

Chemical Type	Signs and Symptoms	Medical Treatment Summary	Useful Labs
<p><b>Nerve Agents:</b> sarin, tabun, soman, VX, organophosphate and methylcarbamate pesticides.</p> <p><b>Immediate decontamination is critical to prevent further exposure to patient and health care workers.</b> Onset: Vapor—seconds to minutes. Liquid—minutes to hours</p>	<p><b>Note:</b> Not all signs need to be present.</p> <p><i>Muscarinic:</i> diaphoresis, salivation, nausea, abdominal cramps, vomiting, diarrhea, urination, lacrimation, miosis, blurred vision, bradycardia, bronchorrhea, dyspnea, chest tightness.</p> <p><i>Nicotinic:</i> fasciculations, muscular weakness, muscle paralysis, hypertension, tachycardia.</p> <p><i>CNS:</i> confusion, restlessness, anxiety, ataxia, headaches, fatigue, loss of consciousness, respiratory depression, seizures, coma.</p> <p><i>Note:</i> children may exhibit different symptoms (CNS, stupor, flaccidity, dyspnea).</p>	<p><b>Inhalation and dermal absorption</b> Treatment must counteract cholinergic excess in all three receptor sites. Maintain ventilation, oxygenation, ABCs.</p> <p><b>Antidotes:</b> <b>Atropine sulfate</b> for hypersecretions, pulmonary edema, or bradycardia. Parenteral atropine should not be used to control rhinorrhea or to treat miosis. <b>Adult:</b> 1–2 mg IV/IM initial dose. 1–2 mg IV/IM may be continued q 5–10 mins. until bronchial secretions are dried, bradycardia resolved. If symptoms return, repeat dosing. <b>Pediatric:</b> 0.02 mg/kg IV (IM okay if no IV access); use at least 0.1 mg; not to exceed adult dose q 5 to 60 mins until symptoms subside (bronchosecretions dry; bradycardia resolved); if symptoms return, repeat dosing scheme. <b>Pralidoxime (2-PAM)</b> for muscle weakness, fasciculations, severe toxicity. <b>Adult:</b> 1–2 g. IV or IM. IV dose can be mixed in 100 mL NS and infused over 15–30 mins. If symptoms recur or continue, repeat dose in one hour or start continuous infusion at 200-500 mg/hour. <b>Pediatric:</b> 25 to 50 mg/kg up to 1 g IV or IM. IV dose can be infused over 15 –30 mins. If symptoms recur or continue, repeat dose in one hour or start continuous infusion at 5–10 mg/kg/hr. May repeat in 1 hour if weakness not resolved, then again every 6 hours, or by continuous IV infusion at 5–10 mg/kg/hr. <b>Diazepam or equivalent</b> dosing of another Benzodiazepine for seizures, agitation: <b>Adult:</b> 5–10 mg IV/ IM. <b>Pediatric:</b> 0.1 mg/kg IV/ IM</p>	<p>Treat patient immediately. Do not wait for laboratory confirmation.</p> <p>Plasma pseudocholinesterase and red blood cell acetylcholinesterase for organophosphate and methyl carbamate chemicals.</p>
<p><b>Systemic Asphyxiants:</b> cyanides, sulfides, azides.</p> <p><b>Rapid decontamination.</b> Onset: Cyanides—seconds.</p>	<p>Headaches, dizziness, nausea, vomiting, drowsiness, hallucinations, gasping for air, loss of consciousness, brady/tachycardia, seizures, respiratory/cardiac arrest.</p> <p>Liquid cyanogen chloride may cause eye and respiratory tract irritation and chemical burns on exposed skin.</p>	<p><b>Inhalation and dermal absorption</b> Maintain ventilation, oxygenation, ABC's.</p> <p><b>Cyanide: Cyanide Antidote Kit</b> <b>Adult:</b> 10 mL of 3% sodium nitrite solution (300 mg) IV over 3 minutes; followed by sodium thiosulfate 12.5 grams IV (50 mL of a 25% solution), over 10 to 20 min. <b>Pediatric:</b> 0.33 mL/kg of 10% sodium nitrite IV (10 mg/kg) over 3 to 5 mins. followed by 1.65 mL/kg of 25% sodium thiosulfate (400 mg/kg) over 10 mins. <b>Other asphyxiants:</b> No antidote; provide supportive care. <b>Supportive:</b> oxygen, correct acidosis, treat eye and skin injuries as for burns.</p>	<p>Cyanide: high anion gap metabolic acidosis, elevated lactate methemoglobin, and urinary thiocyanate levels.</p>
