ORANGE COUNTY EMERGENCY MEDICAL SERVICES

BASE HOSPITAL TREATMENT GUIDELINES

BURN (THERMAL, ELECTRICAL, CHEMICAL) – PEDIATRIC

BASE GUIDELINES

1. Determine ALS Standing Order treatments/procedures rendered prior to base hospital contact. Use ALS standing order as guidelines for treatment or procedures not initiated prior to Base Hospital/CCERC contact.
2. Consider routing patient to Emergency Receiving Center with Burn Unit if any of the following major burn criteria are met:

   Mechanism of Injury
   - Suspected inhalation injury (patients burned in an enclosed space, patients with facial burns, hoarseness, dyspnea, soot in mouth, carbonaceous sputum, singed nasal hairs).
   - High voltage electric burns of > 500-1000 V (including lightning injury).
   - Chemical burns (including acids and bases).

   Physiological alteration:
   - Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
   - Circumferential burns.
   - Patients with a pre-existing medical condition that may complicate management or prolong recovery (e.g. diabetes, renal failure, cardiac or pulmonary disease).

   Total Burn Surface Area (TBSA):
   - Second degree burns > 10% total body surface area (TBSA).
   - Any area that appears to be a third-degree burn.

   note: the goal of TBSA assessment is to determine if transport to a burn center is necessary. Do not count first degree burns.

   Other
   - Pediatric (less than 10 years old or 30kg)
3. Monitor cardiac rhythm in electrical burns for rhythm disturbances.

ALS STANDING ORDER

1. For any burn injury occurring in an enclosed space or with smoke generated at the site:
   - ▶ High-flow Oxygen by mask or nasal cannula (direct or blow-by) as tolerated (pulse oximetry may be inaccurate).
2. Apply cooling measures if burn still symptomatic.
3. For wheezing or suspected smoke inhalation:
   - ▶ **Albuterol, continuous nebulization of 6 mL (5 mg)** concentration as tolerated.
4. For pain, systolic BP > 80, **base contact required (CCERC preferred) if ≤ 2 years of age** (do not inject medication or establish IV/IO thru burned skin area):
   - ▶ **Morphine sulfate: 0.1 mg/kg IV/IM**, may repeat once after 3-5 minutes for continued pain (maximum single dose 5 mg and maximum total dose 10 mg)

     OR
   - ▶ **Fentanyl 2 mcg/kg IN/IV/IM**, may repeat once after 3 minutes for continued pain (maximum single dose 50 mcg and maximum total dose 100 mcg)
5. For blood pressure ≤ 80 or signs of shock:
   - ▶ Establish IV/IO access in non-burned skin area
   - ▶ Infuse **20 mL/kg IV/IO Normal Saline bolus** (maximum 250 mL), may repeat twice to maintain perfusion. Make BH contact.
6. Contact Base Hospital/CCERC (pediatric base preferred) for Burn Unit destination if any of the following burn criteria are met:

   Mechanism of Injury
   - Suspected inhalation injury (patients burned in an enclosed space, patients with facial burns, hoarseness, dyspnea, soot in mouth, carbonaceous sputum, singed nasal hairs).
   - Electric burns (including lightning injury).
   - Chemical burns (including acids and bases).

Approved: Carl Schultz, MD

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BASE GUIDELINES

4. For continued pain and systolic BP > 80, give or repeat:
   - ▶ **Morphine 0.1 mg/kg IV/IM**
     - Maximum single dose 5 mg
     - Maximum total dose 10 mg

   OR
   - ▶ **Fentanyl 2 mcg/kg IV/IM/IN**
     - Maximum single dose 50 mcg
     - Maximum total dose 100 mcg

   Avoid administration in areas of burned skin.
5. Suspected carbon monoxide poisoning due to smoke inhalation from burning plastics or petroleum products
   - ▶ **Hydroxocobalamin 70 mg/kg IV/IO** over 15 minutes (maximum 5 g) (refer to PR-130 for mixing instruction).
6. Pediatric GCS (Procedure B-02):

Variable	Description	Score
Eye Opening	Eyes opening spontaneously	4
	Eyes opening to sound	3
	Eyes opening in response to painful stimulus	2
	No eye opening	1
Verbal Response	Smiles, oriented to sounds, follows objects, interacts, coos	5
	Irritable cries and inappropriate interactions	4
	Cries in response to pain	3
	Inconsolable and moans in response to pain	2
	No verbal response	1
Motor Response	Infant moves spontaneously or purposefully	6
	Infant withdraws form touch	5
	Infant withdraws from pan	4
	Abnormal flexion to pain for an infant (decorticate response)	3
	Extension to pain (decerebrate response)	2
	No motor response	1
Maximum Score		15

ALS STANDING ORDER

Physiological alteration:

- Burns that involve the face, hands, feet, genitalia, perineum, major joints, or are circumferential.
- Patients with a pre-existing medical condition that may complicate management or prolong recovery (e.g. diabetes, renal failure, cardiac, or pulmonary disease).

Total Burn Surface Area (TBSA):

- Second degree burns > 10% total body surface area (TBSA).
- Any area that appears to be a third degree burn.

TREATMENT GUIDELINES:

Suspected carbon monoxide poisoning (closed space burn, smoke inhalation, chemical fires):

- Pulse oximetry O_2 saturation will be inaccurate due to inability of pulse oximeter to differentiate between carbon monoxide and oxygen.

Chemical Burns:

- Brush away any remaining dry chemical.
- Irrigate burn wound and surrounding skin with copious and continuous water or saline flush to dilute and remove as much residual chemical as possible.

  Note: Some chemicals are activated by water/fluids and might worsen the burn or create hazardous fumes; e.g. sodium, phosphorus, acetyl bromide, aluminum carbide, silicon tetrachloride.

Electrical Burns:

- Electrical burns may often appear insignificant while causing marked muscle and soft tissue damage. Cardiac irritability may occur with electrical burns.
- Any burn from high voltage greater than 500 volts alternating current in a pediatric burn victim should be transported with ALS escort and cardiac rhythm monitoring as tolerated by child.

Approved: Carl Schultz, M.D.

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