly for 5 to 10 minutes
- Tell patient not to sniffle or blow nose
- Do not pack the nose to stop the bleeding
- If a skull fracture is suspected, cover nostrils loosely with sterile gauze; do *not* stop bleeding

Internal Bleeding Causes

- Variety of injuries or conditions
  - Blunt force
  - Vehicle accidents
- Internal bleeding can occur with external bleeding
- Internal bleeding may not be easy to recognize

Internal Bleeding: Signs and Symptoms

- Discoloration of the skin around the area
- Nausea, vomiting or coughing up blood
- Discolored, painful, tender, swollen or firm
- Tenderness and guarding (protecting the area)
- Anxiety or restlessness
- Rapid, weak pulse; rapid breathing
- Cool or moist, pale, ashen or bluish skin
- Excessive thirst
- Declining Level of Consciousness (LOC)
- Drop in blood pressure

Internal Bleeding: Care

- Call for more advanced medical personnel
- Keep the patient still
- Care for shock

Activity

You arrive on the scene of an emergency in which a patient has fallen off of an 8-foot porch roof into a pile of trash being cleared from the home. He initially landed on his feet and then fell backward. You notice a large open wound on his lower left leg with what looks like a piece of bone protruding. The wound is bleeding steadily from the site. He is complaining of severe pain in his back.

What type of bleeding is occurring?

What care would you provide?

You Are the Emergency Medical Responder

You have called for more advanced medical personnel. Blood is spurting with each beat of the patient's heart. The bandage is soaked with blood, and your partner notices that the patient is turning pale and his LOC is changing.

What type of bleeding is occurring?

How do you continue to respond?

What other concerns do you have and what additional steps should you take until EMS arrives?

Soft Tissue Injuries

You Are the Emergency Medical Responder

You are on the medical emergency response team (MERT) responding to a call at a power plant where at least one worker has suffered an electrical shock from a live junction box. Plant workers thought that a colleague had turned off the power, but when the injured worker reached inside and touched a wire, he received a shock and an electrical burn. The injured worker has lost consciousness. A second worker at the scene moved away from his co-worker and called for help. When you arrive, the co-worker who placed the call relates what happened.

What are your immediate concerns?

Soft Tissue Injuries

- Injury to the skin, fat and muscle that protect underlying body structures
- An injury to the soft tissues is called a wound
- Wounds are either open or closed
- Burns are a special type of soft tissue injury

Closed Wounds

- A bruise (contusion) is the simplest type
- Hematoma: caused by a violent force hitting the body, injuring large blood vessels and deeper layers of muscle tissue and causing heaving bleeding
- Signs and symptoms:
  - Discoloration
  - Swelling

Open Wounds

- Abrasions
- Amputations
- Avulsions
- Crush injuries
- Punctures/penetrations
- Lacerations

Open Wounds: General Care

- Follow standard precautions - PPE
- Bleeding control – direct pressure
- Care for shock

Minor Open Wounds: Care

- Control any bleeding
- If possible, irrigate with clean, warm running water for about 5 minutes to remove any dirt and debris
- Clean with soap (if available) and water
- If bleeding continues, use a new sterile dressing and apply more pressure
- After bleeding stops, remove the dressing and apply antibiotic ointment
- Cover the wound with a sterile dressing and a bandage

Impaled Object: Care

- Remove an impaling object only if—
  - It has pierced through the cheek, resulting in uncontrolled bleeding
  - It interferes with airway management or has pierced through the chest and is interfering with CPR
- Leave the object in place, secure it manually and control bleeding with direct pressure using sterile dressings
- Apply a bulky dressing around the object, pack dressings and secure in place

Amputation: Care

- Control external bleeding
- Have second responder search for and provide care for the body part
  - If amputation incomplete, stabilize the part but do not remove it
  - If complete, find it, wrap the part in sterile gauze moistened with sterile saline, if available
  - Place it in a labeled, sealed plastic bag (patient's name, date and time)
  - Place bag in a container of ice and water slurry

Activity

You and your partner are called to the scene of a construction site. One of the workers was using an electric saw when he suddenly lost control of it. As the saw fell to the ground, it came into contact with his lower leg, severing it completely.

How would you provide care to the patient?

Burns

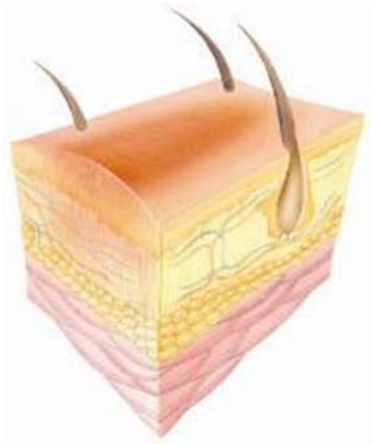
- Severity of a burn depends on the—
  - Temperature of the source of the burn
  - Length of exposure to the source
  - Location of the burn
  - Size of the burn
  - Patient's age and medical condition

Classifications of Burns

- Depth – generally three classifications
- Extent – Rule of Nine's
- Respiratory involvement
- Body part burned – hands, feet, genitals
- Cause – source
- Severity – critical burns
  - Life-threatening, disfiguring, disabling

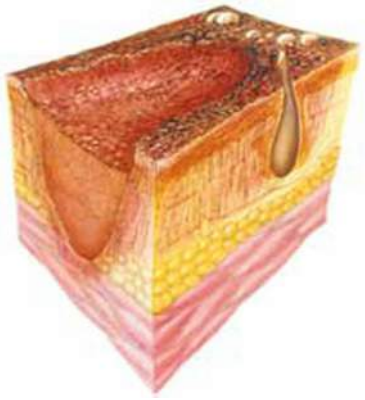
Depth of Burn

- Superficial (1st degree) (involving epidermis)



