Policy: All burn patients presenting to XXXXX Hospital will have appropriate assessment, stabilization and evaluation for admission or transfer to a burn care facility.

Purpose: To provide guidelines and standards of care for the patient presenting with partial and/or full thickness burns.

Scope:

Procedure:

I. **Universal precautions must be observed prior to any patient contact.**
   A. Consider decontamination of the patient based on exposure to protect the health care providers and other patients.

II. **Primary Survey** - The initial assessment of the burn patient should include a primary assessment through the methodology of ABCDEF:

   A=Airway
   B=Breathing
   C=Circulation
      Cardiac status
   D=Disability
      Neurological Deficit
   E=Expose and Examine
   F=Fluid resuscitation

III. **Airway and Breathing**
   A. Initially give humidified high flow oxygen at 15 L (100%) using a non-rebreather mask.
   B. Elevate head of bed 30 degrees if not contraindicated.
C. Examine for signs of inhalation injury with high degree of suspicion in patients with:
   1. Facial burns
   2. Singeing of the eyebrows and nasal vibrissae
   3. Carbon deposits and acute inflammatory changes in the oropharynx
   4. Carbonaceous sputum
   5. History of impaired mentation and/or confinement in a burning environment
   6. Explosion with burns to head and torso
   7. Carboxyhemoglobin level greater than 10% if patient is involved in a fire
   8. Exposure to chemical fumes

D. Perform endotracheal intubation if:
   1. Acute airway edema
   2. Stridor is present
   3. Circumferential burns of neck or chest
   4. After intubation, observe for need of chest escharotomy
   5. Observe for impending airway obstruction, if patient is hoarse or has brassy/sooty cough
   6. Physician discretion

IV. Stop the burning process
   A. Remove all clothing and jewelry; if clothing is adherent, attempt to cut away as much clothing as possible, leaving only adherent clothing in place.
   B. Chemical powders(dry):
      1. Brush powder from the wound avoiding direct contact with the chemical.
      2. Rinse with copious amounts of water. Ensure that water is flowing away from the patient, i.e., that the body parts involved are not submerged in water, such as a basin.
   C. Chemical burns (liquid):
      1. Flush with copious amounts of water for 20-30 minutes (see above).
      2. For eye burns: remove contacts, perform eye irrigations, and check for corneal damage when clinically possible.
      3. Check electrolytes.

V. Circulation
   A. Begin CPR if pulseless.
   B. Patients with > 30% TBSA require 2 large bore IVs (may be inserted through burned skin if necessary). Establish intravenous access with large caliber (at least #16 gauge catheter) in peripheral vein, preferably in upper extremities.
   C. If burn size is greater than 10% in pediatric patients or greater than 15% in adults, begin infusion with Ringer’s lactate solution.
a. Adult: 2 ml Ringer's Lactate X Body weight in kg X % TBSA second and third degree burns. Research indicates that resuscitation based upon using 4 ml LR per % TBSA burn commonly results in excessive edema formation and over-resuscitation.

2. Pediatric: (14 years and under and less than 40 kgs) 3 ml Ringer's Lactate x child's weight in kg x % TBSA second and third degree burns.

3. Adult patient with high voltage electrical injuries: if there is evidence of deep tissue injury or hemochromogens (red pigments) in the urine, begin fluid resuscitation using 4 ml Ringer's Lactate x patient's weight in kg x TBSA second and third degree burns.

4. Pediatric patients with high voltage injuries, consult a Burn Center immediately for guidance.

D. For all of the above: In the first eight hours post injury, give half the calculated amount. Then give 25 percent in the second eight hours and 25 percent in the third eight hours.

1. Any resuscitation formula provides only an estimate of fluid need. Fluid requirement calculations for infusion rates are based on the time from injury, not from the time fluid is initiated. The amount given should be adjusted according to individual patient’s response, i.e. urinary output, vital signs and general condition.

2. Infuse fluids with a fluid warmer.

3. If BSA difficult to determine or has not yet established,: use the following guidelines until transfer to a burn center:
   a. Over 14 years of age: 500ml per hour
   b. 6-13 years of age: 250ml per hour
   c. under 5 years of age: 125 ml/ per hours
   d. Caution: start IV fluid at 250 ml/hr for patients with pre-existing cardiac disease, pulmonary disease or age > 70. Avoid fluid challenge unless hypotensive due to trauma or burn.

E. Circumferential full thickness burns of a limb may impair circulation as a result of edema formation.

1. Observe for signs of impaired circulation; consider the use of Doppler to evaluate blood flow if unable to palpate pulses.

