



# Thermal Burn

## History

- Type of exposure (heat, gas, chemical)
- Inhalation injury
- Time of Injury
- Past medical history and Medications
- Other trauma
- Loss of Consciousness
- Tetanus/Immunization status

## Signs and Symptoms

- Burns, pain, swelling
- Dizziness
- Loss of consciousness
- Hypotension/shock
- Airway compromise/distress could be indicated by hoarseness/wheezing

## Differential








- Superficial (1<sup>st</sup> Degree) red - painful (Don't include in TBSA)
- Partial Thickness (2<sup>nd</sup> Degree) blistering
- Full Thickness (3<sup>rd</sup> Degree) painless/charred or leathery skin
- Thermal injury
- Chemical – Electrical injury
- Radiation injury
- Blast injury

Assess Burn / Concomitant Injury Severity

**< 5% TBSA 2<sup>nd</sup>/3<sup>rd</sup> Degree Burn**  
No inhalation injury, Not Intubated,  
Normotensive  
GCS 14 or Greater  
Minor Burn

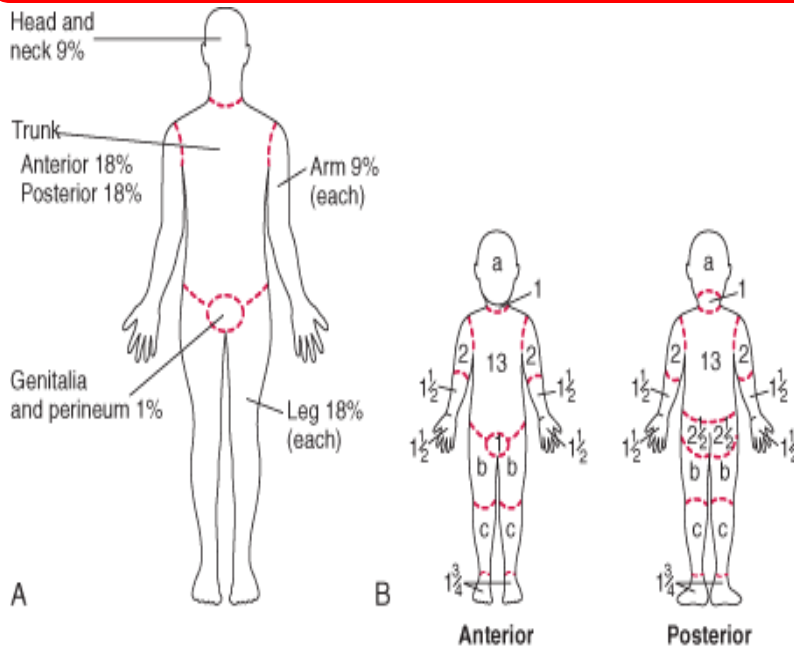
**5-15% TBSA 2<sup>nd</sup>/3<sup>rd</sup> Degree Burn**  
Suspected inhalation injury or requiring  
intubation for airway stabilization  
Hypotension or GCS 13 or Less  
(When reasonably accessible,  
transport to a Burn Center)  
Serious Burn

**>15% TBSA 2<sup>nd</sup>/3<sup>rd</sup> Degree Burn**  
Burns with Multiple Trauma  
Burns with definitive airway  
compromise  
(When reasonably accessible,  
transport to a Burn Center)  
Critical Burn

	Airway Protocol(s) AR 1, 2, 3, 5, 6 <b>as indicated</b>	
	Multiple Trauma Protocol TB 6 <b>if indicated</b>	
	Remove Rings, Bracelets / Constricting Items	
	Dry Clean Sheet or Dressings	
<b>A</b>	IV / IO Procedure Consider 2 IV sites if greater than 15 % TBSA	
	<b>Normal Saline</b> <b>0.25 mL / kg ( x % TBSA ) / hr</b> for up to the first 8 hours. <b>(More info below)</b> <b>Lactated Ringers if available</b>	
	Pain Control Protocol UP 11 <b>if indicated</b>	
	Carbon Monoxide / Cyanide Protocol TE 2 <b>if indicated</b>	
	Monitor and Reassess	
<b>Rapid Transport</b> to appropriate destination using <b>Trauma and Burn:</b> <b>EMS Triage and Destination Plan</b>		
		
	<b>Notify Destination or Contact Medical Control</b>	

1. Lactated Ringers preferred over Normal Saline. Use if available, if not change over once available.
2. Formula example; an 80 kg (196 lbs.) patient with 50% TBSA will need 1000 cc of fluid per hour.

# Thermal Burn



Relative percentage of body surface area (% BSA) affected by growth

	Age				
Body Part	0 yr	1 yr	5 yr	10 yr	15 yr
a = 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2
b = 1/2 of 1 thigh	2 3/4	3 1/4	4	4 1/4	4 1/2
c = 1/2 of 1 lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4

## Rule of Nines

- Seldom do you find a complete isolated body part that is injured as described in the Rule of Nines.
- More likely, it will be portions of one area, portions of another, and an approximation will be needed.
- For the purpose of determining the extent of serious injury, differentiate the area with minimal or 1<sup>st</sup> degree burn from those of partial (2<sup>nd</sup>) or full (3<sup>rd</sup>) thickness burns.
- For the purpose of determining Total Body Surface Area (TBSA) of burn, include only Partial and Full Thickness burns. Report the observation of other superficial (1<sup>st</sup> degree) burns but do not include those burns in your TBSA estimate.
- Some texts will refer to 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> degree burns. There is significant debate regarding the actual value of identifying a burn injury beyond that of the superficial, partial and full thickness burn at least at the level of emergent and primary care. For our work, all are included in Full Thickness burns.
- Other burn classifications in general include:
  - 4<sup>th</sup> referring to a burn that destroys the dermis and involves muscle tissue.
  - 5<sup>th</sup> referring to a burn that destroys dermis, penetrates muscle tissue, and involves tissue around the bone.
  - 6<sup>th</sup> referring to a burn that destroys dermis, destroys muscle tissue, and penetrates or destroys bone tissue.

Estimate spotty areas of burn by using the size of the patient's palm as 1 %

## Pearls

- Recommended Exam: Mental Status, HEENT, Neck, Heart, Lungs, Abdomen, Extremities, Back, and Neuro**
- Green, Yellow and Red in burn severity do not apply to the Start / JumpStart Triage System.**
- Critical or Serious Burns:**
  - > 5-15% total body surface area (TBSA) 2<sup>nd</sup> or 3<sup>rd</sup> degree burns, or
  - 3<sup>rd</sup> degree burns > 5% TBSA for any age group, or
  - circumferential burns of extremities, or
  - electrical or lightning injuries, or
  - suspicion of abuse or neglect, or
  - inhalation injury, or
  - chemical burns, or
  - burns of face, hands, perineum, or feet
- Require direct transport to a Burn Center. Local facility should be utilized only if distance to Burn Center is excessive or critical interventions such as airway management are not available in the field.
- Burn patients are trauma patients, evaluate for multisystem trauma.
- Assure whatever has caused the burn is no longer contacting the injury. (Stop the burning process!)
- Early intubation is required when the patient experiences significant inhalation injuries.
- Circumferential burns to extremities are dangerous due to potential vascular compromise secondary to soft tissue swelling.
- Burn patients are prone to hypothermia - never apply ice or cool the burn, must maintain normal body temperature.
- Evaluate the possibility of geriatric abuse with burn injuries in the elderly.
- Never administer IM pain injections to a burn patient.