

Burn Clinical Practice Guideline

Developed by
Texas EMS Trauma & Acute
Care Foundation Trauma Division



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CONTENT

The content for this publication was developed by the TETAF Trauma Division, led by Rose Marie Bolenbaucher, M.S.N., RN, TCRN, through collaboration with Texas Trauma Program Managers and Texas Burn Center program leadership to provide guidance to hospitals in Texas. The content was reviewed and edited by Dr. Brian Eastridge and the GETAC Trauma Systems Committee Trauma Medical Directors Workgroup. This document is intended to be used as guidance only in the development of burn treatment policies and protocols within hospitals in Texas. This is a living document that will be reviewed annually and updated as needed to maintain the standards of care set by national evidence-based findings.

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Burn Clinical Practice Guideline

Treatment of burns is not always straightforward. National and international guidelines differ from one region to another. However, all sources agree that managing burn cases in the first 24 hours is critical and directly correlates to morbidity and mortality.

To deliver optimal patient care to burn victims, health care providers must understand the pathophysiology of burn injuries, their classification, the appropriate use of various types of surgical treatment and the latest updates in burn science. Some patients may be treated effectively in the hospital emergency department while others may require hospitalization or stabilization/transfer to a burn center as quickly as possible.

The clinical situation for treating burn cases needs clear guidelines to cover all aspects of care during the treatment process. Through a collaboration of Texas verified burn centers and the Texas EMS Trauma & Acute Care Foundation (TETAF), this publication was created to provide clinical practice guidelines for hospitals in Texas for assessing, classifying and treating the patient experiencing a burn injury. Utilization of these guidelines provides the framework to develop burn care policies in Texas hospitals and ensure consistent, appropriate care for burn patients across the state.

Publication Objectives

TETAF's goals with this publication include the following:

1. Provide resources and references for burn care in Texas based on nationally accepted standards of care.
2. Provide guidelines and assistance for the development of policies and ensure consistent practice across Texas for all burn patients.

3. Address guidelines systematically and include:

- a) ABCDE as in all types of trauma cases,
- b) Fluid resuscitation,
- c) Wound care,
- d) Pain management,
- e) Transfer guidelines, and
- f) Psychosocial and spiritual support.

Treatment Protocol Considerations

All trauma cases – including patients with burn injuries – should be treated by initially following the guidelines for Advanced Trauma Life Support to ensure that life-threatening injuries are addressed immediately. ABCDs first! The appropriate assessment and management of burn patients in the first hours following injury have resulted in the 96 percent national survival rate for patients transferred to a verified burn center in 2011, as reported by Advanced Burn Life Support.

This publication provides information and guidance in developing policies for treating burn patients. Information is presented in the order in which assessment/care should be provided. After addressing the ABCDs of life support, focus turns to burn injuries. Replacing fluid lost from the burns is critical, and an accurate assessment of the severity and extent of the burns is needed to calculate the amount of fluid to provide. Wound care and pain management are addressed next. Many of these activities are occurring almost simultaneously, especially if the extent of the burn injuries indicates transfer to a burn center is needed. Psychosocial and spiritual support may be provided throughout the assessment, treatment and stabilization processes.

Advanced Trauma Life Support Process/Assessment

Airway with C-Spine Protection

As in all trauma cases, early recognition of airway compromise followed by prompt intervention to ensure airway maintenance should be completed. If there is soot in the mouth, consider early intubation even if the patient is breathing normally. Follow ATLS guidelines and ensure the patient has a definitive airway established and continue assessments to monitor ventilation. Assessment of the airway includes:

- Removing any burning agent, including chemicals.
- Inspecting for singed nasal, facial and eyebrow hairs.
- Looking for burns and edema around the head and neck.
- Determining if there are circumferential burns to the chest which may inhibit ventilation and require escharotomy.

Breathing

Determine if the patient is moving air or not. Follow ATLS guidelines. Assessment of breathing includes:

- Auscultating breath sounds,
- Monitoring rate, depth and work of breathing, and
- Monitoring for dyspnea and stridor.

Circulation

Monitor circulation and cardiac status with hemorrhage control. Obtain appropriate vascular access and use a device to monitor heart rate and blood pressure. Cannulate two veins with large caliber intravenous catheters and initiate warmed fluids. Avoid burned areas when possible. In large burns where the IV has been placed through burned skin, the IVs should be sutured. Insert intravenous catheters to initiate intraosseous infusion when unable to obtain vascular access. (Note: Fluid resuscitation continues in the next column and recommendations by specific burn centers are discussed on pages 12 and 13.)

Ongoing fluid requirements are adjusted based on the individual patient's response to the resuscitation as evidenced by urinary output in addition to hemodynamic parameters.

