

# BURNS

**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](#)

EMR

## 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
- Consider [Airway Management](#)
- Initiate [Pulse Oximetry](#)
  - 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

<b>EMR</b>	<p><b><u>Chemical Burns</u></b></p> <ul style="list-style-type: none"> <li>• Brush off as much of the offending agent as possible</li> <li>• Unless contraindicated, irrigate with copious water or saline; no water should be used with:             <ul style="list-style-type: none"> <li>○ Sulfuric acid</li> <li>○ Sodium metals</li> <li>○ Dry chemicals</li> </ul> </li> <li>• If available, obtain a Material Safety Data Sheet (MSDS) and transport with patient</li> </ul> <p><b><u>Electrical/Lightening Burns</u></b></p> <ul style="list-style-type: none"> <li>• Ensure scene safety; shut off or remove electrical source if safe to do so</li> <li>• Consider <b>Spinal Motion Restriction</b> if patient suffered a fall or loss of consciousness</li> <li>• Assess patient for both entrance and exit wounds             <ul style="list-style-type: none"> <li>○ Apply dry, sterile dressing to wounds; no cooling is necessary</li> </ul> </li> <li>• Assess circulation, motor function, and sensation of all extremities             <ul style="list-style-type: none"> <li>○ Suspect fractures or other extremity trauma either from significant muscle contraction and/or falls</li> </ul> </li> <li>• If patient is pulseless and not breathing, see <b>Cardiac Arrest</b></li> </ul> <p><b><u>Consider transport directly to a Burn Center for any of the following:</u></b></p> <ul style="list-style-type: none"> <li>• Partial thickness burns &gt; 10% TBSA</li> <li>• Burns that involve the face, hands, feet, genitalia, perineum, or major joints</li> <li>• Full thickness burns in any age group</li> <li>• Major electrical burns, including lightening injury</li> <li>• Major chemical burns</li> <li>• Inhalation injury, if stable for transport</li> <li>• Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality</li> </ul>
<b>EMT</b>	<ul style="list-style-type: none"> <li>• Consider <b>Cardiac Monitoring</b> for electrical burns</li> <li>• Consider <b>Waveform Capnography</b></li> <li>• <b>IF AUTHORIZED:</b> acquire <b>12 Lead ECG</b> <ul style="list-style-type: none"> <li>▪ Electrical burns can cause cardiac arrhythmias</li> <li>▪ Anticipate cardiac problems</li> <li>▪ Transmit ECG to hospital</li> </ul> </li> </ul>
<b>AEMT</b>	<ul style="list-style-type: none"> <li>• Establish <b>IV/IO Access</b> Lactated Ringers is the fluid of choice, if available             <ul style="list-style-type: none"> <li>▪ A large bore IV catheter should be inserted in a reliable peripheral vein</li> <li>▪ In a severely burned critical patient, the IV may be placed in a vein underlying burned skin if necessary</li> <li>▪ Establish <b>Intraosseous (IO) Access</b> if IV access is not immediately available and cannot be established</li> </ul> </li> <li>• For burns greater than 20% BSA, administer IV/IO fluid infusion per hour:             <ul style="list-style-type: none"> <li>▪ <b>Age &gt; 14 years:</b> 500 mL Lactated Ringers/hr</li> <li>▪ <b>6 – 13 years old:</b> 250 mL Lactated Ringers/hr</li> <li>▪ <b>Age ≤ 5 years old:</b> 125 mL Lactated Ringers/hr</li> </ul> </li> </ul>
<b>INT</b>	<ul style="list-style-type: none"> <li>• For suspected airway involvement or inhalation burns, airway management may be critical             <ul style="list-style-type: none"> <li>▪ <b>Endotracheal Intubation</b> is preferred over non-visualized airways                 <ul style="list-style-type: none"> <li>• These airways may be difficult and if patient condition permits, management is best performed in the hospital setting</li> </ul> </li> </ul> </li> <li>• Consider <b>Pain Management</b></li> </ul>

<b>PARA</b>	<ul style="list-style-type: none"> <li>If airway is compromised or at risk of imminent loss, <b>IF AUTHORIZED:</b> consider <a href="#">Medication Assisted Airway Management (MAAM)</a></li> </ul>
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<b>NOTES</b>	<ul style="list-style-type: none"> <li>Airway compromise such as stridor, change in voice, and painful swallowing may occur rapidly</li> <li>Consider transporting patients &lt; 18 years old to the local children’s hospital</li> </ul> <div style="text-align: center;"> <h2>The Rule of Nines</h2> <p>The diagram shows three groups of human figures representing different age groups, each with percentages for body surface areas.   <b>Adult:</b> Front view shows 4.5% (head), 18% (chest), 1% (groin), and 9% (each leg). Back view shows 4.5% (head), 18% (chest), 9% (each leg), and 4.5% (each arm).   <b>Child:</b> Front view shows 9% (head), 18% (chest), 1% (groin), and 7% (each leg). Back view shows 9% (head), 18% (chest), 7% (each leg), and 4.5% (each arm).   <b>Infant:</b> Front view shows 18% (head), 9% (each arm), 1% (groin), and 14% (each leg). Back view shows 18% (head), 9% (each arm), and 18% (back).           Note: Each arm totals 9%</p> </div>
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