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## Pepper Spray (Aerosolized Capsaicin)

### **Background:**

Pepper spray contains capsaicin and related capsaicinoids, chemicals derived from chili pepper (*Capsicum spp.*). Capsaicin causes extreme irritation and pain by activating the neurons involved in the sensation of pain and heat. The effects of this riot control agent are due to capsaicin's ability to irritate the skin, eyes, and respiratory tract.

There are multiple formulations. The spray contains oleoresin capsaicin in a water- or oil- (and sometimes alcohol-) based solvent. Most are aerosols, but some are gel formulations and some contain dyes that can cause cutaneous staining. Bear sprays and related products are wildlife deterrents that can contain higher concentrations of capsaicin (e.g. >2%) and can cause more severe symptoms. Most pepper sprays intended for canine and human use have <1.5% capsaicin per volume.

Almost all patients do well with decontamination and time (the effects wear off over time). Patients with underlying pulmonary disease, such as asthma, COPD, chronic bronchitis, or reactive airways, are at greater risk for respiratory toxicity after exposure to aerosolized capsaicin.

### **Clinical Signs and Symptoms:**

- 1) Eyes: Burning or stinging pain, tearing, redness. Patients with prolonged pain or visual changes should be evaluated for a corneal abrasion.
- 2) Nose: Burning pain and runny nose
- 3) Respiratory: Cough, wheezing, bronchospasm and shortness of breath.  
Pneumomediastinum has been described from the forceful coughing secondary to pepper spray exposure.

### **Treatment:**

#### **Decontamination:**

- 1) Remove clothing that may be contaminated with the capsaicin
- 2) Skin decontamination: Copious irrigation with cold water.
- 3) Ocular decontamination: Copious irrigation with water. May need evaluation for corneal abrasion if persistent pain is present.

#### **Supportive Care:**

- 1) Skin: Some studies suggest that pain may be rapidly decreased in the first 30 minutes by the application of magnesium-aluminum hydroxide (Maalox) soaked dressings on affected area after decontamination. There is no difference in pain between simple decontamination and further Maalox treatment at 60 to 90 minutes post exposure.
- 2) Eyes: Remove contacts. Decontaminate with cold water irrigation, evaluate for corneal abrasion if persistent pain. Alcohol based sprays can cause more severe corneal damage. Treat with ophthalmic antibiotics as findings indicate.
- 3) Respiratory:
  - a. Treat bronchospasm and manage airway as indicated.



**Disposition:**

The vast majority of exposed individuals will improve after removal from exposure and decontamination. Most can self-decontaminate and no further treatment will be needed.

Medical treatment is often not sought and most patients who present to a healthcare facility may be discharged home when asymptomatic. Admit patients with prolonged respiratory signs and symptoms that fail to clear.