Assess perfusion status by the following techniques:

- Pulse check,
- Capillary refill, and
- Urinary output (see additional parameters in the section Determination of Total Body Surface Area, below and on page 6).

Disability

Detect if there are any manifestations of neurological deficits.

Exposure

Evidence-based research supports total exposure of the patient to assess the severity of burns and initiate treatment.

- Remove any burning agent, including chemicals.
- Work toward maintaining a normal temperature by removing wet dressings and covering with dry, sterile dressings.
- Begin re-warming the patient with blankets and warmed fluid. Ambient temperature should be from 28° to 32°C (82° to 90°F). The patient's core temperature must be kept at least above 34°C. Increase the room temperature if necessary.
- Remove all jewelry.

Fluid Resuscitation

Fluid resuscitation is a mainstay in the treatment of burn patients. The guidelines of Advanced Trauma Life Support should be followed to maintain perfusion. Verified burn centers in different areas of Texas follow different guidelines with respect to fluid resuscitation though the underlying principle of maintaining end organ perfusion are the same.

Determination of Total Body Surface Area

The severity of a burn injury is determined by the total body surface area burned and the depth of the burn. Total body surface area (TBSA) is an assessed measure of the severity of skin burns. In adults, the "Rule of Nines" is used to determine the total percentage of the burned area for each major section of the body. However, this rule cannot be used in pediatric burns.

The Lund-Browder chart is one of the most accurate methods to estimate not only the size of the burn area but also the burn degree in both adult and pediatric burn patients. This chart is widely used in clinical practice. The Lund-Browder chart is available in many burn centers and on the Internet; see the Education Recommendations on page 15 of this publication for more information.

An accurate determination of the size of the burned areas is essential to estimate the amount of intravenous fluids required and the appropriateness of transfer to a burn unit. The degree of burns also is calculated to estimate the prognosis as well as the type of treatment.

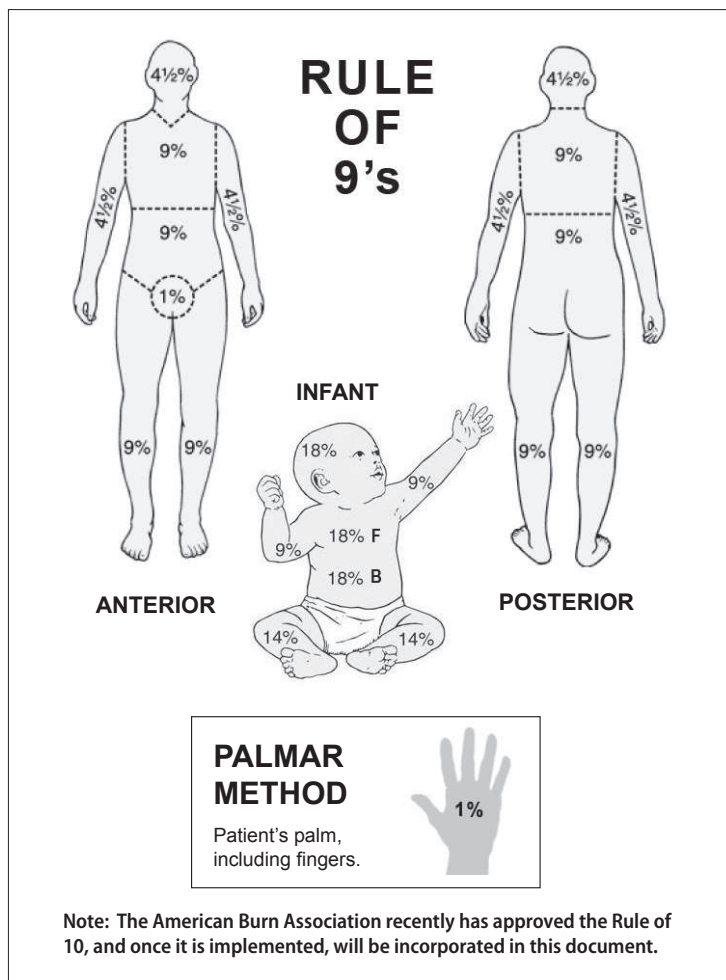
Percentage of Total Body Surface Area

Clinicians should determine the total body surface area affected by the burn by using the formula derived from the Rule of Nines, the Berkow formula or the Lund-Browder chart. The rule of palms can be used to measure the extent of small or scattered burns. The patient's hand (including fingers) is equal to 1 percent of TBSA.

