Burn Consensus Statement – FAQ

BACKGROUND – MAJOR BURN

Burn injury distinguishes itself from all other trauma by its unprecedented inflammatory response during the initial 24-48 hours. Myocardial depression and increased capillary permeability result in rapid and extensive fluid shifts and the depletion of intravascular volume. Early and appropriate fluid resuscitation is essential to acute burn management and is aimed at avoiding burn shock.

QUESTION 1: HOW DO I ASSESS THE BURN PATIENT?

ATLS principles will guide the initial assessment and resuscitation of the burn injured patient using the mnemonic ABCDE in a systematic approach.

A=AIRWAY assessment and management is a critical first step in burn care. Advance airway management may be required for those who present in acute respiratory distress.
Indications for intubation may include any of the following:
**singed nasal hair, eyebrows are NOT considered a reason to intubate.*

- **Respiratory distress**
- **Stridor**
- **Accessory muscle use**
- **Extensive and deep facial burns**
- **Upper airway trauma**
- **Altered mentation**
- **Hypoxia/hypercarbia**
- **Hemodynamic instability**
- **Inability to clear secretions or respiratory fatigue**
- **Suspected inhalation injury, history of being burned in an enclosed space**
- **Swelling on laryngoscopy**

B=BREATHING & VENTILATION

- Requires the continued assessment and monitoring of breathing.
- Administer oxygen at 15 L/min via non-rebreather mask.
- Exercise caution when interpreting oxygenation in the patient with potential carbon monoxide poisoning.

C=CIRCULATION WITH HEMORRHAGE CONTROL

Current American Burn Life Support (ABLS) guidelines provide revised resuscitation formulas.

INITIAL FLUID RATE AS A STARTING POINT → Adults with ≥20% & children with ≥15% Total Body Surface Area (TBSA) 2nd & 3rd degree burn require burn fluid resuscitation.

- During the Primary Survey, **INITIAL FLUID** management for all major burns is **BASED ON AGE** and initiated **PRIOR TO** calculating the exact TBSA.

Following are the pre-hospital and early emergency care initial fluid rates for major burns:

AGE	FLUID RATE
≤ 5 years of age	**125 mL Lactated Ringers (LR) per hour**
6-13 years old	**250 mL LR per hour**
14 years and older	**500 mL LR per hour**

Key Points:

- TBSA burn percentage is determined by adding up only those body areas with 2nd and 3rd degree burn.
- Lactated Ringer's (warmed) is the preferred crystalloid used in the initial fluid resuscitation.
- A urinary catheter is required to monitor the effectiveness of fluid resuscitation. A urometer is preferred vs straight drainage bag for monitoring hourly urine output.
- Continuous assessment of hourly urine output and other physiologic parameters are essential.
- Over and under fluid resuscitation must be avoided as they have been determined to impact morbidity and mortality.

ADJUSTED FLUID RATE

- During the Secondary Survey, the TBSA is calculated and body weight in kilograms is confirmed. We then initiate the ADJUSTED FLUID RATE.

  We do NOT subtract the INITIAL FLUID RATE from the ADJUSTED FLUID.

- Electrical injury may be minimal on the surface but significant internally. The continuous monitoring of urine output to maintain 75-100 ml per hour is critical.

Adult thermal & chemical burns	*2 mL LR x patient's body weight in kg x % second and third-degree burns, with half of the 24-hour total (mL) infused over the first 8 hours post burn.*
Pediatric (13 years & under)	*3 mL LR x patient's body weight in kg x % second and third-degree burns, with half of the 24-hour total (mL) infused over the first 8-hour post burn.*
Adults & Pediatrics with electrical injury (High voltage injury)	*4 mL LR x patient's body weight in kg x % second and third-degree burns, with half of the 24-hour total (mL) infused over the first 8-hour post burn.*

QUESTION 2: WHAT ABOUT IV FLUIDS IN CHILDREN?

- **Children ≤30 kg require maintenance fluids in addition to resuscitation fluid**.
- Blood glucose should be closely monitored due to limited glycogen stores in young children.
- The fluid of choice is D5W Lactated Ringers or D5W-Normal Saline if necessary and is calculated and infused using the "4-2-1" formula.

QUESTION 3: HOW DO I KNOW I AM GIVING TOO LITTLE OR TOO MUCH FLUID?

- Perform hourly monitoring of urinary output parameters. Urine volumes less than or greater than these parameters require adjustments in fluid resuscitation rates.

Age/weight	Hourly urine output
Adult	30-50 mL/hour
Children > 30kg	0.5mL/kg/hour up to maximum of 50mL/hr
Child ≤ 30kg	1 mL/kg/hour
Adults & Children > 30kg – electrical injury with myoglobinuria	75-100mL/hour until urine clears
Children ≤ 30 kg – electrical injury with myoglobinuria	1-1.5 mL/kg/hour until urine clears

QUESTION 4: WHAT DO I PUT ON THE BURN?

- Cover with dry sterile sheets (e.g. Medline sterile ¾ drape) otherwise, use clean dry sheets. The patient must be kept warm and dry to prevent hypothermia.
- Consultation through the Toll-Free Trauma Referral System is recommended for all >10% 2nd degree burn and any third degree burn. See consultation criteria in the Burn Consensus Statement for full criteria.
- Patients being transferred for definitive care **should not** have any ointments or creams applied.
- Opiate pain control is delivered via the **intravenous route** in major burns. Small increments of **intravenous** analgesics should be initiated as early as possible. If transferring a patient, ensure adequate analgesia is available to maintain optimal pain control.
- Do not cool burns > 10% TBSA as this may induce hypothermia. Cooling a burn using tap water up to 30 minutes for burns ≤ 5 % TBSA is acceptable.
- Burn care and appropriate dressing for burn patients not meeting criteria for transfer and able to be discharged and consulted by plastics later should be guided by local plastics or consulting plastic surgeon via the Toll-Free Trauma Referral System.

QUESTION 5: AT WHAT BURN % SHOULD I BE EXPECTED TO WEAR PPE WHEN PROVIDING CARE FOR THE BURN PATIENT?

- Sterile technique and standard precautions apply when caring for the burn patient. It is essential to adhere to infection control prevention with any invasive procedure. PPE should be worn with any burn ≥20% in adults and ≥15% in children as this is a major burn and causes immunosuppression.

QUESTION 6: WHAT DO WE DO IF WE HAVE A COLD INJURY TO FEET/LEGS AND DON'T HAVE A SHOWER IN THE ED?

- If you have such a severe cold thermal injury going any distance up the legs the patient would be hypothermic and needs to be transferred for definitive care.
- Showers aren't necessary. A circulating foot bath that can be used for hands or feet would be effective.