



Richard M. Fairbanks Burn Center at Eskenazi Health

# BURN STABILIZATION PROTOCOL

1.800.4.TRAUMA

*Please call for patient transfers or to talk with a burn or trauma surgeon 24 hours a day.*

## American Burn Association Burn Center Referral Criteria

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

1. Partial thickness burns greater than 10% of TBSA
2. Full thickness burns in any age group
3. Burns that involve the face, hands, feet, genitalia, perineum or major joints
4. Electrical burns greater than 1,000 volts, including lightning injuries
5. Chemical burns
6. Inhalation injuries
7. Burn injuries in patients with pre-existing medical conditions 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 (Physician judgment will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.)
9. Frostbite/cold weather injuries
10. For all pediatric burn consults and transfer request (patients <18 y/o), please call the Riley Burn Center transfer line at 317.963.3330 or toll free 877.247.1177.

### **Consultations are recommended for:**

- Partial thickness burns less than 10% of TBSA
- All potentially deep burns of any size
- Electrical injuries less than 1,000 volts

# Treatment Protocol

1. Remove any sources of heat.
  - Cool any burns that are warm to the touch with tepid water and then dry patient.
  - Cover patient with a clean, dry sheet or blanket to prevent hypothermia. **DO NOT apply ice.**
2. Assess airway/breathing.
  - Carbon monoxide may present as restlessness, headache, nausea, poor coordination, memory impairment, disorientation or coma. Administer highest level of O<sup>2</sup> possible via non-rebreathing face mask.
    - **Useful lab:** Blood gases, carboxyhemoglobin level
  - Intubation is generally only necessary for unconscious patients, hypoxic patients with severe smoke inhalation, or patients with flame or flash burns involving the face and neck. Indications include pharyngeal burns, air hunger, carbonaceous sputum with hoarseness and difficulty clearing secretions.
  - If breathing seems to be compromised by tight circumferential trunk burns, consult with burn center surgeons immediately.
3. Estimate the percent of the total body surface area (TBSA) burned.
  - Use the Rule of Nines initially. See the back of this handout for a chart to aid in accurate assessment.
  - **Reminder:** Remove as much soot as possible for a more accurate assessment. **First-degree burns are not included in estimation.**
4. Obtain IV access.
  - For burns less than 20% TBSA, secure one large bore IV line in upper extremity. Add a second line if the transport will be longer than 45 minutes.
  - Burns of more than 20% TBSA require two large bore IV lines in unburned skin in upper extremities if possible.
  - **Reminder:** IVs may be placed through a burn if necessary (suture to secure). Avoid saphenous vein if at all possible. Avoid cutdowns through unburned skin if possible.
5. Initiate fluid resuscitation.
  - **Adults:** 2 ml ringers lactate x (kg of body weight) x (% TBSA burn) = ml in first 24 hours, with half of this total given in the first eight hours post-injury.
    - **Example** – Patient weighing 70 kg with a burn of 50% TBSA: 2 ml x 70 kg x 50% = 7,000 ml of ringers lactate needed in the first 24 hours, with 3,500 ml needed in the first eight hours. IVs are initially started at 438 ml/hour. Round to the nearest ml.
  - **Children younger than age 14:** 3 ml ringers lactate x (kg of body weight) x (% TBSA burn) = ml in first 24 hours, with half of this total given in the first eight hours post-injury. Children should be given daily maintenance fluids with dextrose in addition to fluid resuscitation (use 4:2:1 Rule to determine D5LR maintenance rate).
  - **Electrical:** 4 ml ringers lactate x (kg of body weight) x (% TBSA burn) = ml in first 24 hours, with half of this total given in the first eight hours post-injury.
  - **Reminders:**
    - Fluids are rarely needed to be given faster than 1.5 times the above rate.
    - Do not give dextrose solutions – they may cause an osmotic diuresis and confuse adequacy of resuscitation assessment.
6. Assess urine output.