Burn Classification or Severity

A visual assessment should be made to determine the severity of the burn injuries. The thickness of the burn – how many layers of skin as well as the amount of other tissue damaged – is used to classify the degree of the burn. The classification levels of burns include the following degrees:

- First degree burns – Redness and pain of the affected skin. Minor epithelial damage occurs without formation of blisters. Typically occurs with sunburns.
- Superficial second degree burns (superficial partial thickness burns) – Complete epithelial damage and only papillary dermal damage occurs. This degree leaves no neurovascular damage. It causes pain, bleeds and presents with blisters. Epithelial repair occurs within 14 days, and mostly leaves no scars after healing. Sometimes discoloration remains.
- Deep second degree burns (deep partial thickness burns) – Complete epithelial damage and damage of the reticular dermis are present. Blisters also can be present but are bigger than in superficial second degree



- burns. Healing can occur but takes longer than 14 days.
- Third degree burns (full thickness burns) – The epidermis, dermis and subcutaneous tissue are involved. The skin appears white and/or leathery with thrombosed vessels.
- Fourth degree burns – This classification may be used when a burn involves the underlying fascia, muscles and even bones.

Brief Categorization of Burns

Full thickness burns are more severe than those that damage only partial layers of skin. For purposes of determining the percentage of total body surface area burned, only partial and full thickness burns are used. Correlating with the degree classification are these categories of burns by thickness of damage:

- Superficial burn injury (first degree);
- Superficial partial-thickness burns (superficial second degree);
- Deep partial-thickness burns (deep second degree);

- Full-thickness burns (third degree); and
- Full-thickness burns involving the underlying fascia, muscles and bones (fourth degree).

Burn History

Once the ABCDs are completed and fluid resuscitation has been initiated, attention should be focused on obtaining information about how the burn injury occurred. This burn history should include:

- The patient's or EMS provider's history of the events,
- Time of injury,
- Where the injury occurred including if the patient was in an enclosed space,
- If there was loss of consciousness,
- Causative agent/mechanism of burn,
- How long the patient was exposed to the burn source,
- If decontamination occurred,
- Suspicion of abuse or intentional injury,
- Possibility of carbon monoxide intoxication based on the history of burns in a closed area as well as the presence of soot in the mouth and nose,
- Presence of facial burns, if applicable,
- Examination of the cornea,
- Consistency of burn with the history provided,
- Allergies and usual medications,
- Past medical history including the date of the last tetanus shot, and
- The patient's weight.

Diagnostics/Basic Laboratory Tests

Basic laboratory tests may include but are not limited to the following:

- Complete blood count (CBC) and arterial blood gas (ABG) analysis,
- Urea and electrolytes (U&E), also known as basic metabolic profile,
- Prothrombin time (PT) / Partial thrombin time (PTT) and International Normalized Ratio (INR) should be considered if the patient is on anticoagulants,
- Blood glucose level,



First Degree Burn

- Urine drug test, and
- Human chorionic gonadotropin (B-HCG) if the patient is female.

Consider Special Circumstances

Patient characteristics as well as the cause of the burn injury may require special considerations in the assessment as well as the treatment of the patient. Age of the burn patient should be taken into account in assessments and treatments. For example, children may be the victims of abuse, and elderly burn patients need to be managed aggressively due to their overall health conditions and co-morbidities. Specific types of burn injuries – such as electrical and chemical burns – also require special interventions.

Pediatric Considerations

If the patient is a child, look for signs of abuse.

Specific things to consider include the following:

- Is the pattern of burn consistent with the story?
- Does the story change?
- Observe the caregiver's behavior and be suspicious if the individual seems disinterested in the child's care.
- Observe interactions – if possible – between the child and caregiver; strange behavior may indicate an unhealthy relationship.
- Scald burns with circumferential demarcation line often indicate an intentional action.
- Accidental burns usually have splatter marks and inconsistent edges.



Non-Accidental Burn

Additional Pediatric Considerations

Burn-related injuries are a leading cause of morbidity and mortality in children and rank third in children age 1 - 9 years. Appreciating the major differences between burn management in children and adults is important. With nearly three times the body surface area (BSA) to body mass ratio of adults, fluid losses are proportionately higher in children than adults and predispose the child to

hypothermia which must be aggressively avoided. Be sure to address appropriate fluid resuscitation, hypothermia, pain control and blood glucose level.

- Fluid resuscitation in a child must be more precise. Urinary output is the most sensitive indicator of fluid resuscitation.
- Hypothermia is a continued high risk in this patient population due to the high surface-to-volume ratio and low-fat mass. Hypothermia can increase the depth of the burn.
- Monitor the pediatric patient's blood glucose level. In this patient population, temperature regulation is partially based on non-shivering thermogenesis, which further increases metabolic rate.
- Thrashing, resisting care and dislodging important treatment adjuncts such as catheters, endotracheal tubes, etc., may indicate pain in children who are not able to express pain. Begin with small doses, 0.1 mg/kg of morphine intravenously initially and increase as long as patient remains hemodynamically stable and shows no evidence of respiratory depression.



