Chapter 28
Soft Tissue Injuries

Overview
- Skin
  - Function
  - Layers
- Injuries
  - Closed Injuries
  - Open Injuries
- Emergency Medical Care for Patients with Soft Tissue Injuries
- Burns
  - Classification of Burns
  - Severity of Burns
  - Emergency Medical Care for Burn Victims
  - Special Considerations in Burn Care

Skin
Skin

- Protects the body from the environment, bacteria, and other organisms
- Helps regulate the temperature of the body
- Senses heat, cold, touch, pressure, and pain; transmits this information to the brain and spinal cord

Skin

- Layers
  - Epidermis • Outermost layer of skin
  - Dermis • Deeper layer of skin containing sweat and sebaceous glands, hair follicles, blood vessels, and nerve endings
  - Subcutaneous layer

Injuries to the Skin

- Soft tissue injuries often appear worse than they are
Injuries to the Skin

- Same injury after cleaning

Injuries to the Skin

- Closed injuries
  - Contusion (bruise)
    - Epidermis remains intact
    - Cells are damaged and blood vessels torn in the dermis
    - Swelling and pain are typically present
    - Blood accumulation causes discoloration

Injuries

- Closed injuries
  - Hematoma
    - Collection of blood beneath the skin
    - Larger amount of tissue damage compared with contusion
    - Larger vessels are damaged
    - May lose one or more liters of blood
Injuries

- Closed injuries
  - Crush injuries
    - Crushing force applied to the body
    - Can cause internal organ rupture
    - Internal bleeding may be severe with shock (hypoperfusion)

- Open injuries
  - Abrasion
    - Outermost layer of skin is damaged by shearing forces
    - Painful injury, even though superficial
    - No or very little oozing of blood
  
  - Laceration
    - Break in skin of varying depth
    - May be linear (regular) or stellate (irregular) and occur in isolation or together with other types of soft tissue injury
    - Caused by forceful impact with sharp object
    - Bleeding may be severe
Injuries

- Open injuries
  - Avulsion
    - Flaps of skin or tissue are torn loose or pulled completely off

Injuries

- Open injuries
  - Penetration/puncture
    - Caused by sharp, pointed object
    - May be no external bleeding
    - Internal bleeding may be severe
    - Exit wound may be present
  - Examples
    - Gunshot wound
    - Stab wound

Injuries

- Open injuries
  - Amputation
    - Involves the extremities and other body parts
    - Massive bleeding may be present or bleeding may be limited
Injuries

- Open injuries
  - Open crush injuries
    - Damage to soft tissue and internal organs
    - May cause painful, swollen, deformed extremities
    - External bleeding may be minimal or absent
    - Internal bleeding may be severe

Emergency Medical Care for Patients with Soft-Tissue Injuries

- Body substance isolation
- Proper airway/artificial ventilation/oxygenation
- Treat for shock (hypoperfusion)
- Manage bleeding
  - Expose the wound
  - Control the bleeding
  - Prevent further contamination
  - Apply dry sterile dressing to the wound and bandage securely in place
- Keep the patient calm and quiet
- Splint a painful, swollen, deformed extremity

Emergency Care for Soft-Tissue Injuries

- Dressings and bandages
  - Dressings
    - Stop bleeding
    - Protect the wound from further damage
    - Prevent further contamination and infection
Emergency Care for Soft-Tissue Injuries

- Types of dressings
  - Universal dressing
  - 4 x 4-inch gauze pads
  - Adhesive-type
  - Occlusive

Emergency Care for Soft-Tissue Injuries

- Bandages
  - Hold dressing in place

Emergency Care for Soft-Tissue Injuries

- Self-adherent bandages
- Gauze rolls
- Triangular bandages
- Adhesive tape
- Air splint
Emergency Care for Soft-Tissue Injuries

- Specific areas
  - Forehead

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Emergency Care for Soft-Tissue Injuries

- Specific areas
  - Shoulder

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Emergency Care for Soft-Tissue Injuries

- Specific areas
  - Hip

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Emergency Care for Soft-Tissue Injuries

- Specific areas
  - Hand

- Injuries requiring special considerations
  - Chest injuries
    - Occlusive dressing to open wound
    - Administer oxygen if not already done
    - Position of comfort if no spinal injury suspected

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**Emergency Care for Soft-Tissue Injuries**

- Injuries requiring special considerations
  - Abdominal injuries
    - Evisceration (organs protruding through the wound)
      - Do not touch or try to replace the exposed organ
      - Cover exposed organs and wound with a sterile dressing, moistened with sterile water or saline, and secure in place
      - Flex the patient’s hips and knees, if uninjured
  - Impaled objects
    - Do not remove the impaled object, unless it is through the cheek; removal will interfere with chest compressions or transport
    - Manually secure the object
    - Expose the wound area
    - Control bleeding
    - Use a bulky dressing to help stabilize the object
Injuries requiring special considerations
- Amputations
  - Concerns for reattachment
  - Wrap the amputated part in a sterile dressing
  - Wrap or bag the amputated part in plastic and keep cool
  - Transport the amputated part with the patient
  - Do not complete partial amputations
  - Immobilize to prevent further injury