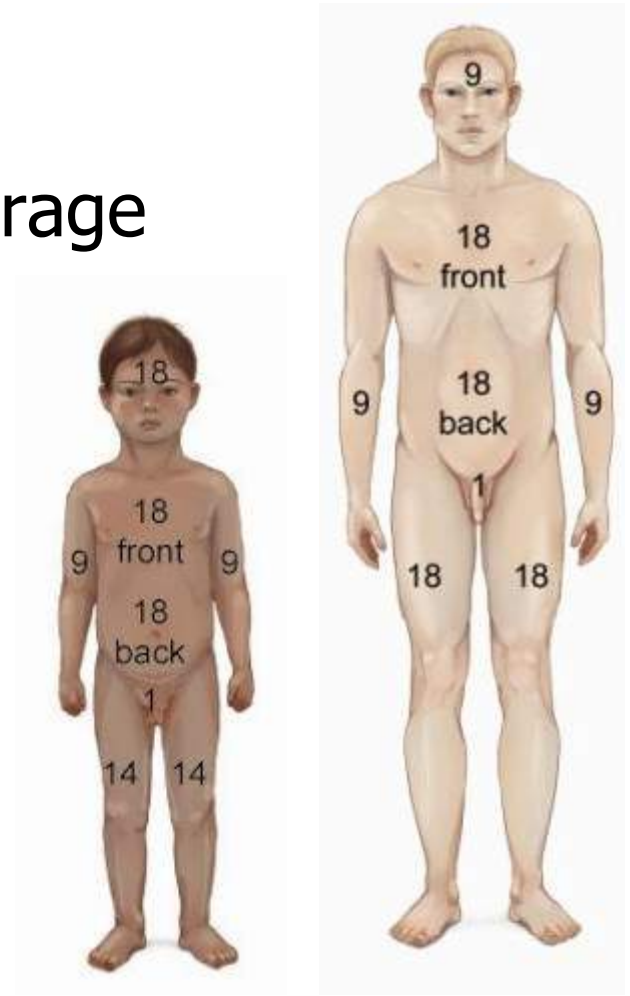
- Partial thickness (2nd degree)
- (involving epidermis and dermis)

- Full thickness
- (3rd degree)
- (destruction of epidermis and dermis and any or all underlying structures



Extent of Burn

- Rule of Nines
  - 11 sections, each comprising 9 percent of the body's skin coverage
  - 1 percent for genital area
- Lund-Browder diagram for children
- Rule of palm



Activity

You are assessing a patient who has sustained partial- and full-thickness burns over various parts of his body. Assessment reveals burns on his right arm, anterior chest and right leg.

Estimate the percentage of body surface area burned.

Estimated body surface burned is 45 percent.

(9 percent for the right arm plus 18 percent for the anterior chest plus 18 percent for the right leg)

Respiratory Involvement

- Respiratory system may be damaged when a patient is burned
- Soot or burns around the mouth, nose or rest of face
- Hoarse voice
- Inhalation of superheated air or smoke and toxic gases
- Circumferential burns

Cause of Burns

- Thermal
- Chemical
- Electrical
- Radiation

Treating Burns

Thermal Burns
Signs and Symptoms

- Superficial burns:
  - Painful, appear as a reddened area that turns white when touched, do not produce blisters and have skin that appears moist

- Superficial partial-thickness burns:
  - Painful; have a red area that turns white to touch; the skin may have mottling, blisters and may appear moist; and the hair is still present

Thermal Burns
Signs and Symptoms (cont'd)

- Deep partial-thickness burns
  - May or may not be painful (nerve endings may be destroyed); moist or dry (sweat glands may be destroyed); may or may not turn white when the area is touched; and hair usually is gone

- Full-thickness burns
  - Painless, no sensation to touch, pearly white or charred, dry and may appear leathery

Thermal Burns: Care

- Scene size-up for safety
- Removal from burn source
- Primary assessment; physical exam
- **Cooling of burn area with large amount of cold tap water; do not use ice or ice water.
- **Covering of burn area – dry sterile dressing
- **Minimizing shock
- Keep warm to prevent hypothermia

Chemical Burns
Signs and Symptoms

- Common in industrial settings / home
- Acids or alkalis
- Pain, burning, numbness
- Change in Level of Consciousness (LOC)
- Respiratory distress
- Oral discomfort or swelling
- Eye discomfort and change in vision

Chemical Burns: Care

- Summon more advanced medical personnel
- Brush dry or powered chemicals off with a gloved hand or cloth or flush them off with water
- Flush liquids with large amounts of cool, running water for at least 20 minutes
- Have patient remove contaminated clothing and jewelry
- Take steps to minimize shock
- If the eyes are involved, flush affected eye until more advanced medical personnel arrive or for at least 20 minutes

Electrical Burns: Signs and Symptoms

- Unconsciousness
- Dazed, confused behavior
- Obvious burns on the skin's surface
- Difficulty breathing or no breathing
- Burns both where the current entered and where it exited the body, often on the hand or foot

Electrical Burns: Care

- Ensure scene safety
- Perform a primary assessment once the electrical current is secured and no longer passing through the patient
- Care for any immediate life-threatening conditions
- Look for two burn sites (entry and exit wound)
- Cool any electrical burns with cold water
- Cover with a dry sterile dressing
- Provide care to minimize shock
- Prepare for .....

You Are the Emergency Medical Responder

The safety officer quickly verifies that power has been shut off and it is safe to approach the scene. You perform a primary assessment. The patient regains consciousness and complains of pain in his hand and elbow. Your partner has called for more advanced medical personnel.

What types of injuries or conditions should you suspect and what emergency care should be provided?