Accidental Burn

Geriatric Considerations

Advances in medical care and longevity have resulted in an increase in the elderly population, and burn injuries in this subset of the population are becoming more prevalent. With patients 65 years of age and older, the risk of mortality is increased, so early and aggressive management of burns are needed. Thinner skin, poorer circulation, pre-existing conditions, fewer reserves and higher complication rates increase morbidity and mortality. Because of age, thoughtful consideration should be given to treatment, such as:

- Early surgical intervention is recommended.
- Use care in fluid resuscitation so as not to cause fluid overload. Be aware that it may require more fluid to resuscitate the same burn size than expected to avoid hypovolemia, possibly due to the decreased skin turgor.
- Implement aggressive respiratory therapy. Inhalation injury tends to be more prevalent in elderly patients because they are generally less mobile. Inhalation injury is a significant predictor of mortality and is an important comorbidity factor.
- Transfer to a burn center is recommended.
- For optimum outcomes, aggressive rehabilitation is needed.

Electrical Injury Considerations

When the patient's burns were caused by an electrical injury, circumstances dictate special care consideration, including the following:

- Assess cardiac rhythm as life-threatening arrhythmias may be present.
- Assess contact points (it is possible to have more than two).
- Be aware that significant underlying tissue and muscle injury may be present in electrical injuries. If this happens, muscle fibers and chemicals may be released into the bloodstream, causing electrolyte disturbances.
- Assess for myoglobinuria; the presence of these muscle fragments in the urine can cause electrolyte disturbances and kidney failure.

Chemical Injury Considerations

All ERs are required to maintain a reference manual that is updated regularly with chemicals used in their region. Every chemical and the appropriate care for an exposure should be included in the Material Safety Data Sheet (MSDS). This reference should define the appropriate type of emergency care for each chemical in the region that could cause a burn.

With chemical burns, it is important to determine that the patient has undergone decontamination for an appropriate length of time based on the specific recommendations in the MSDS, at least 20 minutes or until the burning process has stopped. If the burn was caused by a chemical agent, providers should take appropriate precautions to protect themselves and the immediate environment from exposure to the chemical agent.

Circumferential Burns Considerations

Burns that encircle an extremity, the chest or the abdomen require special attention. Edema and swelling in the tissue under the burn may cause the burnt skin – which is rigid – to act like a tourniquet. In a limb, this can cause ischemia. In the chest or abdomen, it can restrict chest expansion and diaphragm movement and interfere with ventilation. A burn center surgeon should be consulted prior to treatment.

Among the interventions that typically may be implemented are the following:

- Checking for pulses; often a doppler scan is needed.
- Elevating extremities if not contraindicated.
- Performing an escharotomy – full thickness incision of the burn down to the subcutaneous fat, to release constricting unyielding burned skin. This may be necessary to restore blood flow. However, this optimally should be performed after appropriate consultation with the burn center surgeon.

Additional Considerations for All Types of Burn Patients

Regardless of the patient's age or type of burn, these treatment considerations apply to all burn patients.

- Insert a gastric tube as directed by a physician.
- Monitor urinary output to assess fluid resuscitation by inserting an urinary catheter and monitoring urine output (UOP) for amount and color, using these guidelines:
 - Adults UOP goal is 30 cc/hour.
 - Pediatric UOP goal is 1 cc/kg/hour.
 - Electrical injuries with myoglobinuria UOP goal is 75-100 cc/hour.
- Electrical and inhalation injuries may require additional fluid during resuscitation.
- Elevate the head of the bed 30 degrees.
- Elevate affected extremities.
- Administer a tetanus prophylaxis.

Wound Care

Initially, the burn must be cooled with cool water, not cold and not ice water. Wet dressings put in place in the pre-hospital setting must be removed and replaced with sterile, dry dressings if more than 20 percent of the patient's TBSA is affected. Note that wound care is a low priority in the initial care of a severely burned patient unless covering of the burn with sterile, dry dressing reduces the pain and increases the comfort level of the burn injured patient. It should be noted that wound care should not be attempted until well after the patient's airway, breathing and circulatory status have been addressed.

Follow these general guidelines but always ask the receiving burn center for its preferences prior to initiation of wound care:

1. If more than 10 percent of the patient's TBSA is affected, cover with a clean, dry sheet or dressings.
2. If more than 20 percent of the patient's TBSA is injured, cover with a clean dry sheet or dressings, and remember to keep the patient warm with blankets or by increasing the room temperature to 90 degrees.
3. If less than 10 percent of the patient's TBSA is affected, saline moistened sterile dressings may be applied.

Pain and Anxiety Management

Pain from burns can be excruciating. Covering the burns, warming the patient, elevating burned extremities and pharmacological pain control should be considered.

