Estimating Total Body Surface Area Burns

Sue Heller EMT-B
Ken Heller BSN, EMT-B
Andrea Williams PhD, RN
Objectives

• Quickly estimate total body surface area burned
• Identify depth of burn injuries
• Use American Burn Association Guidelines for estimating IV fluid rates
Rule of Nines & Rule of Palms
Superficial: 1\textsuperscript{st} Degree Burns of Epidermis

- Pink to red
- Painful
- Edematous
- No blisters or eschar
Superficial Partial Thickness  

2\textsuperscript{nd} Degree

- Extends into the upper dermal layer
- Skin pink to red
- Exposed nerve endings = intense pain
- Mild to moderate edema
- Blisters or sloughing skin
- Pseudo-eschar
Deep Partial Thickness Burns

- Extends into deeper layers of derma
- Skin red to pale
- Moderate edema
- Blisters rare
- Soft, dry eschar
- Nerve endings partially destroyed, may experience pressure-like pain
Full Thickness Injuries

- Skin black, brown, yellow, white, or red
- Edema = severe dermal & sometimes into subcutaneous fat
- Pain is minimal d/t nerve endings being destroyed
- Leather-like eschar
Case #1; Kailee was pinned under an ATV that caught fire in Forest County. She was able to crawl out from under it, extinguish then strip off her clothing. (Anterior view of burned areas)
View of burned areas on the back of her body
What was the percent Total Body Surface Area (TBSA) Burned?
Case #2: Ashley was making strawberry jam at the family cabin in Adams Friendship. The golden retriever ran through the kitchen, barking at a raccoon outside, striking Ashley as he ran. She fell forward tipping the pot full of boiling jam onto both hands and wrists. (Anterior view of burned hands & wrists) What percent TBSA burn does she have? What depth?
Posterior view of burned hands & wrists
Case #3: Rosie was trying to light the campfire at her home in Woodruff. The wood was damp & wouldn’t catch. In frustration, she got the gas can out of the shed and threw gas on the wood. An ember ignited the gasoline and vapor causing an explosion. (View of burned areas on the front of her body) What percent TBSA burn does she have? What depth?
Close up view of Rosie’s face, neck chest and upper arm

What is the TBSA Burn? % Full & % Partial Thickness
Case #4: Chloe was drinking & lounging by the pool. No one was in the hot tub, so she put her feet into the water. It was way too hot. The thermostat had malfunctioned. When she pulled her feet out they were red with skin hanging. **What percent TBSA burn does she have? What depth?**
View of burned feet from the front
View of burned feet from the back
Case # 5: Damian squirted ether into the carburetor to try to start the car. The ether ignited causing a flash burn to his face and hair. What percent TBSA burn does Damian have?
Posterior view of Damian’s head
Case # 6: Barbie was going clubbing. Enroute to the club she rolled her pink Corvette. Her legs were pinned when the car ignited. She suffered significant burns (Anterior view of Barbie’s burns) What percent TBSA burn does she have? What depth?
Posterior view of Barbie's burns
Case #7: Zoe was at the fireworks. A mortar misfires and explodes at her feet, melting her leggings & nylon socks. What percent TBSA burn does she have? What depth?
Posterior view of leg & feet burns
Anterior & posterior views of legs & feet
Case #8: Meghan was standing by a campfire. She stumbled over a log and stepped into the fire, catching her pants on fire. (Anterior view)
Posterior view
What is the percent TBSA burn?
Case #9: Charlotte was burning brush on the farm in Mayville. The wind shifted catching her shirt and socks on fire. (Anterior view)
Posterior view of burned areas.
What is the depth & percent of injury?
Case # 10: Tina was sitting at a table at a restaurant in East Troy. A waiter trips, spilling a tureen of soup onto Tina’s lap. She was wearing \( \frac{1}{2} \) tights. (Anterior view of Tina’s burns)
Posterior view of Tina’s Burns
-What is the TBSA?
American Burn Association & UWHC Fluid Resuscitation Guideline
Pre-Hospital or Early Hospital & Burn Unit Settings

2 Large Bore IV’s >15%
Even through burned skin

• 5 years old and younger: 125 ml LR per hour
• 6 – 13 years old: 250 ml LR per hour
• 14 years and older: 500 ml LR per hour
**Key Take-Aways**

- **EMT’s:** Estimating TBSA Guides Fluid Resuscitation
- **Paramedic & RN Pre-Hospital/ED:** American Burn Association Guidelines for Fluid Resuscitation in the Pre-Hospital Setting Prevents Complications of Over Hydration (Pulmonary Edema, Massive Third Spacing & Compartment Syndrome)
- **RN Burn Centers:** Use ABA & Local Fluid Resuscitation Guidelines, Based on Type of Burn, Age of Patient & Delays in Resuscitation. Titrate to Urine Output & Physiologic Response
References

- American Burn Association Provider Manual 2016 Update. American Burn Association, Chicago, IL
- UW Health Emergency Quick Reference for Pre-hospital Providers 2018
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