<p><b>Vesicants:</b> sulfur and nitrogen mustards, Lewisite, phosgene oxime</p> <p><b>Rapid decontamination</b> Onset: Lewisite—immediate Mustard—effects may be delayed 2–24 hours. Phosgene oxime—immediate</p>	<p>Pain initially, followed by erythema, blisters, and a chemical burn, severe itching, necrosis. Mustards produce groups of small blisters over erythematous areas. Lewisite blisters expand, taking up to 4 days to cover entire erythematous areas. Conjunctivitis, corneal opacity, blepharitis. Dry cough, nose, throat, lung irritation to marked airway damage. Epistaxis. Nausea, vomiting, diarrhea, abdominal pain, hyperexcitability, convulsions.</p>	<p><b>Inhalation and dermal absorption</b> <b>No antidotes.</b> Maintain ventilation, oxygenation, ABC's, eye and burn care. May consider using topical BAL.</p>	<p>Leukocytosis during first day of exposure. Chemical pneumonitis within first 2 to 3 days after inhalation exposure. Thiodiglycol urinary metabolite of sulfur mustard. Urinary speciated arsenic to identify Lewisite.</p>
<p><b>Pulmonary Irritants:</b> ammonia, chlorine, hydrogen fluoride, oxides of nitrogen, phosgene.</p> <p><b>Rapid decontamination.</b> Onset: Immediate. Phosgene can be delayed 24 hours.</p>	<p>Eye and airway irritation, dyspnea, chest tightness, rapid breathing, coughing, wheezing, rales, hemoptysis, stridor, frothy secretions (2–24 hrs), cyanosis, upper airway swelling, pulmonary edema, lung collapse; tachycardia, initial hypertension, hypotension, possible cardiovascular collapse; nausea, vomiting; skin burns, blisters.</p>	<p><b>Inhalation</b> <b>No antidotes.</b> Manage secretions, maintain ventilation, oxygenation, monitor heart, renal, liver functions. Treat pulmonary edema with PEEP to maintain PO<sub>2</sub> above 60 mm Hg. <b>Hydrogen fluoride:</b> Pneumonitis from inhaled HF may be treated with oxygen and nebulized 2.5% calcium gluconate (mix 1.5 mL of 10% calcium gluconate with 4.5 mL sterile water). <b>Skin burns</b> may be treated with topical calcium gluconate. <b>Do not inject or use calcium chloride for treating skin burns.</b> For hydrogen fluoride systemic toxicity, serum calcium, magnesium and potassium levels must be rapidly corrected with IV boluses of calcium gluconate and magnesium sulfate.</p>	<p>Hydrogen fluoride: EKG and serum potassium, calcium and magnesium concentrations q30 min until stable. No laboratory tests for other pulmonary irritants.</p>
<p><b>Lacrimators/Riot Control:</b> CN, CS tear gas, chloropicrin.</p> <p><b>Rapid decontamination.</b> Onset: Seconds.</p>	<p>Eye, nose, throat, respiratory tract irritation, tearing, rhinorrhea, sneezing, coughing, bronchospasm, wheezing, vomiting, pulmonary edema, skin burning sensation, erythema. High concentrations—chemical skin burns. Exposure in confined spaces—severe airway damage possible. Particles can get embedded in cornea or conjunctiva to cause tissue damage.</p>	<p><b>No specific therapy.</b> Eye flushing, remove particles. Ophthalmic exam.</p>	<p>No laboratory tests.</p>

**Please obtain treatment information from the Oregon Poison Center 503.494.8968 or 800.222.1222**