

# 11.03 SPECIAL CIRCUMSTANCES: CHEMICAL & RADIOLOGICAL AGENTS

## RADIATION INJURY

<ul style="list-style-type: none"><li>• Burns and / or blast injury.</li><li>• Multiple health issues with lower dose exposures.</li></ul>
<b>BLS Treatment</b>
<ul style="list-style-type: none"><li>• Position of comfort.</li><li>• NPO.</li><li>• Assess circulation, airway, breathing, and responsiveness.</li><li>• <b>Oxygen</b> as indicated.</li><li>• Provide Spinal Motion Restriction as indicated or position of comfort as indicated.</li><li>• Splint suspected fractures/instability as indicated.</li><li>• Bandage wounds/control bleeding as indicated.</li></ul>
<b>ALS Treatment</b>
<ul style="list-style-type: none"><li>• For pain, see Policy 2.09 Pain Control or 8.12 Pediatric Pain Control.</li></ul>
<b>Comments</b>
<ul style="list-style-type: none"><li>• Follow facility radiation exposure plan for patient decontamination and disposal of all contaminated waste.</li><li>• In the nuclear bomb scenario casualty load will be excessive. Utilize austere care protocol and strict triaging to maximize available resources. Access all available disaster resources.</li></ul>

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### CHEMICAL AGENT INJURY: NERVE AGENTS (e.g. VX, Sarin, Soman, Tabun)

<ul style="list-style-type: none"> <li>Causes “SLUDGE” (Salivation, Lacrimation, Urination, Diaphoresis/Diarrhea, Gastric hypermotility, Emesis/Eye (small pupils, blurry vision).</li> <li>Severe exposures may result in decreased level of consciousness, fasciculation/muscle weakness, paralysis, seizures.</li> </ul>		
<b>BLS Treatment</b>		
<ul style="list-style-type: none"> <li>Position of comfort.</li> <li>NPO.</li> <li>Assess circulation, airway, breathing, and responsiveness.</li> <li><b>Oxygen</b> as indicated.</li> <li>Provide Spinal Motion Restriction as indicated or position of comfort as indicated.</li> <li>Appropriately splint suspected fractures/instability as indicated.</li> <li>Bandage wounds/control bleeding as indicated.</li> </ul>		
<b>ALS Treatment</b>		
<ul style="list-style-type: none"> <li>Administer <b>Atropine</b> 2-5 mg IVP/IO. Repeat every 2 – 5 minutes until SLUDGE symptoms subside.</li> <li>For seizures: administer <b>Midazolam</b>.</li> </ul>		
<b>Comments</b>		
<p>Nerve agent poisoning can be very toxic. Large amounts of <b>Atropine/2-PAM</b> may be needed to treat symptoms. If the patient is initially symptomatic and no response is seen to the initial doses of medication, continue giving until a response is achieved. May need to access pharmaceutical disaster cached called, “CHEMPACK” to have sufficient supply of antidote to treat multiple patients. If available, administer <b>DuoDote [Atropine/Pralidoxime (2-PAM)] Autoinjector</b> IM in using dosing table below:</p>		
<b>DuoDote (2-PAM) Dosing Estimator</b> <i>DuoDote = Atropine 2.1mg / Pralidoxime 600mg</i>		
<b>Do NOT Use Atropine/2-PAM Injector</b>	<b>Use Between 1 – 3 Atropine/2-PAM Injectors IM</b>	<b>Use 3 Atropine/2-PAM Injectors IM</b>
<ul style="list-style-type: none"> <li>No signs of life</li> <li>Fits non-resuscitation group (expectant) due to other concomitant injury</li> </ul>	Titrate dose based on 1 or more SLUDGE signs and: <ul style="list-style-type: none"> <li>Elderly</li> <li>Children appearing under age 14</li> <li>Prolonged extrication (may require more than 3 autoinjectors)</li> </ul>	<ul style="list-style-type: none"> <li>Exhibiting 2 or more SLUDGE signs OR</li> <li>Non-ambulatory</li> </ul>

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Bronchospasm and respiratory secretions are the best acute symptoms to monitor response to **Atropine/2-PAM** therapy:

- Decreased bronchospasm and respiratory secretions = getting better.
- No change or increased bronchospasm and respiratory secretions = needs more **2-PAM**.

### MUSTARD (SULFUR MUSTARD)

Blistering agent affecting skin and mucous membranes.

