THE UNIVERSITY OF KANSAS HEALTH SYSTEM

# Burn Assessment and Management

Guidelines to assist emergency personnel in the initial management of burn patients

## Initial Assessment and Management

### Conduct initial assessment

Primary Survey: Use ABCDEF to check the patient's status:

**A** Airway/C spine immobilization

**B** Breathing and ventilation

**C** Circulation

**D** Disability, neurologic deficit

**E** Expose (remove all clothing and jewelry) Environmental control (keep warm)

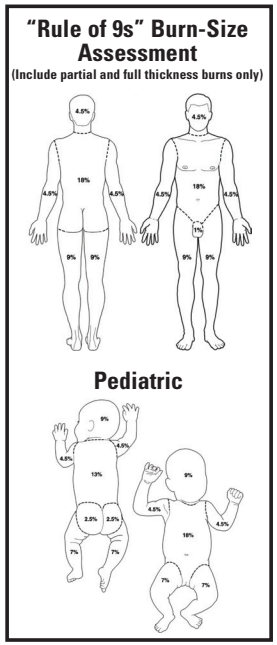
**F** Fluid

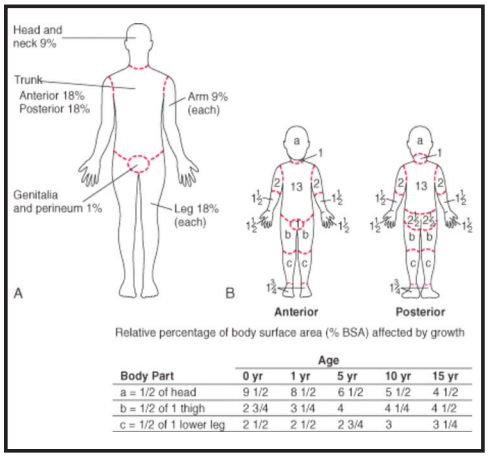
Secondary Survey: Use head-to-toe approach

- Remove all clothing and jewelry
- Quickly assess percentage of skin involved and depth of burn
- Cover patient with **clean, dry sheet**
- **Keep warm** (hypothermia occurs rapidly)
- Avoid use of ice or ointments
- If material is stuck to the skin, do not attempt to remove
- For circumferential burns, elevate burn extremity above the level of the heart
- May consider clear plastic wrap to reduce heat loss

### Calculate the percent of total burn surface area (exclude erythema)

- Use the "Rule of Nines" to estimate burn size for **adult** and **pediatric** patients
- Use Lund & Browder chart below to estimate percentages by age
- Include only partial (second degree) and full thickness (third degree) burns




Relative percentage of body surface area (% BSA) affected by growth

| Body Part | Age 0 yr | 1 yr | 5 yr | 10 yr | 15 yr |
|---|---|---|---|---|---|
| a = 1/2 of head | 9 1/2 | 8 1/2 | 6 1/2 | 5 1/2 | 4 1/2 |
| b = 1/2 of 1 thigh | 2 3/4 | 3 1/4 | 4 | 4 1/4 | 4 1/2 |
| c = 1/2 of 1 lower leg | 2 1/2 | 2 1/2 | 2 3/4 | 3 | 3 1/4 |

To estimate scattered burns: The size of the patient's hand (palm with fingers closed) represents 1% of his or her total burn surface area.

### Begin fluid resuscitation

If burn size is **greater than 10% pediatric or greater than 15% adult**, initiate fluid resuscitation.

Patients with > 30% TBSA burns require 2 large bore IVs (may be inserted through burned skin if necessary).

Pre-hospital fluid management

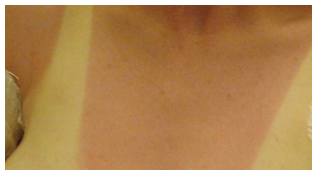
| | |
|---|---|
| < 5 yrs. | 125 ml LR/hour |
| 6-13 yrs. | 250 ml LR/hour |
| > 14 yrs. | 500 ml LR/hour |

Caution: Start IV fluid at 250 ml LR/hour for patients with pre-existing cardiac disease, pulmonary disease or age > 70.

Avoid fluid challenge unless patient is hypotensive due to trauma.

