Soft Tissue Injuries

- Describe the difference between a closed and open wound.
- List the signals of a severe closed wound.
- List six main types of open wounds.
- Describe how to care for closed and open wounds.
- List the signals of an infected wound.
- Describe how to prevent infection in an open wound.
- Describe how burns are classified.
- Describe the signals of the different types of burns.
- Describe how to care for heat (thermal), chemical, electrical and radiation burns.

Introduction

- Millions of people suffer disabling injuries each year.
- Thousands of lives are lost each year as a result of injuries.
- The more common injuries involve the soft tissues of the body.
- Soft tissue injuries include the layers of the skin, fat and muscle.

Soft Tissue Injuries

- The skin is composed of two primary layers:
  1. Outer (epidermis)
     - The epidermis provides a barrier to bacteria and other organisms that can cause infection.
  2. Deep (dermis)
     - The dermis layer contains the
       - Nerves.
       - Hair roots
       - Sweat.
       - Oil glands.
       - Blood vessels.
Soft Tissue Injuries

- The hypodermis, located beneath the epidermis and dermis, contains—
  - Fat — insulates the body and provides energy storage
  - Blood vessels
  - Connective tissues.
- The muscles lie beneath the fat layer and comprise the largest segment of the body's soft tissues.

Wounds

- A wound is a physical injury involving a break in the layers of the skin.
- Wounds are typically classified as either closed or open.
  - Closed wound — the soft tissue damage occurs beneath the surface of the skin.
  - Open wound — has a break in the skin.
Closed Wounds

- The simplest closed wound is a bruise, also called a contusion.
- Bruises result when the body is subjected to force.

Care for Closed Wounds

- To decrease bleeding and to help control pain and swelling—
  - Apply direct pressure with ice or a cold pack
  - Elevate if it does not cause more damage.
- Call 9-1-1 or the local emergency number if
  1. the victim complains of severe pain
  2. cannot move a body part
  3. the injured extremity is blue or extremely pale
  4. Forced caused serious damage

Open Wounds

- In an open wound, the break in the skin can be as minor as a scrape of the surface layers or as severe as a deep penetration.
- Six common types of open wounds:
  - Abrasion
  - Laceration
  - Avulsion
  - Amputation
  - Puncture /Penetration
  - Crush Injuries
- Abrasion
  - Skin is scraped or rubbed away
  - Susceptible to infection
Open Wounds

- **Laceration (cut)**
  - May have smooth or jagged edges
  - Bleed freely and sometimes heavily
  - Pain may be minimal

Open Wounds

- **Avulsion**
  - Tearing away of tissue
  - Bleeding is significant if deeper tissues are involved
    - Involves larger arteries

Open Wounds

- **Amputation**
  - Occurs when a body part is severed.
  - Damage to the tissue is severe, but bleeding is usually not as bad as expected.
    - The blood vessels usually constrict and retract at the point of injury slowing the bleeding and making it relatively easy to control with direct pressure
Open Wounds

- **Puncture**
  - Skin is pierced with a pointed object
    - nail, splinter, knife, bullet, etc
  - External bleeding may be minimal, but internal bleeding can be severe
    - An embedded object may seal an opening to minimize bleeding, but introduce pathogens into deep tissue
  - May produce two open wounds if object passes through both sides

Open Wounds

- **Crush Injury**
  - The result of a body part, usually an extremity, being subjected to a high degree of pressure, such as being compressed between two heavy objects.
    - This type of injury may be open or closed.
  - May result in serious damage to underlying tissues and cause bleeding, bruising, fracture, laceration and compartment syndrome

In a severe crush injury to the torso, internal organs may rupture.

Care for Open Wounds

- All open wounds need some type of covering to help control bleeding and prevent infection. These coverings are commonly referred to as dressings and bandages.
  - A dressing is a pad placed directly over a wound to absorb blood and other body fluids and to prevent infection.
  - A bandage is any material used to wrap or cover any part of the body.
Dressings and Bandages

- An **occlusive dressing** closes a wound and prevents it from being exposed to the air.
- A bandage applied snugly to create pressure on a wound or an injury is called a **pressure bandage**.