Emergency Care for Soft-Tissue Injuries
- Large open neck injury
  - May cause air embolism
  - Cover with an occlusive dressing
  - Compress carotid artery only if necessary to control bleeding
Burns

- Classification of burns
  - According to depth

Burns

- Superficial
  - Involves only the epidermis
  - Reddened skin
  - Pain at the site

Burns

- Partial-thickness
  - Involves both the epidermis and the dermis, but does not involve underlying tissue
  - Intense pain
  - White to red skin that is moist and mottled
  - Blisters
Burns

- Full-thickness
  - Burn extends through all the dermal layers and may involve subcutaneous layers, muscle, bone, or organs
    - Skin becomes dry and leathery and may appear white, dark brown, or charred
    - Loss of sensation—little or no pain, hard to the touch, pain at periphery

Burns

- Percentage of body area burned
  - Size of the patient’s hand is equal to 1%
  - Rule of nines—Adult
    - Head and neck—9%
    - Each upper extremity—9%
    - Anterior trunk—18%
    - Posterior trunk—18%
    - Each lower extremity—18%
    - Genitalia—1%

Burns

- Rule of nines—infant
  - Head and neck—18%
  - Each upper extremity—9%
  - Anterior trunk—18%
  - Posterior trunk—18%
  - Each lower extremity—14%
Burns

- **Rule of nines**

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Burns

- **Severity**
  - Location
  - Percentage of body surface area (BSA)
  - Depth of burn
  - Preexisting medical condition
  - Age

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Burns

- **Severity**
  - Location
    - Face and upper airway
    - Hands
    - Feet
    - Genitalia
Burns

- **Severity**
  - Age of the patient
    - Younger than 5 years
    - Older than 55 years

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Burns

- **Critical burns**
  - Full-thickness burns involving the hands, feet, face, or genitalia
  - Burns associated with respiratory injury
  - Full-thickness burns covering more than 10% of the BSA

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Burns

- **Critical burns**
  - Partial-thickness burns covering more than 30% of the BSA
  - Burns complicated by painful, swollen, deformed extremity
  - Burns encircling any body part
Burns

- Moderate burns
  - Full-thickness burns of 2% to 10% of the BSA excluding hands, feet, face, genitalia, and upper airway
  - Partial-thickness burns of 15% to 30% of the BSA
  - Superficial burns of greater than 50% BSA

Burns

- Minor burns
  - Full-thickness burns of less than 2% of the BSA
  - Partial-thickness burns of less than 15% of the BSA

Emergency Medical Care for Burns

- Stop the burning process, initially with water or saline
- Remove smoldering clothing and jewelry
Emergency Medical Care for Burns

- Body substance isolation
- Continually monitor the airway for evidence of closure
- Prevent further contamination
- Cover the burned area with a dry sterile dressing
- Do not use any type of ointment, lotion, or antiseptic
- Do not break blisters
- Transport

Infant and Child Considerations

- Relative size
  - Greater surface area in relationship to the total body
  - Results in greater fluid and heat loss

- Critical burns
  - Full- or partial-thickness burn greater than 20% BSA
  - Any burn involving the hands, feet, face, airway, or genitalia

- Moderate
  - Partial-thickness burn of 10% to 20% BSA

- Minor
  - Partial-thickness burn less than 10% BSA
Infant and Child Considerations

- Higher risk for shock (hypoperfusion), airway problem, or hypothermia
- Consider possibility of child abuse

Burns

- Chemical burns
  - Take the necessary scene safety precautions to protect yourself from exposure to hazardous materials
  - Wear gloves and eye protection

Burns

- Chemical burns
  - Emergency medical care
  - Dry powders should be brushed off prior to flushing
  - Immediately begin to flush with large amounts of water
  - Continue flushing the contaminated area en route to the receiving facility
  - Do not contaminate uninjured areas when flushing
Burns

- Electrical burns
  - Scene safety
    - Do not attempt to remove patient from the electrical source unless trained to do so
    - If the patient is still in contact with the electrical source or you are unsure, do not touch the patient

- Electrical burns
  - Emergency medical care
    - Administer oxygen if indicated
    - Monitor the patient closely for respiratory and cardiac arrest (consider need for AED)
    - Often more severe than external indications
    - Treat the soft tissue injuries associated with the burn. Look for both an entrance and exit wound

- Electrical burn
Summary

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