Anxiety is different from pain and may be controlled with benzodiazepines.

Remember, the body surface area has been damaged. Intramuscular and subcutaneous routes should not be used due to fluid volume changes and unpredictable blood flow/absorption. Tetanus is the only medication given intramuscularly in burn patients. Intravenous pain medication should be



Third-Degree Burn

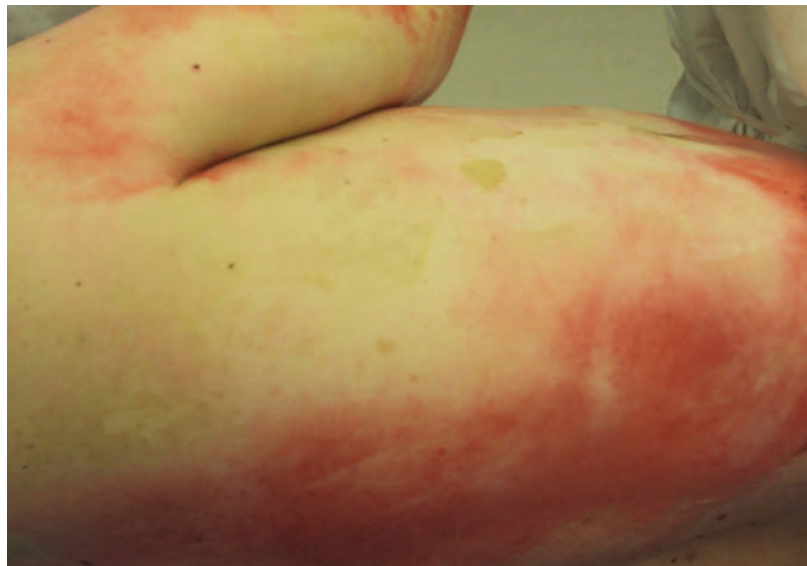
measured and adjusted to provide relief to the patient, although careful monitoring of the patient's respiratory status is required.

Burn Center Referral Criteria

Does the patient meet the criteria for injuries requiring referral to a designated burn unit? A clear answer should be given in the pre-hospital setting, and the assessment must be performed by the referring physician or the transporting physician. Depending on the patient's location, proximity to a burn unit and capacity of the burn unit to accept a patient transfer, initial treatment should be initiated in the emergency room until transport to the burn unit takes place. A burn center may treat adults, children or both.

Patients with the following burn injuries should be referred to a burn center based on the following criteria excerpted from the American Burn Association's website at www.ameriburn.org.

- Partial thickness burns greater than 10 percent of the patient's TBSA.
- Burns that involve the face, hands, feet, genitalia, perineum or major joints.
- Third-degree burns in any age group.
- Electrical burns, including lightning injury.
- Chemical burns.
- Inhalation injury.
- Burn injury in patients with pre-existing medical disorders that could complicate management, prolong recovery or affect mortality.
- Any patient with burns and concomitant trauma (such as fractures) in which the burn injury poses the greatest risk of morbidity or mortality. In such cases, if the trauma poses the greater immediate risk, the patient initially may be stabilized in a trauma center before being transferred to a burn unit. Physician judgment will be necessary in such situations and should be in concert with the regional medical control plan and triage protocols.



Third-Degree Burn

- Burned children in hospitals without qualified personnel or equipment for the care of children.
- Burn injury in patients who will require special social, emotional or rehabilitative intervention.

Psychosocial and Spiritual Support

Psychological distress occurs in most survivors of severe burn injuries. Although the hospital may be limited in providing professional support due to the short time the patient remains in the emergency center, the caregiver should remain aware of the patient's psychosocial status and provide support as indicated. While each individual experiences psychological distress differently, people with burn injuries may report:

- Feeling sad, anxious or irritable,
- Feeling helpless,
- Feeling hopeless,
- Feeling alone,
- Being concerned about potential changes in lifestyle, appearance, physical limitations, etc., and
- Feeling sad or angry about the loss of property, loved ones or pets.

Examples of Fluid Resuscitation and Wound Care Protocols

Fluid resuscitation recommendations vary in verified burn centers in Texas. Facilities in different geographic locations in Texas should follow the recommendations of their regional tertiary burn center.

Parkland Burn Center, Dallas

Hotline: 214/590-6690

FLUID RESUSCITATION

Follow Advanced Burn Life Support recommendations. If available, titrate fluid up or down in response to urinary output via foley catheter.