Commonly used bandages:

- **Adhesive compress.**
  - “band-aids”
- **Bandage compress.**
  - Thick gauze attached to a bandage that is tied in place
  - Designed to control bleeding

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Roller bandage

To apply a roller bandage—
- Check feeling, warmth and color.
- Secure the end of the bandage.
- Do not cover fingers or toes.
- If blood soaks through the dressings, do not remove them.
  Apply additional dressings and another bandage and continue to apply pressure.

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Elastic roller bandage (elastic wrap)

- Elastic roller bandages are designed to keep continuous pressure on a body part.
- If properly applied, an elastic bandage can control swelling or support an injured limb as in the care for elapid (coral) snakebite.
- If improperly applied, an elastic bandage can restrict blood flow and cause tissue damage if not corrected.
- Always check the area above and below the injury site for feeling, warmth and color.
Care for Minor Open Wounds

- Follow these general guidelines:
  - Put on disposable gloves.
  - Place a sterile dressing over the wound.
  - Apply direct pressure for a few minutes.
  - Wash the wound thoroughly with soap and water.
    - For a splinter, remove first, then wash thoroughly
  - Remove the dressing, and apply triple antibiotic ointment or cream if person has no known allergies or sensitivities to medication once the bleeding is controlled.
  - Apply a new sterile dressing. Apply tape or bandage.
  - Wash your hands immediately after giving care.

Care for Major Open Wounds

- To care for a major open wound:
  - Call 9-1-1 or the local emergency number.
  - Use personal protective equipment.
  - To control external bleeding, use the general steps below:
    - Cover the wound with a dressing and press firmly against the wound with a gloved hand.
    - Apply a pressure bandage.
    - If blood soaks through the bandage, do not remove it; add more dressings and bandages to help absorb the blood.
  - Monitor ABCs.

Care for Major Open Wounds

- To care for a major open wound: (cont’d)
  - Take steps to minimize shock.
  - Keep the victim from getting chilled or overheated.
  - Have the victim rest comfortably and reassure.
  - Wash your hands immediately after giving care.
Care for Major Open Wounds

If the victim has an avulsion in which a body part has been completely severed:
- Call 9-1-1 or the local emergency number.
- Put on disposable gloves.
- Wrap the severed part in sterile gauze or any clean material. (sterile saline can be used)
- Place the wrapped part in a plastic bag. Keep the body part cool by placing the bag on ice.
- Make sure the severed part is transported with the victim to the medical facility.

If the victim has an embedded object in the wound—
- Put on disposable gloves.
- Do not remove the object.
- Use bulky dressings to stabilize the object.
- Control bleeding by bandaging the dressing in place around the object. (Figure 10-10)
- Wash your hands immediately after giving care.
- Call 9-1-1 or the local emergency number
Infection

- Even a small, seemingly minor laceration or abrasion has the potential to become infected.
- An infection can range from merely unpleasant to life threatening.
  - Tetanus is a particularly dangerous infection caused by bacteria that produce a powerful poison in the body.
  - In most cases, tetanus can now be successfully treated with antitoxins.
  - A person who has an open wound should also be advised to check with his or her health care provider about the need to update his or her tetanus immunization.
- The best initial defense against infection is to clean the area.

Signals of infection include the following:
- The area around the wound becomes swollen and red.
- The area may feel warm or throb with pain.
- Some wounds have a pus discharge.
- More serious infections may cause a person to develop a fever and feel ill.
- Red streaks may develop that progress from the wound in the direction of the heart.

If you see any signals of infection:
- Keep the area clean
- Change coverings over the wound daily.
- If a fever or red streaks develop, the infection is worsening

Burns

- Burns are a special kind of soft tissue injury.
  - Thermal (heat)
  - Chemicals
  - Electricity
  - Radiation
- Burns account for about 25 percent of all soft tissue injuries.
- Burns break the skin and can cause infection, fluid loss and loss of body temperature control.
- The severity of a burn depends on—
  - The temperature of the source.
  - The length of exposure to the source.
  - The location of the burn.
  - The extent of the burn.
  - The victim’s age and medical condition.
Burns

- Burns are classified by depth:
  - Superficial (first-degree)
  - Deep Partial thickness (second-degree).
  - Deep Full thickness (third-degree).
- Superficial (first-degree) burns involve only the top layer of skin. First-degree burns—
  - Appear red and dry.
  - Are usually painful.
  - May swell.
  - Generally heal in 5 to 6 days without permanent scarring.