Hourly urine output target ranges:

**Adults and children >= 14 yrs**  
0.3 – 0.5 ml/kg/hr for thermal or scald injuries  
> 1.0 ml/kg/hr for electrical injury

**Children <14 yrs**  
1.0ml/kg/hr

  - **Reminder:** Lasix and other diuretics are never given to improve urine output. Fluid rates are adjusted to achieve target urine output.
  - Observe urine for burgundy color, which is often seen with massive injuries or electrical burns. There is a high incidence of renal failure associated with these injuries, requiring prompt and aggressive intervention. Increase IV fluids to maintain urine output goal of 100ml/hr.
  - **Reminder:** If unable to stimulate high urine flow or clear pigments with increased fluid administration, consult a burn center.
7. Insert nasogastric tube.
  - Insert nasogastric tube on intubated patients, burns >20% TBSA and unresponsive patients.
  - Initiate antacid therapy if patient will not be transported within 12 hours.
  - Keep NPO for stabilization and transport.

8. Prepare for escharotomy.

- Assess for circumferential full-thickness burns of extremities or trunk. Elevate burned extremities on pillows above the level of the heart. If transfer will be delayed beyond 12 hours, check distal pulses hourly and call a burn center if pulses disappear.
- Call the burn center prior to performing escharotomy.

9. Administer medication.

- Give tetanus immunization.
- After fluid resuscitation has been started, pain medication may be given in appropriately titrated doses. Blood pressure, pulse, respiratory rate and state of consciousness should be assessed after each increment of IV morphine.
  - **Guideline:** In an adult patient, give doses of 3 - 5 mg IV morphine repeated in five- to 10-minute intervals until pain appears to be under control.
  - **Reminder:** Even small degrees of hypovolemia may grossly exaggerate effects of all medications. If blood pressure or respiratory rate falls or pulse rises by more than 20% of baseline, do not give additional morphine without consulting a burn center.
- Consult a burn center before giving any antibiotics.

10. Determine the appropriate wound care.

- If the patient transfer will be completed within 12 hours, debridement and application of topical antimicrobials is unnecessary. Be sure to transport patient wrapped in a dry sheet and blanket.
- If more than 12 hours before transfer is completed, call the Richard M. Fairbanks Burn Center at Eskenazi Health at 1.800.4.TRAUMA for wound care recommendations.
- **Reminders:**
  - Warm the treatment area as much as possible.
  - Work efficiently.
  - Monitor patient temperature.
  - Place dressings as quickly as possible.
- Remember these general items when transferring a burn patient:
  - A history, including details of the accident and pre-existing disease or allergies, should be recorded and sent with the patient.
  - Copies of all medical records, including all fluids and medications given, urine outputs, and vital signs, must accompany the patient.
  - Record the following:
    1. Mechanism of injury; 2. Past medical history; 3. Tetanus immunization status; 4. Medications; 5. Allergies; 6. Head-to-toe survey; 7. Time of last meal; 8. Additional diagnosed injuries

11. Make special considerations for chemical burns and consult with a burn center.

- Brush powdered chemicals off wound and flush chemical burns for a minimum of 20 - 30 minutes with running water.
  - **Reminder:** Never neutralize an acid with a base or vice versa.
- Irrigate burned eyes with a gentle stream of saline, flushing both the injured eye and the conjunctiva. Follow with an ophthalmology consult if transport is not imminent.
  - **Reminder:** Always irrigate eyes with the inside canthus out to avoid washing chemicals down the tear ducts.
- Determine what chemical and what concentration of the chemical caused the injury.
- If a Material Safety Data Sheet is available for the chemical identified, please send this along with the patient.

12. Make special considerations for electrical burns and consult with a burn center.

- Attach cardiac monitor. Treat life-threatening dysrhythmias as needed.
- Assess for associated trauma. Assess central and peripheral neurologic function.
- Administer ringers lactate. Titrate fluids to maintain adequate urine output or to flush pigments through the urinary tract (see instructions for urine output in number 6).
  - **Useful lab:** ABG with acid/base balance, urine myoglobin, cardiac markers
- Elevate burned extremities above the level of the heart with pillows. Monitor distal pulses (escharotomy or fasciotomy may ultimately be required).
- If transfer will be delayed beyond 12 hours, check distal pulses hourly. Consider arranging for a general surgeon to perform an escharotomy or fasciotomy if pulses disappear. Consult a burn center prior to performing a escharotomy or fasciotomy.