# Burn Injury Depth Classifications

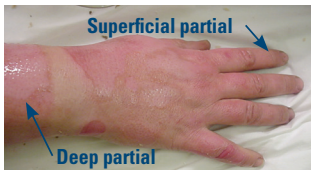
## First degree burn/superficial



These burns are not included in the percentage of total body surface.

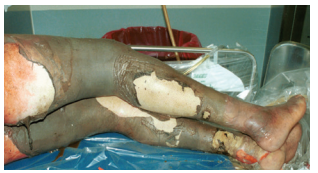
- Only epidermis is involved
- Skin is pink and dry with no blistering
- Heals in 3-5 days, usually does not scar
- Minimal risk of infection
- Capillary refill present

## Second degree burn/partial thickness




- Epidermis and dermis involved
- Skin is bright red or pearl-pink, painful and moist
- May have small to large blisters
- Rapid fluid loss may occur with large burns
- Heals in 10 days -2 weeks
- Capillary refill present

## Third degree burn/full thickness



- Epidermis and dermis destroyed
- Fascia and muscle may be involved
- Skin is tan, leathery, charred or white and may be depressed below the level of surrounding tissue
- Painful at edge of burn, otherwise insensate
- Capillary refill absent

## Burn management

### Flame/Scald/Contact Burns

- Remove all clothing and items such as jewelry
- Cover the burned area loosely with a dry dressing or clean sheets/blankets
- Do not apply ice or ointments
- May need to initiate fluid resuscitation
- Manage pain as indicated

### Additional Management of Special Types of Burn Injuries

### Chemical Burns

- Remove contaminated clothing
- Brush off powder and solid chemicals from clothing
- Irrigate involved skin with water or saline for at least 20 minutes or until the burning sensation is relieved

Caution: Do not delay transporting patient; may need to continue irrigation en route.

### Electrical Burns

The danger from an electrical shock depends on voltage, current, pathway and co-morbidities.

- Initiate fluid resuscitation regardless of burn size
- Assess for associated injuries:
  - Cardiac arrest
  - Dysrhythmias – treat per ACLS protocol
  - Respiratory failure
  - Unconsciousness
  - Muscle pain and contractions
  - Seizures
  - Numbness and tingling
- Special circumstances: High-voltage electrical injuries require trauma immobilization and evaluation

### Smoke Inhalation

- Administer 100% oxygen
- Monitor patency of airway closely

Contact the burn center for definitive management.

## When to refer a patient to the burn center

The American Burn Association identifies the following burn injuries and conditions as criteria for referral to a certified burn center.

- > 10% TBSA partial thickness burns
- Any full-thickness burns in any age
- Burns to face, feet, hands, genitalia, perineum, or over major joints
- Electrical burns, including lightning
- Chemical burns
- Inhalation injury
- Patients with pre-existing medical disorders
- Patients with concomitant trauma
- Pediatric burns in hospitals without qualified personnel or equipment to care for children
- Patients who require special social, emotional or rehabilitative intervention

Excerpted from ABLS Stabilization, Transfer & Transport. American Burn Association 2016.

## About the Gene and Barbara Burnett Burn Center

The burn center is the only adult and pediatric burn center in the greater Kansas City area that is accredited by the American Burn Association and the American College of Surgeons.

It offers state-of-the-art equipment, an on-site operating room, hydrotherapy, and complete rehab and support services for adults and children. Services include:

- Plastic surgery and reconstruction
- Occupational and physical therapy/hand rehabilitation
- School re-entry program
- Family and burn survivor support
- Outpatient Burn and Wound Care Clinic
- Burn prevention and awareness resources

The multidisciplinary burn team provides long-term continuity of care for adult and pediatric patients whose injuries require specialized treatment and rehabilitation.

We treat all types of burns and wounds, including:

- Chemical, electrical, flame and scald burns
- Large areas of skin loss from accidents or disease processes (e.g., toxic epidermal necrolysis, severe dermatitis or necrotizing fasciitis), which can result in extensive chronic wounds that are difficult to heal.

## To transfer a patient

**877-738-7286** | For information regarding small burn management or to make a referral, call the Outpatient Burn and Wound Care Clinic at **913-588-5475**.

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