

**Maine EMS Trauma Advisory Committee
Consensus Statement and Clinical Advice for Trauma Management**

TRANSFER OF PATIENTS WITH BURNS

PART I: Key Concepts

- A. As with most injured patients, initial management of burn injuries should focus on the ABC's.
- B. With rare exceptions, initial burn wound care amounts to a) arresting the burning process, and b) applying clean, dry dressings.
- C. An estimate of affected total body surface area (TBSA) is important to triage and treatment. Burns over 20% TBSA in adults or 10% TBSA in children should be treated at a hospital that specializes in burn care. Many smaller burns, especially those involving face, hands, feet, or perineum should also be managed at a hospital that specializes in burn care.
- D. Patients with large burns or burns involving functional areas mentioned above are critically ill and should be discussed with a trauma surgeon at the regional trauma center to discuss care needs and facilitate transfer regardless of ultimate destination.
- E. Resources for transfer which will be discussed by regional trauma center staff and the referring hospital staff will include the regional trauma centers, the Burn Service at Maine Medical Center, and burn centers in Boston.

PLEASE REMEMBER:

Transfers or consultations related to burn injuries – *regardless of age, comorbidities, or eventual destination* – should be directed to the attending trauma surgeon at your regional trauma center. The trauma surgeon will recommend and facilitate subsequent actions or consultations as needed.

PART II: Annotations and Rationale

- A. *As with most injured patients, initial management of burn injuries should focus on the ABC's.*

Early deaths among burned patients are almost always caused by airway/ventilation catastrophes or circulatory shock. With this in mind, the burn wounds can be thought of as secondary to basic ATLS resuscitation¹.

In the setting of possible inhalational injury or facial and neck burns airway management must be done aggressively and early. Even in absence of specific airway issues, major burns often require airway control and mechanical ventilation as an adjunct to hemodynamic optimization and pain management.

Although early fluid resuscitation is generally guided by the Parkland Formula (2-4 ml/kg x BSA of burn injury over the first 24 hours post-injury, with half administered in the first eight hours), this is an estimate, and should be regarded in the context of urinary output, the patient's other injuries, and co-morbidities. Management of patients with large burn wounds is complex, hence the urgency of delivering the patient to a facility with experience in burn management.

- B. *With rare exceptions, initial burn wound care amounts to a) arresting the burning process, and b) applying clean, dry dressings.*

Wound care is generally a secondary concern in the first hours of burn management². Especially in chemical burns, removal of contaminants and irrigation may be necessary to stop the burning; but having accomplished that, it suffices to protect the burns with loose, clean dressings. This saves time – both in preparing the patient for transfer, and in evaluating the injuries on arrival at the tertiary hospital.

For full-thickness burns, especially circumferential burns of the extremities and trunk, early escharotomy³ may be vital to outcome. Providers who are not experienced in the procedure should consult a surgeon before proceeding.

- C. *An estimate of affected total body surface area (TBSA) is important to triage and treatment. Burns over 20% TBSA in adults or 10% TBSA in children should be treated at a hospital that specializes in burn care. Many smaller burns, especially those involving face, hands, feet, or perineum should also be managed at a hospital that specializes in burn care.*

Estimating the injured body surface area is important to resuscitation (as above), communication along the treatment path, and trauma- or burn-center triage. Various methods, charts and tools can be used for TBSA calculations⁴ but a rough drawing of burn area and estimated depth is an important part of initial documentation. Each method of estimation has its advantages and disadvantages, so providers should choose and practice a preferred method. A “rule of nines” diagram is included in the References.

Two points may be helpful: the palm of the patient's hand is a reasonable estimate of 1% TBSA; and superficial or first-degree burns (where the epidermis is intact and unblistered) are *not included in the calculation*.

The ABA Criteria for Burn Transfer are admittedly liberal, but serve as a workable minimum for consideration⁵. Transfer of smaller burns is often appropriate, even only to facilitate outpatient care. A summary of the ABA criteria follows. Note that there are three simple thresholds for TBSA: five, ten, and twenty per cent:

1. Full-thickness burns greater than 5% of the body surface area in any patient.
2. Partial- or full-thickness burns greater than 10% of the body surface area in any patient under 10 or over 50 years of age.
3. Partial- or full-thickness burns greater than 20% of the body surface area in any patient.
4. Partial- or full-thickness burns involving face, hands, feet, genitalia, perineum, or major joints in any patient.
5. Electrical burns, including lightning strikes.
6. Chemical burns meeting the above criteria.
7. Inhalation injury, with or without cutaneous burns.
8. Burns in patients with significant comorbidity.
9. Burns in patients with other significant injuries.
10. Burns in children.
11. Burns in patients who will have special rehabilitation requirements.

D. *Patients with large burns or burns involving functional areas mentioned above are critically ill and should be discussed with a trauma surgeon at the regional trauma center to discuss care needs and facilitate transfer regardless of ultimate destination.*

With the relatively low (and gradually declining⁶) incidence of major burn injuries, local expertise in burn care may be limited. All but the most simple injuries should be treated in consultation with a center experienced in burn care. Maine's three regional trauma centers have all have useful experience with burn injuries. Attending trauma surgeons are well integrated not only with their in-state peers, but also with burn service colleagues in Boston. The initial consultations for burns should default to those used in any major trauma. Their staff can guide referring hospital staff in patient care and selecting the appropriate resource for further treatment referral.

E. The burn patient treatment referral resources suggested by regional trauma center staff may include the trauma centers themselves, the Burn Service at Maine Medical Center (it has the capability to treat adult burns up to about 50% TBSA in adults and 20% TBSA in children), and burn centers in Boston. The majority of patients injured in Maine can be treated without transfer out of

state, however, patients with large or complex burns will likely receive their care at a center in Boston (e.g. Shriners Hospital has a children's free burn service), however the regional trauma centers are excellent resources for triage, stabilization, and critical care transfer. .

Part III: References

- ¹ American College of Surgeons, Advanced Trauma Life Support. Chicago IL.
- ² <http://www.umm.edu/ency/article/000030trt.htm>
- ³ <http://emedicine.medscape.com/article/80583-overview>
- ⁴ <http://www.burnsurgery.org/Modules/orders/sec2.htm>
- ⁵ <http://traumaburn.org/referring/aba.shtml>
- ⁶ Clark DE, Dainiak CN, Reeder S. Decreasing incidence of burn injury in a rural state. Inj Prev 2000; 6:259-262.

