

### **CHLORINE: Health Care Information**

Chlorine is a denser-than-air green gas used in chemical manufacturing and as a bleaching agent. Hypochlorite is an aqueous solution that is used as a disinfectant and in swimming pools. Chloramine is a gas that is released when ammonia is added to hypochlorite, and its effects are similar to those of chlorine. Chlorine is a moderately water-soluble irritant gas that produces a corrosive solution (hydrochloric acid and oxygen radicals) on contact with skin or mucous membranes. Any of these agents may be released accidentally (the addition of acid or ammonia to hypochlorite leads to chlorine gas, or chloramine gas, respectively) or by intentional rupture of a holding tank at a factory, port or rail car.

**Recognition and Triage:** Chlorine gas may produce immediate or **delayed** (several hours, depending on concentration) **irritation of the skin and mucous membranes (pharyngitis, rhinitis, conjunctivitis)**. High Concentration or prolonged exposure may lead to **upper airway swelling, stridor, cough and pneumonitis**. Patients may be triaged as follows: (**immediate**) respiration >30/minute or upper airway edema; (**delayed**) mild mucosal irritation; (**minor**) asymptomatic (minor patients must be observed for delayed symptoms).

**Personal Protective Equipment (PPE) (at the health care site):** Personnel who decontaminate patients should wear splash-proof PPE (waterproof outer garment and chemical resistant gloves) and a filtered air respirator. Personnel treating decontaminated patients require no PPE other than universal precautions.

**Decontamination (at the health care site):** Sufficient decontamination includes removal of **ALL** clothing and jewelry and thorough washing of the skin and hair with water for 3 to 5 minutes.

**Diagnosis and Treatment:** Treatment is supportive. **Decontaminate** any exposed skin with copious water. Exposed or painful eyes should be flushed with 1 to 2 liters of water or normal saline, then continue flushing until the ophthalmic pH is between 7 and 8. An ophthalmic anesthetic can be used prior to flushing. **Oxygen** may be required for hypoxemia. **Early intubation should be considered for upper airway swelling or severe pneumonitis with impaired oxygen exchange.** **Bronchodilators** (e.g., albuterol) may be used for wheezing or cough. Contact the Poison Center (1 800 222 1222) for specific questions or advice on individual patients.

**Patient Monitoring:** Chlorine has no systemic effects. Continuous monitoring of pulse oximetry and end-tidal carbon dioxide may help assess oxygen exchange; however, patients with impending airway obstruction should be intubated early.

**Disposition Criteria (when to send patient home):** Initial mild symptoms may progress to corneal opacity, airway obstruction and pneumonitis. Patients with significant ocular or airway irritation should not be discharged. Patients with mild or no symptoms should be observed for a 4-hour period. If symptoms are gone or mild after 4 hours and pulse oximeter is normal, patients may be discharged with instructions to return if symptoms worsen.

**Reporting/Coordination Link:** Call the **Poison Center (1 800 222 1222)** for information on specific patients. Contact the local or state public health authority (**Oregon Public Health Hotline: 1 800 805 2313**) to report a mass casualty incident.