**INCLUSION Criteria:** Patients of all ages who suffer from thermal, electrical, or chemical burns

**EXCLUSION Criteria:** None

**OTHER PROTOCOLS TO CONSIDER:** Airway Management, Difficulty Breathing, Hypotension or Shock, Overdose or Toxic Exposure, Syncope

**Thermal Burns**
- **Universal Care – Trauma Management**
- Remove patient from heat source
- Remove wet or restrictive non-adherent clothing and jewelry as able
  - Minimize burn area contamination by applying clean, dry burn dressing or non-adherent dressing
- Keep patient warm and prevent heat loss
- Assess depth of burn:
  - **Superficial:** *Not used when calculating total body surface area (TBSA)*
    - Involves the epidermis only
    - Pink-to-red in color, without blistering
    - Dry and moderately painful
  - **Partial thickness:**
    - Involves the superficial layer of the dermis
    - Blisters are common and may be intact or open
    - Blanch with pressure
    - Moderate to severe pain
  - **Full thickness:**
    - Involves the epidermis and dermis skin layers and can extend into the subcutaneous tissue
    - Typically appear charred, leathery, stiff, and dry in appearance
    - Affected area does not blanch under pressure
    - Little to no pain is felt in this area
- Assess extent of burn using Rule of Nines or using patient’s whole hand as 1% of body surface area (BSA)
  - Only calculate partial and full thickness burns
- For suspected airway involvement, request ALS
  - Administer **Oxygen 10-15 L/NRB for:**
    - Difficult or painful breathing
    - Stridor, wheezing, hoarse voice
    - Carbonaceous sputum
    - Singed nasal hair
  - If pulse oximetry is less than 93%, titrate **Oxygen** to lowest level to maintain pulse oximetry at 93% or greater
    - Do not withhold oxygen if patient is having difficulty breathing or if unable to assess an oxygen saturation
  - If respirations ineffective, support ventilation with **Bag Valve Mask (BVM) Ventilation**
  - If burn occurred within the last 15 minutes and BSA < 5%, cool superficial and partial thickness burns with room temperature water/saline for up to 5 minutes; do not open blisters
    - Do not delay transport to cool burns
  - If BSA < 10%, may use with sterile saline soaked dressing or dry dressing
  - If BSA > 10%, use dry sterile dressing
    - If BSA > 20%, place sterile burn sheet on stretcher before placing patient on cot for transport
    - Cover patient with dry, sterile sheets and blanket to maintain body warmth
  - If available, obtain carbon monoxide level
### Chemical Burns
- Brush off as much of the offending agent as possible
- Unless contraindicated, irrigate with copious water or saline; no water should be used with:
  - Sulfuric acid
  - Sodium metals
  - Dry chemicals
- If available, obtain a Material Safety Data Sheet (MSDS) and transport with patient

### Electrical/Lightening Burns
- Ensure scene safety; shut off or remove electrical source if safe to do so
- Consider **Spinal Motion Restriction** if patient suffered a fall or loss of consciousness
- Assess patient for both entrance and exit wounds
  - Apply dry, sterile dressing to wounds; no cooling is necessary
- Assess circulation, motor function, and sensation of all extremities
  - Suspect fractures or other extremity trauma either from significant muscle contraction and/or falls
- If patient is pulseless and not breathing, see [Cardiac Arrest](#)

**Consider transport directly to a Burn Center for any of the following:**
- Partial thickness burns > 10% TBSA
- Burns that involve the face, hands, feet, genitalia, perineum, or major joints
- Full thickness burns in any age group
- Major electrical burns, including lightening injury
- Major chemical burns
- Inhalation injury, if stable for transport
- Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality

### EMT
- Consider **Cardiac Monitoring** for electrical burns
- Consider **Waveform Capnography**
- **IF AUTHORIZED:** acquire **12 Lead ECG**
  - Electrical burns can cause cardiac arrhythmias
  - Anticipate cardiac problems
  - Transmit ECG to hospital

### AEMT
- Establish **IV/IO Access** Lactated Ringers is the fluid of choice, if available
  - A large bore IV catheter should be inserted in a reliable peripheral vein
  - In a severely burned critical patient, the IV may be placed in a vein underlying burned skin if necessary
  - Establish **Intraosseous (IO) Access** if IV access is not immediately available and cannot be established
- For burns greater than 20% BSA, administer IV/IO fluid infusion per hour:
  - **Age > 14 years:** 500 mL Lactated Ringers/hr
  - **6 – 13 years old:** 250 mL Lactated Ringers/hr
  - **Age ≤ 5 years old:** 125 mL Lactated Ringers/hr

### INT
- For suspected airway involvement or inhalation burns, airway management may be critical
  - **Endotracheal Intubation** is preferred over non-visualized airways
    - These airways may be difficult and if patient condition permits, management is best performed in the hospital setting
- Consider **Pain Management**
- If airway is compromised or at risk of imminent loss, **IF AUTHORIZED:** consider [Medication Assisted Airway Management (MAAM)]

- Airway compromise such as stridor, change in voice, and painful swallowing may occur rapidly
- Consider transporting patients < 18 years old to the local children’s hospital

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### The Rule of Nines

- **Adult**
  - Front: 4.5%, 9%
  - Back: 4.5%, 9%
- **Child**
  - Front: 18%, 7%
  - Back: 4.5%, 7%
- **Infant**
  - Front: 18%, 14%
  - Back: 9%, 14%

Note: Each arm totals 9%