

Primary Health Care Initiatives (PHCI) Project
Contract No. 278-C-00-99-00059-00
Abt. Associates Inc.

BURNS, THERMAL

LEARNING OBJECTIVES

- Describe the risks and extent of burns for individuals and the community
- Manage burns correctly
- Develop an effective treatment plan for burns
- Communicate to the patient and family necessary steps and messages in the understanding, monitoring and prevention of burn injuries

TEACHING STRATEGIES

- Review technique and knowledge of burn wound care, documentation, and medication use in burn injuries.
- Use lecture or informal presentation for didactic material, small group discussion for prevention, counseling, and patient education issues.

MATERIAL AND EQUIPMENT NEEDED

- Overhead projector
- White board or flip chart and markers for summarizing major points

LEARNING POINTS

- Definition and scope
- Pathophysiology
- Anatomy:
 - o The skin is divided into the following three layers:
 - Epidermis
 - Dermis
 - Hypodermis
- Age risks (elderly and children at greatest risk, because of physiology and thinner skin)
- History:
 - Mechanism of burn injury
 - Confinement in fire area
 - Duration of exposure
 - Tetanus immunization status
 - Allergies
 - Medications (including over the counter)
 - Past Medical History / Previous Illness
 - Last meal or beverage consumed
 - Events preceding injury

- **Pediatric Burns:**
 - Abuse as a cause of burns in all children is always suspected
 - Suspicion pointers include:
 - Multiple stories of how injury was sustained
 - Injury attributed to a sibling or unwitnessed,
 - Injury that is incompatible with the developmental level of the child.
 - Pattern burns that suggest contact with an object
 - Cigarette burns
 - Stocking glove or circumferential burns
 - Burns to genitalia or perineum.

- **Physical:**
 - Burns are classified by depth, type and extent of injury.
 - Burn Depth:
 - First degree
 - Second degree
 - Third degree.
 - Burn Type
 - Flame Burns – may be severe, associated with inhalation injury
 - Contact Burns – usually small and circumscribed
 - Scalds – often partial thickness, but can become full thickness if infected, or in children
 - Steam Burns – may be partial or full thickness
 - Electrical Burns – often deeper than initially apparent
 - Flash Burns – often associated with inhalation injury

 - Extent of Burns:
 - Surface area involved in a burn
 - Only second and third degree burns are measured in calculating the burn area.
 - The Rule of Nines to estimate the extent of burn injury
 - Changes to Rule of Nines in children

- **Complications:**
 - o Scarring
 - o Cosmetic deformity
 - o Burn wound sepsis
 - o ARDS
 - o Sepsis
 - o Death

- **Prognosis:**
 - Varies from excellent to poor, depending on depth of burn, location, and treatment

Management

- **Prehospital Care:**
 - Extrication from burned area

- Principals of trauma resuscitation.
 - Constricting objects should be removed
 - Assessment of inhalation injury
 - Indications for endotracheal intubation & oxygen
 - Cooling the burn, but not the patient
 - Prevention of contamination
 - IV access should be obtained
- Emergency Department Care:
 - Airway is stabilized
 - Assess the extent and depth of the burn injury
 - Intubation consideration and vigilance
 - Stable IV access should be obtained.
 - Parkland Formula: (4 cc of crystalloid) x (% burn) x (body weight in kg) in the first 24 hours
 - Input-output hourly observation
- Minor burns:
 - The burn area should be cooled with cool, sterile compresses
 - Special caution and possible referral for burns of face, hands, feet, over flexor portion of a joint, or circumferential (completely encircling an entire extremity)
 - Intact blisters should NOT be debrided
 - Application of antibiotic cream (sulfamylon, silver sulfadiazine) and fresh dressing twice daily
 - Tetanus status – give tetanus prophylaxis if more than 5 years since last immunization
 - Adequate follow-up in clinic until completely healed
- Consultations:
 - Critical burns should be referred – see referral criteria
 - Suspected inhalation injury should be admitted for observation

Medication

- Analgesics
- Opioids
- NSAIDs
- Topical antibiotics

Follow-up

- Transfer to Burn Center when appropriate (see referral criteria)
 - Measures to be assured prior to transfer:
 - Respiratory Support
 - Circulatory Status
 - Care of the Burn Wound:
 - Physician to physician contact be established
 - Documentation should accompany the patient

- Medical/Legal Pitfalls:
 - Failure to consider abuse as the cause of burns in the pediatric patient.
 - Failure to involve burn specialist
 - Not recognizing the potential for airway involvement
 - Not recognizing the signs of toxic inhalation

CRITICAL ELEMENTS FOR REFERRAL TO A BURN CENTER

- Criteria for a burn center or specialist referral:
 - Full thickness (3rd Degree) burns over 5% Body Surface Area
 - Partial thickness (2nd Degree) burns over 10% Body Surface Area
 - Any full thickness or partial thickness burn involving critical areas (face, hands, feet, over flexor area of a joint)
 - Circumferential burns of thorax or extremities.
 - Significant chemical injury, electrical burns, lightning injury, co-existing major trauma or presence of significant pre-existing medical conditions
 - Presence of inhalational (smoke) injury

PATIENT EDUCATION:

- Prevention of burn injuries in the home, especially with small children – fires, fireplaces, stoves, flammable liquids, matches
- Personal – proper storage and handling of flammable liquids, solvents, cleaners, gas cylinders
- Community – access to Civil Defense

CRITICAL ELEMENTS FOR EVALUATION OF COMPETENCE:

- Understand the risks of burn injury, depending on depth, extent, and location of burn
- Initial evaluation of depth and surface area of burn
- Initial management and stabilization of burn patient
- Correct management of minor burns in the health center
- Knowledge of indications for referral to burn specialist
- Communicate to the patient and family necessary steps and messages in the understanding, monitoring and prevention of burn injuries