

UAMS MEDICAL CENTER
ACS SERVICES MANUAL

SUBJECT: Initial Management and Resuscitation of Burn Injuries

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REVIEWED/UPDATED: new

EFFECTIVE: 9/1/2023

RECOMMENDATION(S): Richard Yeager, MD

APPROVAL: 9/1/2023

CONCURRENCE(S): UAMS Trauma Faculty

PURPOSE:

Guidelines for initial management and resuscitation of patients presenting with burn injuries.

DEFINITIONS:

Burn Severity Determination

- **Superficial (first degree):** Involves epidermis only and appears dry, red, easily blanchable, sometimes painful, no evidence of blistering or sloughing
- **Superficial partial thickness (second degree):** Involves epidermis and superficial dermis and appears moist, red, is very painful, and remains blanchable with blistering or sloughing of affected epidermis
- **Deep partial thickness (second degree):** Involves epidermis and deeper dermis and appears dry, pale, but remains sluggishly blanchable with overlying blistering and sloughing, and is less painful
- **Full thickness (third degree):** Injury extends through epidermis and dermis and potentially involves underlying structures and appears pale, leathery and varies in colors but is insensate to pinprick

Total Body Surface Area (TBSA): Estimation of percentage of body surface area affected by burn injury using Lund and Browder chart (recommended), Rule of Nines, or palmar method and includes only second and third degree burns

Modified Brooke Formula: $2 \text{ mL} \times \text{TBSA} \times \text{weight (kg)}$ = total fluid resuscitation expected, with the first half being given in the first 8 hours and the second half being given over the subsequent 16 hours

Ivy Index: Fluid resuscitation in excess of 250 mL/kg in the first 24 hours, an independent predictor of mortality in burn injuries

PROCEDURE:

1. Initiate standard trauma workup per ATLS including lab studies and imaging as appropriate per mechanism of injury as well as appropriate consulting services for any additional imaging.
2. Calculate TBSA of burn injury and begin fluid resuscitation using LR or Plasmalyte according to Modified Brooke Formula ($2 \text{ mL} \times \text{TBSA} \times \text{weight (kg)}$), giving one half of the total volume calculated over the first eight hours and the remaining half given over the subsequent 16 hours.
 - a. Include only second and third degree burns in calculation of TBSA
 - b. For burn injuries > 10% TBSA, recommend placement of Foley catheter to monitor urine output on an hourly basis
 - c. Goal for fluid resuscitation is to maintain urine output of 0.5 mL/kg/hr
 - i. If this goal urine output is met, can titrate fluid rate down by 30% per hour.
 - ii. If urine output is less than 0.5 mL/kg/hr, increase fluid rate by 30%.
 - iii. Exceptions include burns secondary to high voltage electrical injury and pediatric patients where goal urine output is 1 mL/kg/hr
 - d. Avoid crystalloid boluses as this can contribute to exceeding the Ivy Index
 - e. If INR > 1.3, give 2 units of FFP, including that volume in modified Brooke calculation
3. Initiate consultation with on-call Burn Surgeon at Arkansas Children's Hospital Burn Unit to obtain further recommendations and discuss if transfer to Burn Unit is appropriate

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- a. If transfer request is accepted, continue to monitor hemodynamic status and hourly urine output, titrating fluid rate as appropriate, until patient has left UAMS
4. Ensure tetanus vaccination is current; if not, provide dose
5. Prophylactic antibiotics are not recommended for burn injuries
6. If initial debridement to be performed at UAMS, recommend gentle cleansing of all burned skin with warm, soapy water, taking care to remove all devitalized tissue, including disruption of any blisters that may have formed and cover wounds with double antibiotic ointment, Vaseline gauze, and Kerlix or other dry gauze as appropriate. Facial burns can be covered in Bacitracin only. Dressings should be changed daily for the first 72 hours.
7. If other traumatic injuries or bed availability precludes transfer to ACH Burn Center, photographs of burn injuries can be uploaded to Epic on a daily basis and additional recommendations for wound care and management can be made by Burn Surgery as needed until transfer is feasible.

PERFORMANCE MONITORING:

1. Maintaining urine output of 0.5 mL/kg/hr
2. Time from Burn Surgery consult initiation to transfer to burn center

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ADDITIONAL RESOURCES:

Lund and Browder Chart:

**Burn Estimate and Diagram
Age and Area**

Initial evaluation*

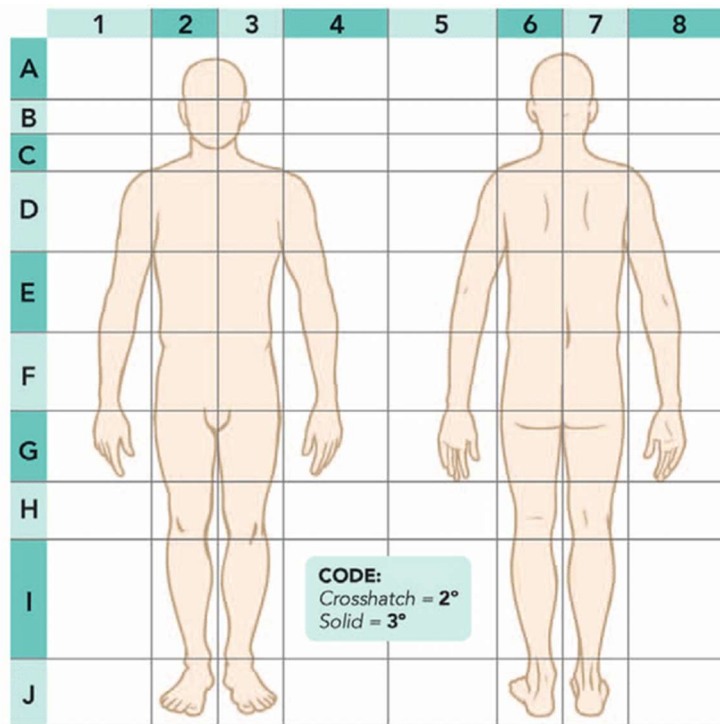
Signature: _____

Date of burn: _____

Date completed: _____

*To be completed by the admitting physician or Licensed Independent Practitioner on admission

This is a working burn estimate diagram only, and is not as accurate as photography.



Area	Birth-1 yr.	1-4 yrs.	5-9 yrs.	10-14 yrs.	15 yrs.	Adult	2°	3°	TOTAL
Head	9	17	13	11	9	7			
Neck	2	2	2	2	2	2			
Anterior trunk	13	13	13	13	13	13			
Posterior trunk	13	13	13	13	13	13			
Right buttock	2.5	2.5	2.5	2.5	2.5	2.5			
Left buttock	2.5	2.5	2.5	2.5	2.5	2.5			
Genitalia	1	1	1	1	1	1			
Right upper arm	4	4	4	4	4	4			
Left upper arm	4	4	4	4	4	4			
Right lower arm	3	3	3	3	3	3			
Left lower arm	3	3	3	3	3	3			
Right hand	2.5	2.5	2.5	2.5	2.5	2.5			
Left hand	2.5	2.5	2.5	2.5	2.5	2.5			
Right thigh	5.5	6.5	8	8.5	9	9.5			
Left thigh	5.5	6.5	8	8.5	9	9.5			
Right lower leg	5	5	5.5	6	6.5	7			
Left lower leg	5	5	5.5	6	6.5	7			
Right foot	3.5	3.5	3.5	3.5	3.5	3.5			
Left foot	3.5	3.5	3.5	3.5	3.5	3.5			
**Only 2° and 3° burns are included in the total TBSA burn percent						TOTAL			

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