

PEDIATRIC BURN PATIENTS

1 IMMEDIATE EMERGENCY BURN CARE

1. Treat according to ABLs or ACLS protocol.
2. Use airway and C-Spine precautions.
3. Stop the burning process.

2 AIRWAY MANAGEMENT

1. Administer high flow 100% oxygen to all burn patients. Be prepared to suction and support ventilation as necessary.
2. If an inhalation injury is suspected, consider intubation. Burns sustained in an enclosed space are more likely to result in an inhalation injury. Other indications of an inhalation injury include:
 - + Dark or reddened oral and/or nasal mucosa.
 - + Burns to the face, lips or nares; singed eyebrows; and/or singed nasal hairs.
 - + Carbon or soot on teeth, tongue or oral pharynx.
 - + Raspy, hoarse voice or cough.
 - + Stridor or inability to clear secretions may indicate impending airway occlusion.
 - + Mental status changes.

3 TOTAL BODY SURFACE AREA

4 FLUID RESUSCITATION

IN A PRE-HOSPITAL SETTING, SET FLUID TO:

- < 5 years 125 mL/hr
- 6-12 years 250 mL/hr
- ≥ 13 years 500 mL/hr

ONCE THE PATIENT IS IN THE EMERGENCY DEPARTMENT, USE THE FOLLOWING FORMULA* TO CALCULATE FLUIDS:

- 2-4 mL Ringer's Lactate x kg x %TBSA / 16 = mL/hr rate
- Calculate fluids from time of accident.

- A** Adult ≥13 2 mL
- C** Child <13 3 mL
- E** Electrical 4 mL

- Maintenance fluid of D5LR for age <13.....Use 4/2/1 Rule
 - 4 mL/hr for each kg up to 10 kg (40 mL max)
 - 2 mL/hr for each kg from 11-20 kg (20 mL max)
 - 1 mL/hr for each kg > 20 kg
- For TBSA >20%, consider placing Foley catheter to accurately measure urine output.

TITRATE RINGER'S LACTATE BASED ON URINE OUTPUT:

- + Adult/young adolescent >30kg..... 30-50 mL/hr (0.5 mL/kg/hr)
- + Children <30kg..... 1 mL/kg/hr
- + High-voltage electrical injury (pigmented urine)75-100 mL/hr

Consult Burn Center if urine is black/brown/red or <1 mL/kg/hr.

*Parkland formula for Burn Fluid Management

5 INJURIES

TREAT BURN PATIENT AS TRAUMA PATIENT AND CHECK FOR:

1. **Head injury** — Burns do not cause altered consciousness. If the patient has limited response to stimuli, look for another cause, such as head injury, anoxia or severe inhalation injury.
2. **Fractures.**
3. **Spinal injuries.**
4. **Soft tissue damage.**
5. **Foreign bodies** (especially in explosions).

Proceed with emergency treatment of any concomitant injuries and prevent further injuries.

