Chemical and Electrical Burn

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

Signs and Symptoms
- Burns, pain, swelling
- Ocular burns/ vision changes
- Loss of consciousness
- Hypotension/ shock
- Compartment syndrome
- Airway compromise/ distress could be indicated by hoarseness/ wheezing
- Electrical burn may be misleading with small contact/ external burn and major internal injury – burn/ trauma center transport isrecommended

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

Assure Chemical Source is NOT Hazardous to Responders.
Assure Electrical Source is NO longer in contact with patient before touching patient.

Assess Burn/ Concomitant Injury Severity

< 5% TBSA 2nd/3rd Degree Burn	**5-15% TBSA 2nd/3rd Degree Burn**	**>15% TBSA 2nd/3rd Degree Burn**
No inhalation injury, Not Intubated, Normotensive GCS 14 or Greater Minor 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	Burns with Multiple Trauma Burns with definitive airway compromise (When reasonably accessible, transport to a Burn Center) Critical Burn

Age Appropriate
Airway Protocol(s) AR 1, 2, 3, 4, 5, 6, 7
if indicated

IV or IO Access Protocol UP 6
Consider 2 IV sites if ≥ 15 % TBSA

Thermal Burn Protocol TB 9

Pain Control Protocol UP 11
if indicated

Identify Contact Points

Eye Involvement
Irrigate Involved Eye(s) with Normal Saline + for 30 minutes
Continue irrigation during transport

Chemical Exposure/ Burn
Flush Contact Area with Normal Saline for 15 minutes
Continue irrigation during transport

Decontamination Procedure USP 2
if indicated

Age Appropriate Cardiac Protocol(s)
if indicated

Rapid Transport to appropriate destination using
Trauma and Burn:
EMS Triage and Destination Plan

Notify Destination or Contact Medical Control

Trauma and Burn Protocol Section

Chemical and Electrical Burn

Main considerations when encountering a chemical burn:

Emergency Response Guidebook use.

- What is the risk of exposure to the providers?

Triage:

- Scene size-up and assessment to determine number of patients, type and severity of injuries, as well as resources needed on scene.

Assessment:

- Main focus is to limit ongoing injury and determine extent of exposure.
- Remove clothing, flush the area(s) of contamination, and then cover with dry sterile dressings.
- Gross decontamination consisting of removing clothing typically removes the majority of any chemicals. (Nearly 80%)
- Identify the type and nature of the chemical.

Caustics:

- Remove powder by brushing then irrigate and flush copiously.

Acids:

- Irrigation up to 30 minutes is warranted.

Alkali:

- Alkali agents feel slick or soapy.
- May require prolonged irrigation.

Main considerations when encountering an electrical burn:

- Identify electrical source and determine if patient remains in contact with source.
- Electrical source must be disconnected before provider can perform assessment and care.

Potential threats:

- Downed power lines, assume they are energized. The span between 2 power poles is considered a safe distance.
- Lightning

Lightning strikes:

- Reverse triage: Lightning strike victims respond well to basic measures. With more than one victim, institute reverse triage and go to those who appear dead first and deliver CPR unless an injury incompatible with life is determined.
- Victims who are awake and breathing following a lightning strike do not typically worsen acutely.

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.**
- **Refer to Rule of Nines.**
- **Transport and Destination:**
  - **In general, chemical and electrical burns should be transported to a burn center.**
  - **Burn center should be initial destination choice unless EMS system access is limited by time and/ or distance.**
  - **When EMS transport to burn center is limited, transport to and stabilization at local center is appropriate.**
- **Chemical Burns:**
  - Refer to Decontamination Procedure.
  - With dry powders/ substances, gently brush or wipe off prior to irrigation. Do not aerosolize by brushing too vigorously.
  - Normal Saline or Sterile Water is preferred, however if not available, do not delay irrigation and use tap water. Other water sources may be used based on availability.
  - Flush the area as soon as possible with the cleanest, most readily available water or saline solution and use copious amounts of fluids.
  - Flush contact area for a minimum of 15 minutes and continue until arrival at receiving facility.
  - Hydrofluoric acid burns:
    - Monitor ECG for peaked T waves, which can be sign of hypocalcemia.
  - Eye involvement:
    - Irrigation is recommended for a minimum of 30 minutes and continue until arrival at receiving facility.
- **Electrical Burns:**
  - **Remember the extent of the obvious external burn from an electrical source does not always reflect more extensive internal damage. Small external injury may have large internal injury.**
  - **Do not refer to wounds as an entry and exit wound**.
  - **DO NOT contact patient until you are certain the source of the electrical shock is disconnected.**
  - Attempt to locate contact points (generally there will be two or more.) A point where the patient contacted the source and a point(s) where the patient is grounded.
  - Sites will generally be full thickness (3rd).
  - Cardiac Monitor: Anticipate ventricular or atrial irregularity including VT, VF, atrial fibrillation, and/ or heart blocks.
  - Attempt to identify the nature of the electrical source (AC or DC), the amount of voltage, and the amperage the patient may have been exposed to during the electrical shock.
  - **Lightning strike:**
    - Lightning strike victims are amenable to airway, breathing, cardiac compressions, as well as early defibrillation.
    - **Use concept of reverse triage with multiple casualties. Resuscitate lightning strikes as the priority.**
    - Lightning strike victims found alive do not often deteriorate quickly.