BURNS – THERMAL / ELECTRICAL

ALL PROVIDERS/EMT

- Scene and patient management
  - Thermal Burns
    - Stop the burning process.
    - Do not pull material out of the wound but cut clothing around it.
  - Electrical Burns
    - Safely evacuate patient from electrical source.
    - Do not touch the patient until you are sure that the electrical source is disconnected.
    - When multiple patients are struck simultaneously by lightning or a high voltage source, those in respiratory and/or cardiac arrest should be given the highest priority of care, even those who appear dead on initial evaluation. These patients may be in ventricular fibrillation and resuscitated with CPR and defibrillation.

- Focused history and physical exam
  - Identify potential entry and exit wounds for electrical burns – both sites will generally be a full thickness burn site.

- Continuous ECG, ETCO2, and Pulse Oximetry monitoring when available.
  - Avoid placing monitor attachments over burned skin if possible.
  - Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

- Treatment Plan
  - If evidence of possible airway burn (singed nasal hair, carbonaceous sputum, hoarse voice, or stridor), consider early, aggressive airway management.
  - Initiate early oxygen therapy with high flow O2, this is critical despite level of respiratory distress.
  - In the unconscious patient, implement spinal motion restriction per the Selective Spinal Immobilization Guidance.
  - If patient in shock, fluid resuscitation as per Shock Guideline.
  - With electrical burns anticipate heart rhythm irregularities.
  - Assess for circulatory compromise from circumferential extremity burns or ventilator compromise from circumferential chest burns.
  - Remove items that may constrict swelling tissue.
  - Estimate size and depth of burn using the percentage chart (below).
  - Dressings: Cover burns with dry dressings.
  - Closely monitor patient’s temperature and prevent hypothermia.
  - Treat for pain and anxiety per the Pain and Anxiety Management Guideline.
  - Burn patients with major trauma should be transported to a trauma center as per the Utah Trauma Field Triage Guideline.
  - Consider air ambulance transportation for long transport times, inability to control pain after maximal doses of analgesics, and airway concerns that might necessitate advanced airway management.
  - Consider transport directly to a designated burn center for the following:
    - Inhalation injuries
    - Partial or Full Thickness (2nd or 3rd degree) burns (>10% BSA in adults and in pediatrics).
    - Circumferential burns
    - Partial or full thickness burns involving face, hands, or genitalia

- Key Considerations
  - Electrical Burns are frequently more serious than they appear.
  - Identifying the source as AC or DC voltage with the amperage will be helpful in the treatment.
  - Consider 12-lead ECG for patients with electrical burns
  - Care for traumatic injuries should precede care for the burn.
  - If patient is initially hypotensive after burn (first hour), it is NOT a result of the burn: strongly suspect underlying trauma.
  - Confusion, agitation, mental status changes or unconsciousness in closed space fires may represent CO or cyanide poisoning: apply 100% NRB oxygen and consider using Cyanokit (if available).
  - Keep patients warm! Patients are prone to hypothermia due to heat loss from the burns.
• Consider Child Abuse as a cause. Circumferential scald burn to hands, feet, buttocks, and genitalia are common burns seen in child abuse (especially in children <5 years old)

• Definitions:
  - Superficial (1st Degree) Burns – red, painful, without blisters.
  - Partial Thickness (2nd Degree) Burns – red, painful/hypersensitive, swollen, with either intact or ruptured blisters.
  - Full Thickness (3rd Degree) Burns – dark, leathery, painless, waxy, and does not blanch.
## ADULT

### AEMT
- Advanced airway, vascular access per **IV-IO Access and Fluid Therapy Guideline**
  - If possible, avoid placing IV through burned skin
- Partial or Full Thickness (2\(^{nd}\) or 3\(^{rd}\) degree) >10\% BSA – Fluid therapy
  - NS 500 cc/hr
  - The ED will begin standard Parkland Formula on arrival

### PARAMEDIC
- Cyanocobalamin (Cyanokit) 5 gm IV over 15 minutes

### PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

### AEMT
- Advanced airway, vascular access per **IV-IO Access and Fluid Therapy Guideline**
  - If possible, avoid placing IV through burned skin
- Partial or Full Thickness (2\(^{nd}\) or 3\(^{rd}\) degree) >10\% BSA – Fluid therapy
  - For age > 2 years (>12 kg) NS 250 cc/hr
  - For age < 2 years (< 12 kg): NS 125cc/hr
  - The ED will begin standard Parkland Formula on arrival

### PARAMEDIC
- Cyanocobalamin (Cyanokit) 70 mg/kg IV over 15 min

### PARAMEDIC
- High voltage electrical injury or direct lightning strike with significant tissue destruction
  - Sodium Bicarbonate 1 mEq/kg (maximum of 100 mEq) in 1000 mL NS wide open

### PARAMEDIC
- High voltage electrical injury or direct lightning strike with significant tissue destruction
  - Sodium bicarbonate per medical control