Pediatric:

3 ml LR x patient's body weight in kg x % TBSA second- and third-degree burns

Pediatric High Voltage Electric Burns:

4ml LR x patient's body weight in kg x % TBSA second- and third-degree burns

Adult:

For thermal and chemical burns: 2 ml LR x patient's body weight in kg x % TBSA second- and third-degree burns

Adult High Voltage Electrical Burns:

4ml LR x patient's body weight in kg x % TBSA second- and third-degree burns

Geriatrics:

2 ml LR x patient's body weight in kg x % TBSA second- and third-degree burns

Timothy J. Harnar Burn Center – UMC Health System, Lubbock

Hotline: 800/345-9911

FLUID RESUSCITATION

Follow Advanced Burn Life Support recommendations.

Pediatric:

3 ml LR x patient's body weight in kg x % TBSA second- and third-degree burns

Pediatric High Voltage Electric Burns:

4ml LR x patient's body weight in kg x % TBSA second- and third-degree burns

Adult:

For thermal and chemical burns: 2 ml LR x patient's body weight in kg x % TBSA second- and third- degree burns

Adult High Voltage Electrical Burns:

4ml LR x patient's body weight in kg x % TBSA second- and third-degree burns

Geriatrics:

Same as adults.

WOUND CARE

For all burns regardless of size – cover the burn injury with a clean dry sheet or dressing.

Burn Unit – San Antonio Medical Center

Hotline: 210/916-4141

FLUID RESUSCITATION

Pediatric:

2-4 ml per kg x TBSA with UOP goal of 0.5 ml – 1 ml per kg/hour

Pediatric High Voltage Electric Burns:

2-4 ml per kg x TBSA with UOP goal of 0.5 ml – 1 ml per kg/hour

Adult:

2-4 ml per kg x TBSA with UOP goal of 30 ml/hour

Adult High Voltage Electrical Burns:

2-4 ml per kg x TBSA with UOP goal of 75-100 cc/hour; if myoglobinuria present, may require additional fluid during resuscitation.

Geriatrics:

2-4 ml per kg x TBSA with UOP goal of 30 ml/hour

WOUND CARE

1. **No** wound care if the patient is being transferred to a burn center within 24 hours. If unable to transfer, then contact local burn center.
2. If less than 10 percent of the patient's TBSA, saline-moistened sterile dressings may be applied.
3. If more than 10 percent of the patient's TBSA, cover with clean dry sheet.
4. If greater than 20 percent of the patient's TBSA, cover with a clean dry sheet and remember to keep the patient warm with blankets or by increasing the room temperature to 90 degrees.

UTMB Galveston Blocker Burn Unit

Hotline: 800/962-3648

FLUID RESUSCITATION

Per 2010 Advanced Burn Life Support guidelines for burns greater than 20 percent of the patient's TBSA.

Pediatric *prehospital*:

> 5 years old: 125 cc/hour LR

6-13 years old: 250 cc/hour LR

14 years and older (adult rate): 500 cc/hour LR

If patient is less than 10 kg, use D5LR

Pediatric High Voltage Electric Burns:

Consult Shriners Hospital at 409/770-6773

Adult *prehospital*:

500 cc/hour of LR

Adult High Voltage Electrical Burns *prehospital*:

500 cc/hour of LR

Geriatrics: *prehospital*:

500 cc/hour of LR

WOUND CARE

Cover with clean dry sheet or dressings. Keep warm.

Forms and Tools for Documentation

There are many accessible resources for forms and tools that a hospital may use for documentation models. The following information is provided as a guideline and should be considered recommendations only.

Assessment Charts

The Rule of Nines is used to assess the percentage of burn injuries and is used to help guide treatment decisions including fluid resuscitation and becomes part of the guidelines to determine transfer to a burn unit. Having a Rule of Nines chart is recommended; see Appendix A. The Rule of Nines is recommended for initial burn resuscitation prior to burn center transfer. The Lund-Browder chart is recommended after initial burn care and debridement.

Burn Care Sheet

Use a Burn Care Sheet, a tool to travel with the patient for the first 24 hours of care. An example is provided as Appendix B. Hospitals also may use one developed by their facility's team or their RAC.

Performance Improvement Patient Safety (PIPS)

As with trauma, the care of burn patients should receive a very robust review of standards, protocol utilization, documentation, fluid resuscitation and outcomes. The burn review within PIPS must include additional quality filters to ensure the standard of care is met.

Performance Measures by Phases of Care

Prehospital Phase:

- Definitive airway management during resuscitative phase provided
- IV started, intake and output monitored
- Burn care provided
- Scene time, transport time and destination appropriate

- Documentation of fluid volume should start at point of injury to reinforce the 24-hour flow sheet.

