### RECOGNIZING CHEMICAL TERRORISM-RELATED ILLNESSES

Understanding the potential for chemical terrorism is crucial in preparing for and responding to such events. Symptoms and signs of exposure can be diverse, spanning from respiratory issues to neurological symptoms. Here, we outline key indicators to help in recognizing and diagnosing health effects of chemical terrorism.

#### Table 1. Recognizing and Diagnosing Health Effects of Chemical Terrorism

<table>
<thead>
<tr>
<th>Agent Type</th>
<th>Agent Names</th>
<th>Any Unique Characteristics</th>
<th>Initial Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphyxiant/Choking</td>
<td>- Mustard gas (H) - Nitrogen mustard (HN-1, HN-2, HN-3) - Lewisite (L) - Cyanogen chloride</td>
<td>- Possible cherry red skin - Possible cyanosis - Possible frostbite*</td>
<td>- Possible serious arrhythmias - Hyperthermia and self-injury are largest risks</td>
</tr>
<tr>
<td>Blood</td>
<td>- Chlorine - Hydrogen chloride - Phosgene - Hydrocyanic acid (HCN)</td>
<td></td>
<td>- Pungent odor - Odorless and non-irritating substance</td>
</tr>
<tr>
<td>Chemical</td>
<td>- Phosgene oxime (CX) - Hydrocyanic acid oxime (H-CX) - Lewisite oxime (LOX) - Atropine</td>
<td></td>
<td>- Specific antidote (physostigmine) may be available</td>
</tr>
<tr>
<td>Vesicant</td>
<td>- Mustard (HD) - Lewisite (L) - Lewisite oxime (LOX) - Lewisite oxime (LOX) - Mustard gas (H) - Nitrogen mustard (HN-1, HN-2, HN-3)</td>
<td>- Severe irritation - Redness and blisters of the skin - Tearing, conjunctivitis, corneal damage</td>
<td>- For cyanide, use antidotes (sodium nitrite and then sodium thiosulfate)</td>
</tr>
</tbody>
</table>

*Frostbite may occur from skin contact with liquid arsine, cyanogen chloride or phosgene.

#### Table 2. Decontamination and Treatment

<table>
<thead>
<tr>
<th>Agent Type</th>
<th>Decontamination</th>
<th>First Aid</th>
<th>Other Patient Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphyxiant/Choking</td>
<td>- Immediately decontaminate skin - Flush eyes with water or normal saline for 10-15 minutes</td>
<td>- For cyanide, use antidotes (sodium nitrite and then sodium thiosulfate)</td>
<td>- Evaluate mental status - Use restraints as needed - Monitor core temperature</td>
</tr>
<tr>
<td>Blood</td>
<td>- Remove clothing immediately if no frostbite* - Gently wash skin with soap and water</td>
<td>- Do not abrade skin - For eyes, flush with plenty of water</td>
<td>- Other supportive therapy, as needed</td>
</tr>
<tr>
<td>Chemical</td>
<td>- Flush eyes with water or normal saline for 10-15 minutes</td>
<td>- Hyperthermia and self-injury are largest risks</td>
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</tr>
<tr>
<td>Vesicant</td>
<td>- Immediately decontaminate skin - Flush eyes with water or normal saline</td>
<td>- Specific antidote British Anti-Lewisite (BAL) - Phosgene oxime causes immediate pain - If breathing difficulty, give oxygen</td>
<td>- Specific antidote (physostigmine) may be available</td>
</tr>
</tbody>
</table>

*Frostbite may occur from skin contact with liquid arsine, cyanogen chloride or phosgene.
include localized sweating, muscle fasciculations, nausea, vomiting, and altered level of consciousness.

2. PPE to Prevent Eye Exposure:

a. Standard PPE is not sufficient for protection against nerve agents. In addition, PPE designed to protect against biological agents and tear gas may be inadequate as an alternative to PPE designed for nerve agents.

b. The use of eye wash stations may not be appropriate (eye wash stations are not regulated or calibrated).

c. A 15- to 20-minute water rinse of the affected eye(s) followed by gentle and thorough washing with soap and water is recommended if splash injury occurs.

3. PPE to Prevent Inhalation Exposure:

a. In general, cold weather conditions may help to reduce the effects of nerve agents. However, the effects of nerve agents may be more pronounced in cold conditions due to decreased metabolic activity.

b. The use of positive air-purifying respirators (PAPR) and self-contained breathing apparatus (SCBA) is recommended when working in areas where nerve agents may be present.

4. PPE to Prevent Exposure to Chemicals:

a. The use of PPE designed to protect against nerve agents is recommended when working in areas where nerve agents may be present.

b. The use of PPE designed to protect against chemical agents is recommended when working in areas where chemical agents may be present.

c. The use of PPE designed to protect against biological agents is recommended when working in areas where biological agents may be present.

5. PPE to Prevent Decontamination:

a. The use of PPE designed to protect against nerve agents is recommended when working in areas where nerve agents may be present.

b. The use of PPE designed to protect against chemical agents is recommended when working in areas where chemical agents may be present.

c. The use of PPE designed to protect against biological agents is recommended when working in areas where biological agents may be present.

6. PPE to Prevent Exposure to Chemicals:

a. The use of PPE designed to protect against nerve agents is recommended when working in areas where nerve agents may be present.

b. The use of PPE designed to protect against chemical agents is recommended when working in areas where chemical agents may be present.

c. The use of PPE designed to protect against biological agents is recommended when working in areas where biological agents may be present.

7. PPE to Prevent Decontamination:

a. The use of PPE designed to protect against nerve agents is recommended when working in areas where nerve agents may be present.

b. The use of PPE designed to protect against chemical agents is recommended when working in areas where chemical agents may be present.

c. The use of PPE designed to protect against biological agents is recommended when working in areas where biological agents may be present.

8. PPE to Prevent Exposure to Chemicals:

a. The use of PPE designed to protect against nerve agents is recommended when working in areas where nerve agents may be present.

b. The use of PPE designed to protect against chemical agents is recommended when working in areas where chemical agents may be present.

c. The use of PPE designed to protect against biological agents is recommended when working in areas where biological agents may be present.

9. PPE to Prevent Decontamination:

a. The use of PPE designed to protect against nerve agents is recommended when working in areas where nerve agents may be present.

b. The use of PPE designed to protect against chemical agents is recommended when working in areas where chemical agents may be present.

c. The use of PPE designed to protect against biological agents is recommended when working in areas where biological agents may be present.

10. PPE to Prevent Exposure to Chemicals:

a. The use of PPE designed to protect against nerve agents is recommended when working in areas where nerve agents may be present.

b. The use of PPE designed to protect against chemical agents is recommended when working in areas where chemical agents may be present.

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