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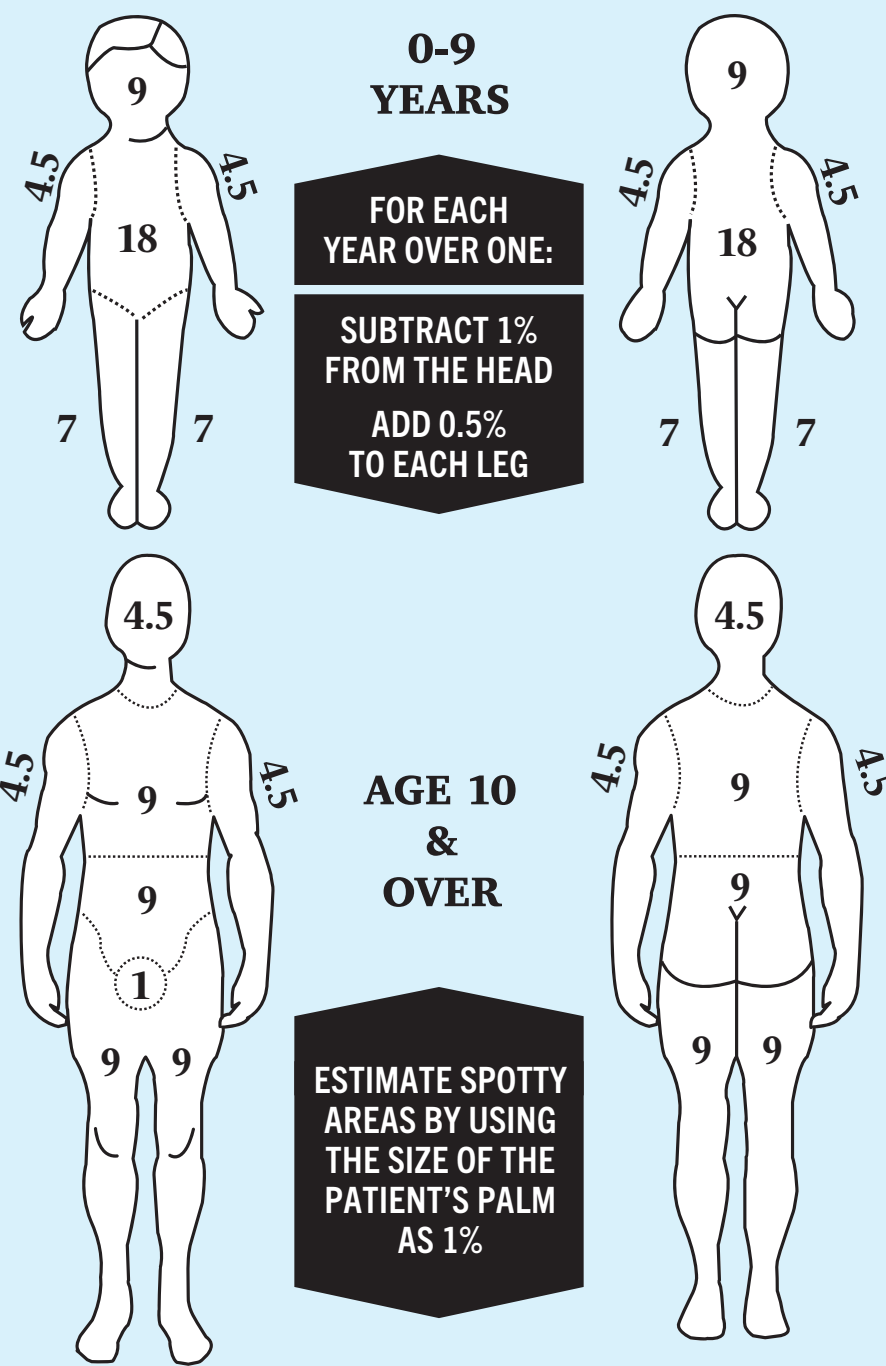


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BURN AND RECONSTRUCTIVE CENTERS OF AMERICA

TOTAL BODY SURFACE AREA BY PERCENTAGE

RULE OF NINES



PEDIATRIC CONSIDERATIONS

- Children have a smaller airway than adults.
- Be mindful of fluid adjustments for resuscitation.
- A child's skin is thinner than an adult, so burns may be deeper.
- Small children lose body temperature; be mindful to keep warm.
- Elevate HOB.

6 ESTIMATE DEPTH OF BURN INJURY

First-degree burns:

- + Are marked by red, pink or darkened skin.
- + Are painful and warm to touch.
- + No blisters or skin sloughing present.
- + Not included in TBSA calculation.

Second-degree (partial thickness) burns:

- + Are moist, reddened, blistered and painful to touch.
- + Blanch to touch.
- + Are at risk of developing into a third-degree burn. Regularly reassess second-degree burns to ensure the injury has not converted to a third-degree burn.