#### BLS Treatment

- Position of comfort.
- NPO.
- Assess circulation, airway, breathing, and responsiveness.
- **Oxygen** as indicated.
- Provide Spinal Motion Restriction as indicated or position of comfort as indicated.
- Appropriately splint suspected fractures/instability as indicated.
- Bandage wounds/control bleeding as indicated.
- Preserve body temperature if blistered area is large.

#### ALS Treatment

- Advanced airway if indicated.

#### Comments

- Liquid or vapor mustard penetrates the skin and mucous membranes and damages cells within minutes of exposure, so decontamination must be done immediately after exposure.
- Mustard agent can be very persistent; all surfaces with potential contamination must be carefully cleaned before considered decontaminated.

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### METHYLENE DIPHENYL ISOCYANATE (MDI), METHYLENE DIISOCYANATE, AND METHYL ISOCYANATE (MIC)

- Strong eye, skin and respiratory tract irritant.
- High concentrations may result in severe respiratory distress and pulmonary edema.

#### BLS Treatment

- Eyes or skin irritation: flush with copious amounts of water as feasible.
- Position of comfort.
- NPO.
- Assess circulation, airway, breathing, and responsiveness.
- **Oxygen** as indicated.
- Provide Spinal Motion Restriction as indicated or position of comfort as indicated.
- Appropriately splint suspected fractures/instability as indicated.
- Bandage wounds/control bleeding as indicated.

#### ALS Treatment

- Advanced airway as indicated.
- Consider needle cricothyroidotomy for laryngospasm if unable to maintain airway with BLS maneuvers or advanced airway procedures.
- IV/IO of **Normal Saline** TKO.
- **Albuterol**
  - For patients with severe refractory bronchospasm who are less than 50 years old and NO history of coronary artery disease or hypertension: administer IM **Epinephrine** (1:1,000)
  - If no response to IM Epinephrine or patient is in extremis: administer IV **Epinephrine** (1:10,000)

#### Comments

- All patients who have had a moderate or high level of exposure (respiratory, GI or Cardiovascular signs or symptoms upon exam by EMS personnel) should be referred to a medical facility for examination and treatment.
- If utilized, the ETT's placement and patency must be maintained at all times.

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### CHLORINE

- Strong eye, skin and respiratory tract irritant.
- High concentrations may result in severe respiratory distress and pulmonary edema.
- Symptoms:
  - **Low dose**—cough, eye irritation & lacrimation, choking sensation
  - **High dose**—hoarseness, wheezing, severe cough, sudden collapse due to laryngospasm

#### BLS Treatment

- Eyes: Flush with copious amounts of water.
- Skin: Flush with copious amounts of water.
- Position of comfort.
- NPO.
- Assess circulation, airway, breathing, and responsiveness.
- Oxygen as indicated.
- Provide Spinal Motion Restriction as indicated or position of comfort as indicated.
- Appropriately splint suspected fractures/instability as indicated.
- Bandage wounds/control bleeding as indicated.

#### ALS Treatment

- Establish IV/IO of **Normal Saline** TKO.
- **Albuterol**
  - For patients with severe refractory bronchospasm who are less than 50 years old and NO history of coronary artery disease or hypertension: administer IM **Epinephrine** (1:1,000)
  - If no response to IM Epinephrine or patient is in extremis: administer IV **Epinephrine** (1:10,000)
- Advanced airway as indicated.
- Consider needle cricothyroidotomy for laryngospasm if unable to maintain airway with BLS maneuvers or intubation.

#### Comments

- All patients who have had a moderate or high level of exposure (respiratory distress or airway symptoms upon exam by EMS personnel) should be referred to a medical facility for examination and treatment.

#### KEY ASSESMENT FINDINGS

- History: Exposure to a greenish-yellow gas with a pungent, acrid odor.

## 11.03 SPECIAL CIRCUMSTANCES: CHEMICAL & RADIOLOGICAL AGENTS

### Cyanide

Blocks O2 use in cell causing cellular asphyxia and death.

#### BLS Treatment

- Position of comfort.
- NPO.
- Assess circulation, airway, breathing, and responsiveness.
- **Oxygen** as indicated.
- Provide Spinal Motion Restriction as indicated or position of comfort as indicated.
- Appropriately splint suspected fractures/instability as indicated.
- Bandage wounds/control bleeding as indicated.

#### ALS Treatment

- Advanced airway as indicated.
- If SBP < 90 mmH, administer IV/IO of **Normal Saline** fluid bolus.
- **Hydroxocobalamin** if available.

#### Comments

- Patients from enclosed space fires are at risk of cyanide poisoning.
- Notify hospital about possible cyanide poisoning and need for Cyanokit antidote.