Resuscitation Phase:

- All burn patients with second- or third-degree burns had a burn flow sheet.
- All burn patients meeting criteria had a definitive airway established.
- All burn patients with TBSA of 20 percent or more had nasogastric or progastric tube placed.
- Wound care provided as per recommendations of receiving burn center.
- Warming efforts documented.
- Serial vitals, including a temperature, documented.
- Volume of resuscitation fluid required for optimal patient response during the first 24 hours was appropriate based on:
 1. TBSA percentage calculation,
 2. Fluid resuscitation formula appropriately executed and documented including bolus and maintenance fluid resuscitation,
 3. Resuscitation success/failure monitored based on hemodynamic status and urinary output, and
 4. Intake and output documented on 24-hour burn flow sheet, which traveled with the patient.

Additional Considerations:

- Total length of hospital stay is important for several reasons, including burn bed availability, transfer issues and recognition that in some situations non-burn centers may have to maintain this patient.
- Unanticipated readmissions.
- Mortality.

Education Recommendations

These resources may assist the hospital in developing specific policies and procedures for treating patients with burn injuries. In addition, specific educational programs – both online and in-person – may help clinicians treating burn patients improve their practice.

BURN CARE RESOURCE WEBSITES

American Burn Association

<http://www.ameriburn.org/ablsgeneralinfo.php>

Center for Disease Control & Prevention

<http://www.cdc.gov/masstrauma/factsheets/public/burns.pdf>

<http://www.cdc.gov/mmwr/PDF/wk/mm4237.pdf>

(occupational burns among restaurant workers)

International Society for Burn Injuries

<http://www.worldburn.org/>

National Rehabilitation Information Center

<http://www.naric.com>

Public Domain Files/Resources List

http://docsfiles.com/pdf_burns_care_resources.html

Wound Care Advisor

<http://woundcareadvisor.com/resources/>

EDUCATIONAL PROGRAMMING

The American Burn Association offers three Advanced Burn Life Support program options:

ABLS Provider Course Live® – A two-day in-person hands-on course designed to provide the “how-to” of emergency care of the burn patient; registration is available online.

ABLS Now® – Convenient online course providing burn injury training and education for busy first responders and health care providers.

ABLS Handbook® – The go-to reference guide for comprehensive information on immediate care through the first 24 hours post burn injury.

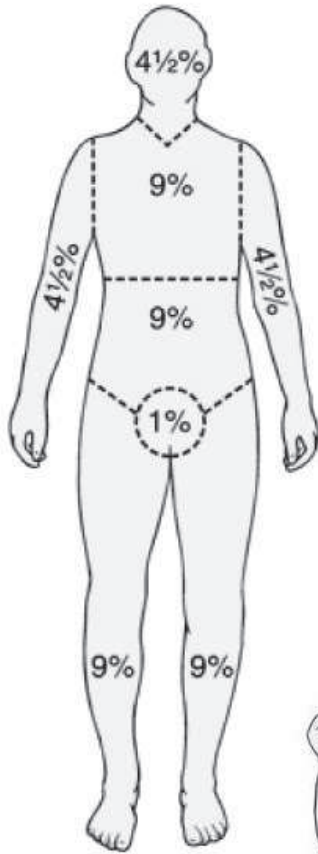
Most burn centers offer outreach education. Contact your local burn center regarding its educational programs.

Appendices

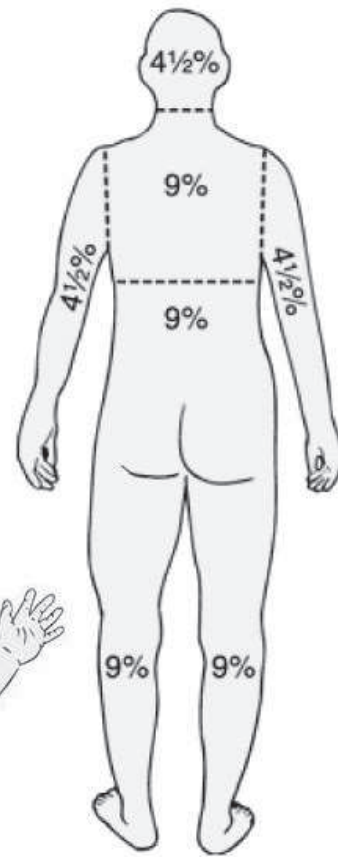
Appendix A: Rule of Nines – Diagram for use in documentation.

Appendix B: 24-Hour Burn Care Sheet – Complete documentation that should travel with the patient.

RULE OF 9's

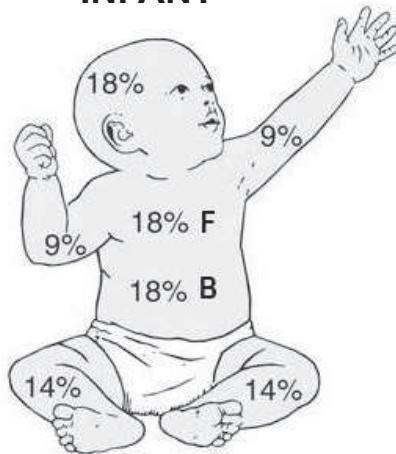


ANTERIOR



POSTERIOR

INFANT



PALMAR METHOD

Patient's palm, including fingers.