Superficial Burn
Burns

- Partial-thickness burns (second-degree) involve both the epidermis and the dermis. Partial-thickness burns—
  - Appear red.
  - Have blisters that may open and weep clear fluid.
  - May look mottled (blotched).
  - Are usually painful.
  - May swell.
  - Usually heal in 3 or 4 weeks. Scarring may occur.

Partial Thickness Burn

- Full-thickness burns (third-degree)
  - Involve all the layers of skin, as well as any or all of the underlying structures—fat, muscles, bones and nerves.
  - Full-thickness burns—
    - Appear brown or charred (black), with the tissues underneath sometimes appearing white.
    - Can either be extremely painful or relatively painless if the burn destroyed nerve endings in the skin.
    - Can be life threatening.
    - Take longer to heal and usually result in scarring.
**Full Thickness Burn**

A critical burn requires the attention of a medical professional.
- Potentially life threatening, disfiguring and disabling.

**Call 9-1-1 or the local emergency number if the victim—**
- Has trouble breathing.
- Has burns covering more than one body part or a large surface area.
- Has suspected burns to the airway. Note burns around the mouth or nose.
- Has burns to the head, neck, hands, feet or genitals.
- Has a full-thickness (third-degree) burn and is younger than age 5 or older than age 60.
- Has burns resulting from chemicals, explosions or electricity.

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**Care for Burns**

**Care for Heat (thermal) Burns—**
- Check the scene for safety.
- Stop the burning.
- Check first for life-threatening conditions. Call 9-1-1 or the local emergency number if burns are suspected to be critical.
- Cool the burn with large amounts of cold running water until pain is relieved.
- If possible, remove any jewelry.
- Cover the burn.
- Take steps to minimize shock.
- Comfort and reassure.

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**Critical Burns**

- A critical burn requires the attention of a medical professional.
  - Potentially life threatening, disfiguring and disabling.
- **Call 9-1-1 or the local emergency number if the victim—**
  - Has trouble breathing.
  - Has burns covering more than one body part or a large surface area.
  - Has suspected burns to the airway. Note burns around the mouth or nose.
  - Has burns to the head, neck, hands, feet or genitals.
  - Has a full-thickness (third-degree) burn and is younger than age 5 or older than age 60.
  - Has burns resulting from chemicals, explosions or electricity.
Care for Burns

- To care for chemical burns—
  - Call 9-1-1 or the local emergency number.
  - Flush the burn with large amounts of cold, running water for at least 20 minutes or until EMS personnel arrive.
- If the chemical is dry or powdered—
  - Brush the chemical from the skin with a gloved hand.
  - Flush the residue from the skin with clean running tap water.
  - If possible, have the victim remove contaminated clothes.
- If the chemicals are in the eyes—
  - Flush affected eye with water until EMS personnel arrive.
  - Try to prevent the chemical from getting into an unharmed eye.

Care for Burns

- Electrical burns can cause both serious internal and external injuries.
- Signals of an electrical injury include—
  - Unconsciousness.
  - Dazed, confused behavior.
  - Obvious burns on the skin's surface.
  - Trouble breathing or no breathing.
  - Burns both where the current entered and where it exited the body, often on the hand or foot.

Care for Burns (continued)

- To care for a victim of an electrical burn—
  - Make sure the scene is safe. The source of the electricity must be turned off.
  - Check for other hazards.
  - Call 9-1-1 or the local emergency number immediately.
  - When the scene is safe, check for life-threatening conditions.
  - Be prepared to give CPR or defibrillation.
  - Look for two burn sites. These are entry and exit wounds indicating where electricity passed through the body.
  - Check for additional injuries, such as fractures.
  - Cover any burn injuries with a dry, sterile dressing.
  - Take steps to minimize shock.
Care for Burns

- To care for a victim of a radiation burn caused by the sun—
  - Cool the burn.
  - Prevent further damage by staying out of the sun or wearing a protective lotion or clothing.
  - Ask your doctor or pharmacist for recommendations on products for sunburn care.
  - Do not break blisters. Intact skin helps prevent infection.

Closing

- Caring for wounds involves a few simple steps:
  - Control bleeding.
  - Minimize the risk of infection.
  - Always wear disposable gloves or use a barrier, such as plastic wrap, dressings or a clean folded cloth, to avoid contact with blood.
  - Dressings and bandages, when correctly applied, help control bleeding and minimize the danger of infection.

- Questions?