2. Perform escharotomies as necessary after consultation with a burn surgeon.

3. In the event of an electrical burn, observe for need of fasciotomy

VI. Secondary Assessment
A. History and Physical Examination

1. Cause of the burn?
2. Did the injury occur in a closed space?
3. Is there a possibility of smoke inhalation?
4. Were there chemicals or electrical contact/electrical flash involved?
5. Was there related trauma?
6. Is there suspicion of abuse or neglect?
7. If electrical, high voltage/low voltage, AC/DC?
8. NOTE: Pt. should be examined thoroughly for any associated injuries.

B. Estimate the extent and depth of burns using the Rule of Nines (adult or pediatric version appropriate). The Lund and Browder chart is preferred. *Never include 1st degree burns in estimate.

VII. Insert nasogastric tube
A. Patients with burns of more than 20 percent TBSA are prone to gastric dilatation due to ileus.
B. Intubated patients
C. Patients with associated trauma.

VIII. Insert urinary catheter
A. Patients with burns of more than 20 percent TBSA or with burns to the genitalia.
B. Accurate measurement of hourly urinary output is important in monitoring adequacy of resuscitation. For adults, maintain urine output of at least 30-50 cc/hour. For children weighing less than 40 kg: 1 ml/kg/hr.
C. In the adult with electrical injury or massive burn with hemoglobin/myoglobinuria, urinary output should be maintained at 75-100 cc per hour or 1 ml/kg/hour in a child.
D. Adjustments must be made for pre-existing cardiac disease, renal disease or in the elderly.

IX. Relieve Pain
A. Adult
   1. Fentanyl IV: give 50 mcg slowly over 1-2 minutes. Titrate to effect.
   Or
   2. Morphine sulfate IV: give in 2 mg increments every 3 minutes. Titrate to effect.
B. Pediatric
   1. Fentanyl IV: Give 1 mcg/kg every 3-5 minutes. Titrate to effect. Or
   2. Morphine sulfate IV: give 0.1 mg/kg dose every 5 minutes. Titrate to effect.
C. Avoid intramuscular or subcutaneous routes due to unpredictable absorption.

X. Give Tetanus prophylaxis

XI. Wound Care
A. Gently cover burn area with clean dry sheet or clear plastic wrap.
B. Partial thickness burns are painful when air currents pass over burned surface area.
C. Do not apply cold water to a patient with extensive burns.
D. Prophylactic antibiotics are not indicated in the early post-burn period.
E. Do not break blisters or apply an antiseptic agent.
F. Prevent hypothermia by:
   1. Maintaining warm ambient temperature
   2. Using fluid warmer
   3. Remove all wet clothing, dressings, and linens and replace with warm sheets and blankets

XII. Baseline determinations
A. Blood
   1. Complete Blood Count (CBC)
   2. Type & Screen
   3. Carboxyhemoglobin
   4. Serum glucose, electrolytes
   5. Pregnancy test in all females of childbearing age
   6. Arterial Blood Gas (ABG)
B. X-rays
   1. Chest film
   2. Others as indicated for appraisal of associated injuries

XIII. Admission guidelines if burn center admission is not possible
A. Admit to isolation room either in ICU or surgical floor.
B. Start reverse isolation with mandatory caps, masks, gowns in ICU room.
C. Consults:
   1. Metabolic Support if greater than 20% BSA.
   2. Plastic Surgery for burns of hands and face.
   3. Pulmonary Medicine for associated inhalation injuries.
   4. Ophthalmology for all electrical injuries.
   5. Physical therapy
D. Re-evaluate for possible transfer to burn center.

XIV. Consider Transfer to a Burn Center for the following:
A. BURN CENTER REFERRAL CRITERIA (American Burn Association):
   1. Burn injuries that should be referred to a burn unit include the following:
      a. Partial thickness burns greater than 10% total body surface area.
      b. Burns that involve the face, hands, feet, genitalia, perineum, or major joints
      c. Third-degree burns in any age group
      d. Electrical burns, including lightning injury
      e. Chemical burns
      f. Inhalation Injury
      g. Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality
      h. Any patients with burns and concomitant trauma (such as fractures)
i. Burned children in hospitals without qualified personnel or equipment for the care of children
j. Burn injury in patients who will require special social, emotional, or long-term rehabilitative intervention

B. **Airway, Breathing and Circulation (ABCs)** are clearly a priority of all burn patients and should be well established prior to transfer.

C. Transfer records need to include information about history, treatments (especially type and amount of fluids given) and medications given prior to transfer.

D. Physician to physician contact is essential.

E. Burn referral center contact information:
   1. These numbers are directly to the Burn Center or Transfer Center. The phone is answered 24 hours per day.

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<th>Primary referral center:</th>
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<tbody>
<tr>
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<td>Transfer Center</td>
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<td></td>
<td>Kansas City, KS</td>
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<td>(913) 588-9999</td>
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References:
Advanced Burn Life Support (ABLS) course provider manual, American Burn Association

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