Note: The American Burn Association recently has approved the Rule of 10, and once it is implemented, will be incorporated in this document.

> 15% TRAUMA BURN SURFACE AREA BURN RESUSCITATION FLOWSHEET

Date		REFERRING FACILITY								
						Estimated fluid vol. pt should receive				
Name		Identify # DOB or MRN		Pre-Burn est.wt (kg) (a)	% TBSA (b)	2-4 ml x a (kg) x b (TBSA) = TOTAL ml/24 hrs (____) 24 hr total ÷ 2 = TOTAL ml (____) for 1st 8 hrs				
Date & Time of Injury						Burn Center Name:				
Provider Initials & Care Team	Initial hour from burn	Time	Crystalloid	Colloid	Total	UOP	Base Deficit	BP	Pressors	
	1st									
	2nd									
	3rd									
	4th									
	5th									
	6th									
	7th									
	8th									
Total Fluids:										
	9th									
	10th									
	11th									
	12th									
	13th									
	14th									
	15th									
	16th									
	17th									
	18th									
	19th									
	20th									
	21st									
	22nd									
	23rd									
	24th									
Total Fluids:										
Initials: _____		Name/Title: _____				Date: _____				
Initials: _____		Name/Title: _____				Date: _____				
Initials: _____		Name/Title: _____				Date: _____				

Regardless of which ever formula or solution type utilized for resuscitation - assessment of fluid resuscitation UOP must be monitored (Adult UOP goal: 30ml/hr and Pedi UOP goal is 0.5ml - 1ml/kg)

<div style="text-align: center;">> 15 % TBSA BURN REUSCITATION FLOWSHEET</div>									
Date	1 REFERRING FACILITY			2					
				Estimated fluid vol. pt should receive					
Name	Identity# DOB or MRN	Pre-Burn est.wt (kg)	% TBSA	2-4 ml x a (kg) x b (TBSA) = TOTAL ml/24 hrs (____) 24 hr total ÷ 2 = TOTAL ml (____) for 1st 8 hrs					
3		4		5		6		7	
Date & Time of Injury		8			Burn Center Name:				
9	10	11	12	13	14	15	16	17	18
Provider Initials & Care Team	Initial hour from burn	Time	Crystalloid	Colloid	Total	UOP	Base Deficit	BP	Pressors
	1st								
	2nd								
	3rd								
	4th								
	5th								
	6th								
	7th								
	8th								
Total Fluids:					19				
	9th								
	10th								
	11th								
	12th								
	13th								
	14th								
	15th								
	16th								
	17th								
	18th								
	19th								
	20th								
	21st								
	22nd								
	23rd								
	24th								
Total Fluids:					20				
21									
Initials: _____ Name/Title: _____ Date: _____									
Initials: _____ Name/Title: _____ Date: _____									
Initials: _____ Name/Title: _____ Date: _____									

- (1) **Date:** Today's date
- (2) **Referring Facility:** There this form was initiated
- (3) **Name:** Patient's Name
- (4) **Identity/DOB/MRN** - self explanatory
- (5) **Weight in Kg:** Estimated weight PREBURN "dry weight"
- (6) **% TBSA:** area burned
- (7) **Calculation** of individualized RAC Burn Center Policy: Total fluids calculated for the 1st 24 hrs and the 1st 8 hrs
- (8) **Date & Time of Injury:** Date & time of burn. Not the time pt arrived to your facility
- (9) **Provider Initials & Care Team:** Initial of provider and name of Care Team i.e., AirLIFE
- (10) **Initial hour from burn:** 1st hour of post-burn i.e., Pt burned 2 hrs prior arrival, facility will start charting for pt on the 3rd hour.
- (11) **Local Time:** time being used by recorder
- (12) **Crystalloid (ml):** total of crystalloid volume give over last hour
- (13) **Colloid (ml):** total of colloid volume given over the last hour i.e., Albumin, blood
- (14) **Total:** Total volume (crystalloid + colloids) for that hour
- (15) **UOP:** Urine output for last for last hour
- (16) **Base Deficit:** self explanatory
- (17) **BP:** Systolic BP/Diastolic BP
- (18) **Pressors:** Vasopressin, Levophed with rate and dose
- (19) **Total Fluids:** 8 hour total of Crystalloid and Colloid fluid. For Pedi - resuscitation fluids does not replace maintenance fluid requirements for pediatric patients
- (20) **Total Fluids:** 24 hour total of Crystalloid and Colloid Fluid
- (21) **Initials/Name & Title/Date:** Legible initials and signature of provider documenting this flowsheet

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