Third-degree (full thickness) burns:

- + Are dry/tight/leathery, brown/tan/waxy or pearly white.
- + Are devoid of blanching or capillary refill.
- + Are relatively pain-free, lacking blisters and may initially appear as second-degree.
- + Need skin grafting to heal.

Fourth-degree burns:

- + Have a charred appearance.
- + Extend below the dermis and subcutaneous fat into the muscle, bone or tendon.

7 OBTAIN PATIENT HISTORY

Obtain the following patient information:

- + How was the patient burned? Enclosed space? Any deaths at scene?
- + When did it happen?
- + Are there concomitant injuries? Rule out associated trauma.
- + Are there chemical burns — What was the agent? Concentration? Obtain Material Safety Data Sheets.
- + PMH/PSH? Allergies? Medications? Last Tetanus? Drug/alcohol history?
- + When was the patient's last meal?

8 PAIN MANAGEMENT

Give all pain medication via IV. Provide morphine sulfate (if not contraindicated) in the following proportions:

- + Titrate IV by weight (0.1 mg/kg/dose) or consult Burn Center surgeon.
- + Do not use ice, iced normal saline or iced water as a comfort measure.

9 WOUND CARE MEASURES

- + Remove all clothing, diapers, jewelry, metal and restrictive garments.
- + Consult the Burn Center concerning circumferential burns of the extremities or thorax. Escharotomies are occasionally necessary at the referring facility.
- + Assess the 5 Ps (pain, pallor, paralysis, paresthesia and pulselessness).
- + Elevate HOB and burned extremities to decrease swelling.
- + Wound debridement usually not necessary.
- + Apply sterile, dry dressings for transport.
- + Do not apply ice, ointments or creams.
- + Maintain body heat — wrap in blankets, prevent unnecessary exposure.

10 OTHER INTERVENTIONS

- + Labs: CBC, PT, PTT, fibrinogen, ABG with CK, lactic acid, carboxyhemoglobin, myoglobinuria and electrolytes.
- + X-ray: CXR and areas of suspected trauma.
- + Insert NG tube and decompress stomach if nausea and vomiting are present, patient is intubated, TBSA >20% and/or transport by air.
- + Keep patient NPO.
- + Monitor patient's vital signs and peripheral pulses every 15 minutes.

SIGNS OF CHILD ABUSE

WHAT MAKES BURNS SUSPICIOUS FOR ABUSE

- + Unexplained burn
- + Implausible history
- + Inconsistent history
- + Delay in seeking medical care
- + Frequent injuries and/or illnesses
- + Child accuses an adult
- + One parent accuses another
- + Alleged self-inflicted
- + Alleged sibling-inflicted
- + Pattern of burn
- + Immersion burns
- + Rigid contact burns
- + Caregiver absent at time of injury
- + Other signs of abuse and/or neglect
- + Prior involvement of local authorities

IF CHILD ABUSE/NEGLECT IS SUSPECTED, CONTACT THE LOCAL AUTHORITIES AS SOON AS POSSIBLE.

BURN CENTER REFERRAL CRITERIA*

*American Burn Association

Burn injuries that should be referred to a burn center include:

1. Partial-thickness burns greater than 10% total body surface area (TBSA).
2. Burns that involve the face, hands, feet, genitalia, perineum or major joints.
3. Third-degree burns in any age group.
4. Electrical burns, including lightning injuries.
5. Chemical burns.
6. Inhalation injuries.
7. Burn injuries in patients with pre-existing medical disorders that could complicate management, prolong recovery or affect mortality.

8. Any patient with burns and concomitant trauma, such as fractures, in which the burn injury poses the greatest risk of morbidity or mortality. In such cases, if the trauma poses the greater immediate risk, the patient may be initially stabilized in a trauma center before being transferred to a burn unit. Physician judgment will be necessary and should be in concert with the regional medical control plan and triage protocols.
9. Burned children in hospitals without qualified personnel or equipment for the care of children.
10. Burn injuries in patients who will require special social, emotional or rehabilitative intervention.